

# Deriving the CSC and Unifying ATB and PG Constructions through Sideward Movement

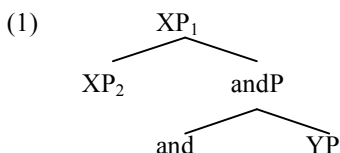
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## 1. Introduction

In this paper I argue that the analysis coordinate and subordinate structures should be unified in terms of their syntax. More specifically, I argue that in coordinate structures in which two TPs are coordinated, the second conjunct is adjoined to the vP, as it is commonly assumed for subordinate structures. If this is correct we will find a redundancy between The Coordinate Structure Constraint (CSC) and the Condition on Extraction Domains (CED). I actually argue here that the former is an epiphenomenon and that extraction from the first conjunct and extraction from the second conjunct are banned by different principles. Finally, I argue that the analysis of Across-the-Board (ATB) and Parasitic Gap (PG) constructions should be unified in terms of Sideward Movement (Nunes 1995, 2004; Hornstein & Nunes 2002), for which I will provide further evidence here.

## 2. Lowering the adjunction site of the second conjunct

I adopt here the basic idea of Munn's (1993) analysis of coordination, under which the second conjunct is adjoined to the first one, as shown in (1):



Even though Munn's analysis overcomes many of the problems that the X' analysis of coordination (see e.g. Kayne 1994) faces, it is not clear how it can account for the Condition C effects in (2):

- (2) a. \*He<sub>i</sub> bought the book and John<sub>i</sub> liked it.  
b. His<sub>i</sub> best friend bought the book and John<sub>i</sub> liked it.

Given the contrast illustrated in (2), it appears that the subject of the first conjunct c-commands into the second conjunct, yielding a Condition C violation when both subjects are co-referential. One possibility is that in the case of TP coordination, the second conjunct adjoins to a position lower than the TP.

Interestingly, the condition C effects in (2) mirror what happens in the case of adverbial (subordinate) clauses, which are assumed to adjoin to vP (VP in the case of unaccusatives and passives), as illustrated in (3):

- (3) a. \*He<sub>i</sub> <sub>VP</sub>[<sub>VP</sub>[bought the book] <sub>CP</sub>[after John<sub>i</sub> read it]]  
b. His<sub>i</sub> best friend <sub>VP</sub>[<sub>VP</sub>[bought the book] <sub>CP</sub>[after John<sub>i</sub> read it]]

In the light of the evidence just presented I hypothesize (4):

- (4) Conjoined TPs and adverbial clauses adjoin to the same syntactic category, namely vP.

One consequence of this approach is that any differences in the behavior of second conjuncts vs. adverbial clauses (i.e., coordination vs. subordination) have to be explained in other terms and it is also possible that some differences are actually due to lexical properties of coordinating vs. subordinating conjunctions, or even lexical differences within these conjunction classes.

One example of this different behavior would be availability of fronting. One traditional distinction between coordination and subordination is that an adverbial clause can be fronted, while a second conjunct cannot:

- (5) a. [Because John was tired]<sub>i</sub> the party ended really early  $t_i$   
 b. \*[And we went home]<sub>i</sub> the party ended really early  $t_i$

This is not universally true, however. In Spanish and Galician, for example, the subordinating conjunctions *porque* and *que* are synonymous, yet only the former can be fronted (the Spanish examples below involve clefting). This contrast also applies in French (Chris Collins, personal communication).

- (6) a. Me voy    porque    estoy cansado  
       leave.1sg    because    am    tired
- b. Me voy    que    estoy cansado  
       leave.1sg    that    am    tired  
       ‘I’m leaving because I’m tired’
- c. Es            porque    estoy cansado    que    me voy  
       Is            because    am    tired            that    leave.1sg
- d. \*Es que    estoy cansado    que    me voy  
       Is that    am    tired            that    leave.1sg  
       ‘It’s because I’m tired that I’m leaving’

Availability of fronting, then, doesn’t seem to be a reliable diagnostic for determining coordination vs. subordination status but depends on intrinsic lexical properties of different conjunctions.

