

Constituency and left-sharing in coordination

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Abstract

A long-standing assumption in the syntactic literature is that coordination can only target constituents. This assumption has been the subject of much debate, especially in the last two decades, with many authors questioning its validity, often to criticize assumptions about constituency and structure in frameworks like Generative Syntax. This paper enters this debate by reconsidering a constraint on left-sharing in coordination which Osborne and Gross (2017) have recently introduced (**The merchant of [Venice was broke] and [Verona was rich]*), and which they call left node blocking (LNB). To account for LNB, O&G propose the Principle of Full Clusivity (PFC) which states that coordination cannot cut into a constituent, assuming that coordination does not have to conjoin constituents and that syntactic structures should be flat. Presenting evidence that coordination must target constituents, I argue that LNB is captured by general constraints on movement, ellipsis, or selection; thus, a construction-specific principle such as the PFC is redundant, and the claim that LNB argues for flat syntactic structures becomes untenable. LNB can be perfectly captured by a grammar that assumes binary-branching structures, and it provides evidence for the generalization that coordination can only operate on constituents.

Keywords: coordination, constituency, structure, left node blocking, ellipsis, movement

1 Introduction

It has long been known that coordination can only target constituents, and, therefore, is considered to be a reliable constituency test. This assumption has been the center of much debate since the earliest days of syntactic theorizing. This paper enters this debate by reconsidering a constraint on left-sharing in coordination, which has recently been introduced by Osborne and Gross (2017) (O&G hereafter), as exemplified in (1).

- (1) a. * The man [who built the rocket has] and [who studied robots designed] a dog. (Phillips, 2003, 49, (22a))
b. * Before [school I study] and [work I sleep]. (Osborne and Gross, 2017, 654, (15c))
c. * Susan repairs old [bicycles in the winter] and [cars in the summer]. (Osborne, 2008, 1140)

The examples in (1) show that certain cases of left-sharing in coordination are barred by the grammar. O&G dub this phenomenon *left node blocking* (LNB), and to account for it, they propose the Principle of Full Clusivity (PFC), which states that left-sharing is blocked if coordination cuts into a constituent (constituents underlined, following O&G). O&G further argue that the PFC makes the right predictions if coordination operates on non-constituent strings, and if syntactic structures are less layered (i.e., flat).

Presenting evidence that coordination must operate on constituents, I argue that the cases of illicit left-sharing in coordination are ruled out by general constraints on movement, ellipsis or selection. Hence, a construction-specific principle such as the PFC is redundant, and consequently, the claim that LNB and the PFC argue for flat syntactic structures becomes untenable. I begin by presenting the claims made by O&G about left-sharing in coordination in section 2. In section 3, I address a major assumption in O&G's analysis, namely that coordination does not have to operate on constituents. I show that coordination targets constituents, even in the cases where it appears that non-constituents are conjoined, such as gapping and non-constituent coordination (NCC). In light of this, I argue in section 4 that LNB can be explained by general constraints on movement, ellipsis, or selection. Section 5 is a conclusion.

2 Left-Node Blocking and the Principle of Full Clusivity

As stated in the introduction, O&G note that although coordination is so permissive in allowing various combinatorial options (2a-h), there are cases of left-sharing in coordination that are strictly banned by the grammar (2i-l) (the sentences are ungrammatical under the indicated bracketing). O&G refer to this phenomenon as *left node blocking* (LNB).

(2) (Osborne and Gross, 2017, 646, selected from (7))

- a. Her [brother] and [sister] gave you these today.
- b. Her brother [found] and [gave] you these today.
- c. Her brother gave you these [today] and [yesterday].
- d. Her brother [gave you] and [loaned me] these today.
- e. Her brother gave [you these] and [me those] today.
- f. Her brother gave you [these today] and [those yesterday].
- g. ? [Her brother gave] and [his sister loaned] you these today.
- h. Her brother gave [you these today] and [me those yesterday].
- i. * Her [brother gave] and [sister loaned] you these today.
- j. * Her [brother gave you] and [sister loaned me] these today.
- k. * Her [brother gave you these] and [sister loaned me those] today.
- l. * Her [brother gave you these today] and [sister loaned me those yesterday].