### 3. On the nature of the CSC

#### 3.1 Partial redundancy with the CED

One important consequence of any adjunction approach to coordination is that extraction from the second conjunct is independently ruled out by the Condition on Extraction Domains (CED), which disallows extraction from specifiers and adjuncts.

Thus, (7a) below would already be ruled out by the same mechanism that disallows (7b):

- (7) a. \*I wonder [which book]<sub>i</sub> Mary read a magazine **and Peter bought**  $t_i$   
 b. \*I wonder [which book]<sub>i</sub> Mary read a magazine **after buying**  $t_i$

Under these assumptions, then, we have an undesirable redundancy in the system; extraction out of a second conjunct is ruled out by two different principles: the CED and the CSC. As Minimalism seeks to explore syntactic relations and the constraints applying to them without resorting to construction-specific constraints, the CED is obviously the preferred explanation for these phenomena.

Questions arise now regarding the status of the CSC. One possibility is to redefine it as something like the “First Conjunct Constraint”, as in (8):

(8) No extraction is possible from a First Conjunct.

The problem with (8) is that it is still (probably even more) construction-specific. Again, the question is whether we can implement a more Minimalist version of (8) and get rid of the CSC altogether. Can we then account for why extraction from the first conjunct is also disallowed by appealing to some other independently motivated mechanism of the grammar?

### 3.2 On the parallelism requirement

In this section I argue that we can deduce the CSC if we adopt a version of Hornstein and Nunes’ (2002) account of the main differences between ATB and PG constructions under a Sideward Movement approach. Hornstein and Nunes argue that ATB constructions, unlike PG ones, obey a parallelism requirement. This is illustrated in the examples in (9):

(9) a. I wonder [which paper]<sub>i</sub> you read  $t_i$  and Mary recommended  $t_i$  /\*[this book]?

b. I wonder [which paper]<sub>i</sub> you read  $t_i$  after Mary recommended  $t_i$  /[this book]?

Hornstein and Nunes adopt the standard hypothesis (which I will revise later) that coordinate structures impose some kind of parallelism restriction, which has been formalized in different ways in the literature (e.g., into the ATB formalism itself (Williams 1978), as a semantic restriction (Munn 1993), etc.). Hornstein and Nunes formalize this parallelism in terms of a legibility condition at the C/I Interface.

As far as the narrow syntax is concerned then, there is nothing wrong with extracting an element out of the first conjunct under the analysis I propose here; that is, the first conjunct, unlike the second one, *is not an island*. What is wrong is a resulting LF-representation in which an element has been extracted from the first conjunct whose parallel in the second conjunct has *not* been extracted, which follows independently from the parallelism requirement.

If this is on the right track, we reach the (non-trivial) conclusions in (10):

(10)a. The ban on extraction from a second conjunct is derivational, i.e., is a constraint on the *movement* operation.

b. The ban on extraction from a first conjunct is representational, i.e., is a constraint on the *output* of the derivation.

Interestingly, there is actually evidence that this parallelism requirement in ATB constructions goes beyond legibility at the C/I interface. Consider the Spanish data in (11) below (similar effects can be observed in other Romance languages, such as Catalan or Galician):

(11) ¿A qué empresario pudo invitar la secretaria ayer y saludar el jefe hoy?  
Which businessman could invite the secretary yesterday and greet the boss today

(12) ?¿A qué empresario pudo invitar la secretaria ayer y el jefe saludar hoy?  
Which businessman could invite the secretary yesterday and the boss greet today

(13) ¿A qué empresario pudo la secretaria invitar ayer y el jefe saludar hoy?  
Which businessman could the secretary invite yesterday and the boss greet today

(14) ??¿A qué empresario pudo la secretaria invitar ayer y saludar el jefe hoy  
Which businessman could the secretary invite yesterday and greet the boss today  
‘Which businessman could the secretary invite yesterday and the boss greet today?’

As can be seen, (11) and (13), in which the relative order of verb and subject is the same in the first and second conjuncts, are grammatical, while (12) and (14), in which that relative order has not been preserved, are degraded.