Although the previous literature has not used the term LNB, examples of this phenomenon have been reported by several researchers (e.g., Baker, 1978; Neijt, 1980; Hudson, 1988; Wilder, 1997; Phillips, 2003; Osborne, 2008; Sailor and Thoms, 2013; Sportiche *et al.*, 2014):

- (3) a. * Photographs [of movie stars cost a dollar] and [of baseball players cost a penny].
(Baker, 1978, 275)
- b. * The University's [students are intelligent] and [faculty is committed to freedom].
(Neijt, 1980, 52)
- c. * In [Paris we danced] and [Rome we sang]. (Hudson, 1988, 338, (76))

- d. * Three [blue cars arrived] and [red cars departed]. (Wilder, 1997, 76)
- e. * The man [who built the rocket has] and [who studied robots designed] a dog. (=1a)
- f. * the King [of England's crown] and [of Spain's scepter] (Osborne, 2008, 1139, (65))
- g. * I taught the guy that knows [Icelandic how to dance] and [Faroese how to sing].
(Sailor and Thoms, 2013, 363, (15b))
- h. * This girl in the red [coat will] and [dress must] put a picture of Bill on your desk.
(Sportiche *et al.*, 2014, 65)

To explain LNB, O&G devise the principle of full clusivity (PFC), which dictates that “a constituent preceding the/a root in the initial conjunct of a coordinate structure must be included in or excluded from that coordinate structure entirely.” (Osborne and Gross, 2017, 654) Thus, sharing of *the* in (4) is blocked because the initial conjunct cuts into the constituent *the man*:

- (4) * The [man arrived] and [woman left]. (Osborne and Gross, 2017, 674, (15a))

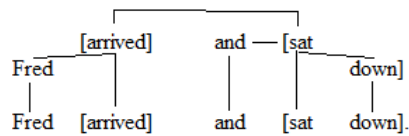
O&G base their analysis on two assumptions. First, coordination may conjoin non-constituent strings, which O&G refer to as STRING COORDINATION. Thus not all cases of apparent coordination of non-constituents should be derived from larger categories. For instance, O&G assume that the coordination in sentences like (5) does not have to be derived from larger constituents (i.e., *Tom saw you first and (Tom) saw me second*).

- (5) Tom saw [you first] and [me second]. (Osborne and Gross, 2017, 664, (33a))

As is clear in the LNB cases presented above, this assumption is crucial for the application of the PFC; the PFC would be irrelevant if these examples were derived from larger categories because there would not be left-sharing in the first place.

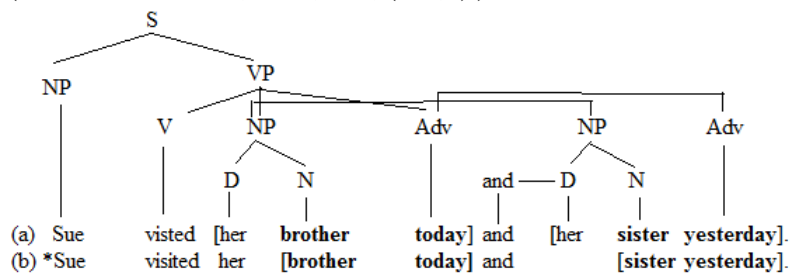
Second, structures are constructed from left to right in terms of constituencies and dependencies in a Dependency Grammar framework. These structures lack a TP/IP projection, and root nodes are replaced by lexical items:

(6) (Osborne and Gross, 2017, 649, (8b))



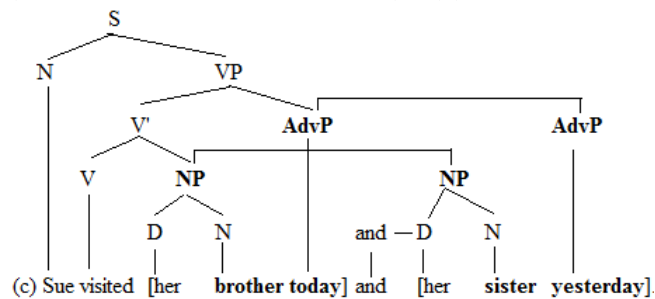
As can be seen (6), the conjuncts are linked by a dependency line, and only the initial conjunct is linked to the preceding element.¹ Note that assuming that structures are constructed from left to right is crucial because, as O&G claim, this reflects how the PFC works: a string cannot be shared in coordination if it has not been admitted as a constituent online, assuming that left to right derivations reflect how linguistic strings are processed. O&G further contend that the PFC makes the right predictions if it operates on flat structures. For example, while the PFC makes the right predictions about the acceptability of left sharing in (7) with flat structures, it gives a wrong result in (8) with more layered structures, predicting that the sentence should be ungrammatical.