More interesting contrasts arise if we consider cases with null subjects:

- (15) ?¿A quién pudieron *pro* invitar y [la secretaria] saludar?  
Whom could.3pl invite and the secretary greet
- (16) \*¿A quién pudieron *pro* invitar y saludar [la secretaria]?  
Whom could.3pl invite and greet the secretary  
'Who could they invite and the secretary greet?'

As can be seen in (15) and (16), when the subject of the first conjunct is null, the subject of the second conjunct has to be preverbal. Assuming that null subjects in finite clauses (*pro*) are licensed only in Spec-TP (see Fernández-Salgueiro 2005 and references therein), it is also the case that grammaticality in these cases obtains only when the relative order of subject and verb is preserved.

The data above suggest that the parallelism requirement on the two conjuncts is not only of a semantic, C/I interface-related nature, but is also operative in the A/P interface, imposing certain word order restrictions.

Provided that the parallelism requirement is unavoidable, given the differences between ATB and PG constructions and the contrasts just discussed, the construction-specific notion of a CSC can be done away with in Minimalism without losing empirical coverage.

Questions arise regarding the scope of this parallelism requirement, however. Interestingly, there are other examples of ATB extraction in Romance in which it doesn't seem to apply. Consider the Spanish example in (17):

- (17) ¿[Qué libro]  $t_i$  sorprendió a Juan y está ahora leyendo  $t_i$  María?  
Which book surprised John and is now reading Mary  
'Which is the x, x a book, such that x surprised John and Mary is reading x now'

The main difference between (17) and the other examples just discussed is that the second conjunct in this example has independent Tense, which suggests that (17) is a case of CP (rather than TP) coordination, under the assumption that Tense is defective unless selected by C (see Chomsky 2001). If this is on the right track, it's not really second conjuncts that are subject to Parallelism, but actually a conjunct whose Tense interpretation is parasitic on the matrix Tense.

This is a welcome result, since the Parallelism requirement, as understood by Hornstein and Nunes, is *still* construction-specific in that it only applies to one construction, and hence is theoretically undesirable in Minimalism. The research question that arises then is: why do TPs without independent Tense need to be parallel with respect to the clause they adjoin to?

Investigating why exactly this is the case is something that I leave for further research.

#### 4. On the unification of ATB and PG constructions

Another important consequence of the adjunction analysis of coordination that I entertain here is that ATB and PG constructions have the exact same syntactic structure. This means that a unified analysis of the two kinds of constructions not only is desirable but actually unavoidable.

Here I am assuming and providing further evidence for a Sideward Movement analysis for these two constructions (Nunes 1995, 2004), in which a *wh*-phrase inside the adjoined phrase is copied and merged with the lexical verb of the main clause *before* the adjunct is attached. As Nunes points out, this relative timing of Copy+Merge and adjunct attachment is what allows extraction out of an adjunct "island".

Notice that a null operator analysis also overcomes this problem, since the movement of the null operator does not cross an island (it just moves to the island's edge). In Section 4.2 I will present some problems with the null operator analysis.

#### 4.1 Sideward Movement: avoiding Weak Crossover effects

In this section I argue that Weak Crossover (WCO) effects favor a Sideward Movement analysis over other approaches, assuming that WCO is a constraint *on the syntactic operation* (see Postal 1971, *contra* Koopman and Sportiche 1982).

Consider the classic WCO contrast in (18):

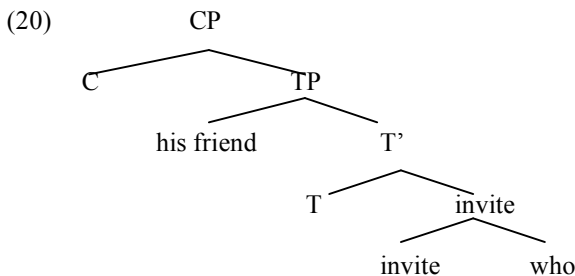
- (18) a. Who<sub>i</sub> invited his<sub>i</sub> friend to the party?  
 b. \*Who<sub>i</sub> did his<sub>i</sub> friend invite to the party?

Postal's original account claimed that the ungrammaticality of (18b) is due to the fact that movement of *who* literally crosses a co-indexed element, while that is not the case in (18a). I will follow the basic idea of this approach here, and attempt to state a WCO principle in a way that relates a syntactic operation of movement with the resulting linear order. It turns out that Minimalism offers an interesting way of formalizing "crossing" in these terms, if we assume a strong derivational approach under which interpretation at the interfaces proceeds derivationally (Epstein et al. 1998, Epstein and Seely 2006; see also Pesetsky and Fox's (2005) cyclic approach to Linearization).

First of all, let's assume (19):

- (19) Each operation of Merge provides a set of instructions to the PF and LF components (including linear order information).

If this is true, at the point in the derivation in (20) (i.e., after merger of the Comp head),



the following linear order is computed by PF:

- (21) PF = <did, his, friend, invite, who>

Also, the LF component has also assigned a semantic interpretation to (20). Since *his* doesn't c-command *who*, *his* and *who* can co-refer (cf. his<sub>i</sub> best friend likes John<sub>i</sub>).

If the co-referent semantic interpretation is assigned and *who* were now to move to Spec-CP, the following linear order would be computed:

- (22) PF = <**who**, did, **his**, friend, invite, (**who**)>

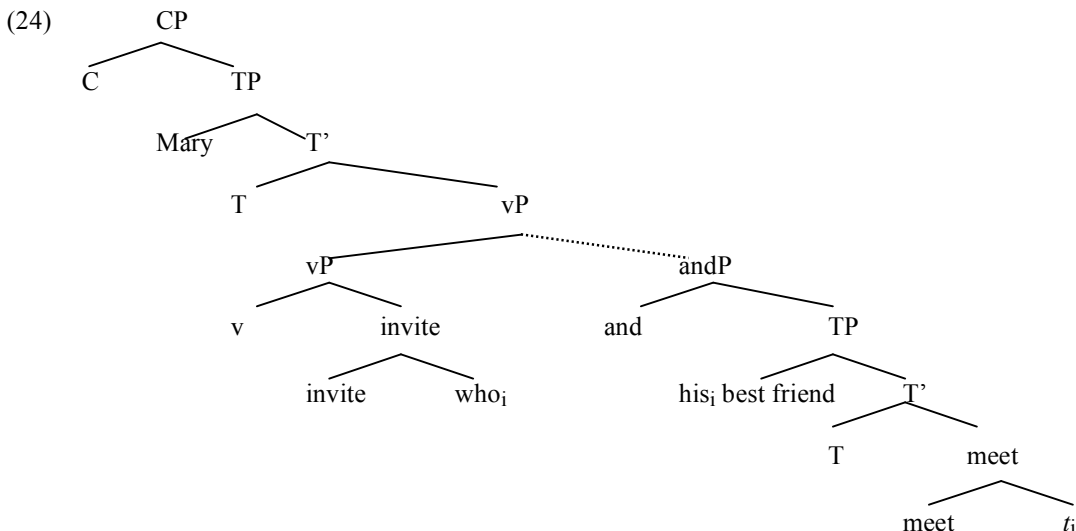
and *who* would cross *his*, with which *who* is interpreted as co-referent at LF.

Consider now the data in (23) (see also Lasnik & Stowell 1991, Citko 2005), which shows that WCO effects are absent in the second conjunct/adverbial clause (yet present in the first conjunct/main clause).

- (23) a. Who should Mary invite  $t_i$  and his<sub>i</sub> best friend meet  $t_i$ ?  
 b. \*Who should his<sub>i</sub> best friend invite  $t_i$  and Mary meet  $t_i$ ?

- c. Who should Mary invite  $t_i$  before his<sub>i</sub> best friend meets  $t_i$ ?
- d. \*Who should his<sub>i</sub> best friend invite  $t_i$  before Mary meets  $t_i$ ?

Under the Sideward Movement approach, *who* is copied from the object position of *meet* and merged with *invite*, as shown in (24), *before* andP adjoins to vP (for the sentence in (23a)):



This Sideward Movement of *who* does not cross a co-indexed pronoun, since this movement is to an unrelated syntactic object (recall that *who* moves out of andP before it becomes an adjunct). Moreover, when *who* moves further to Spec-CP, no crossing occurs either, since the linear order computed by PF at that point is (25):

(25) PF = <who, did, Mary, invite, (who), and, his, best, friend, meet, (who)>

This asymmetry in WCO effects between the first conjunct and the second conjunct are not easy to explain under a multidominance/parallel Merge analysis of ATB (Citko 2005), under which the movement of the wh-phrase would cross a co-indexed pronoun both in the first conjunct and in the second conjunct.

These WCO effects are also problematic for a deletion approach to ATB constructions (see An forthcoming and references therein), in which the elements in the CP domain of the second conjunct delete under identity with the first conjunct, as sketched in (26):

(26) [Who does John like] and [~~who does~~ Mary dislike]

#### 4.2 Null operators and WCO

Under a null operator analysis of ATB and PG constructions (Munn 1993), we would have to stipulate that only null operators can “escape” WCO effects. In this respect, Lasnik and Stowell (1991) actually argue that null operators do not give rise to WCO effects (hence the name *Weakest Cross Over*) in constructions such as topicalization, cleft sentences, *tough*-movement, and relative clauses.

However, in the constructions where we do not find WCO effects with null operators, these effects are also absent with overt phrases. This can be illustrated with relative clauses, in which both overt and null operators are possible, as shown in (27):

(27) This is [the employee]<sub>i</sub> who<sub>i</sub>/*Op*<sub>i</sub> his boss couldn’t stand  $t_i$

This example provides evidence that the absence of WCO effects is not due to special properties of the null operator. Rather, the absence of WCO effects seems to be a property of these constructions. One possibility is that what these constructions have in common is that they actually also involve Sideward Movement, and thus avoid WCO in the same way ATB and PG constructions do under the account presented here.

## 5. Conclusions

In this paper I have provided evidence that in coordinate structures in which two TPs are coordinated, the second conjunct is adjoined to the vP. I have also argued that the CSC is an epiphenomenon and can be reduced to two other independent principles of the grammar; one derivational (islandhood), blocking extraction from the second conjunct, and the other representational (parallelism at the interface), blocking (the output of) extraction from the first conjunct. Finally, I have also provided further support for a unified analysis of ATB and PG constructions in terms of Sideward Movement that accounts for the thus far asymmetry between conjuncts regarding WCO effects.

## References

- An, Duk-Ho. In press. "Asymmetric T-to-C Movement in ATB Constructions: A PF Deletion Analysis." *Proceedings of the 14th Annual Conference of the Student Organization of Linguistics in Europe*.
- Citko, Barbara. 2005. "On the Nature of Merge: External Merge, Internal Merge, and Parallel Merge." *Linguistic Inquiry* 36:475-496.
- Epstein, Samuel, Erich Groat, Hisatsugu Kitahara & Ruriko Kawashima. *A Derivational Approach to Syntactic Relations*. Oxford: Oxford University Press.
- Hornstein, Norbert & Jairo Nunes. 2002. "On Asymmetries between Parasitic Gap and Across-the-Board Constructions." *Syntax* 5,1:26-54.
- Lasnik, Howard & Tim Stowell. 1991. "Weakest crossover." *Linguistic Inquiry* 22:687-720.
- Munn, Alan. 1993. *Topics in the Syntax and Semantics of Coordinate Structures*. Doctoral dissertation. University of Maryland, College Park.
- Nunes, Jairo. 1995. *The Copy Theory of Movement and Linearization of Chains in the Minimalist Program*. Doctoral dissertation, University of Maryland, College Park.
- Nunes, Jairo. 2004. *Linearization of Chains and Sideward Movement*. Cambridge, MA: MIT Press.
- Postal, Paul M. 1971. *Crossover Phenomena*. New York, NY: Holt, Rinehart and Winston.

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