(7) (Osborne and Gross, 2017, 675; (64a,b))



¹O&G argue that having the element following/preceding the coordinate structure reach into the closest conjunct captures the linear effects in selection of and agreement with a coordinate phrase (for Generative analyses of linear effects in coordination see for instance Marušič *et al.* 2015 and Murphy and Puškar 2018 for agreement).

(8) (Osborne and Gross, 2017, 675; (64c))



Consequently, O&G claim that although coordination fails to be a reliable constituency test, the restrictions on left sharing in coordination provides insights on the nature of syntactic structures: syntactic structures should be flat.

3 Against string coordination

As mentioned in the previous section, O&G claim that for their analysis to go through, it is crucial to assume that coordination may operate on non-constituent strings, making this assumption specifically for cases of gapping and NCC, being the ones that are relevant to LNB. To clarify, what is conjoined in examples like (9) is non-constituent strings, meaning that what you see is what you get. Note that, by this claim, O&G reject analyses that posit an abstract level of representation in which coordination combines full-fledged constituents.

(9) (adapted from Osborne and Gross, 2017, 665, (36a); 652, (14))

- a. Fred saw [Larry today] and [Bill yesterday] (gapping)
- b. I saw [you yesterday in the store] and [Susan on Friday in traffic]. (NCC)

Note, however, that O&G acknowledge that certain cases of gapping, specifically those that seem to violate the PFC (10a), cannot be subsumed under string coordination, and are rather analyzed as derived from larger constituents (10b). As a result, O&G point out that they should not constitute a violation to the PFC because they involve no left-sharing.

- (10) a. Sam edits articles [on ducks at home] and [on geese at work]. (Osborne and Gross, 2017, 665, (38))
- b. Sam edits articles on ducks at home and (Sam) edits articles on geese at work.

In this section, I argue against a string coordination analysis of gapping and NCC, citing evidence that these constructions are derived from full constituents. I will also show that the differences between conjunct-external sharing and conjunct-internal sharing presented by O&G support this conclusion. As I will argue in section 4, that coordination can only conjoin constituents has a bearing on the question why certain cases of left-sharing are ruled out by the grammar.

3.1 Gapping

Gapping, a term first coined by Ross (1967), occurs when verbal material goes missing from a non-initial conjunct:

- (11) Some had ordered mussels, and others swordfish. (Toosarvandani, 2016, 381, (1); adapted)

As a background, gapping received (at least) two types of analysis, which I will refer to as reductionist and non-reductionist analyses. The reductionist analyses derive gapping from larger categories via ellipsis/movement, and they come in two forms. In the first form, gapping is derived from a clause-sized constituent (e.g., Jackendoff, 1971; Ross, 1967; Sag, 1976; Pesetsky, 1982; Williams, 1977; Jayaseelan, 1990), whereas in the second form it is derived from a ν P-sized constituent (e.g., Coppock, 2001; Yatabe, 2001; Lin, 2002; Crysmann, 2003; López and Winkler, 2003; Beavers and Sag, 2004; Chaves, 2007; Johnson, 2009; Toosarvandani, 2016). As for the non-reductionist analyses, they derive gapping from mechanisms that do without ellipsis/movement, and they also come in two forms. One example is what Kubota and Levine (2015) call the direct coordination analysis in which non-constituents are somewhat viewed as constituents (also Steedman 1985; Dowty 1988). Another is the analysis under investigation, namely O&G's string coordination analysis.

A major type of argument against the reductionist analyses of gapping comes from scope ambiguity (e.g., Siegel, 1984, 1987; Oehrle, 1987; McCawley, 1993; Johnson, 2004; Kubota and Levine,

2016; Potter *et al.*, 2017), as exemplified in (12), where the modal and negation can have a wide-scope reading in which they outscope the coordinate structure or a distributive-scope reading in which they scope locally within each conjunct.

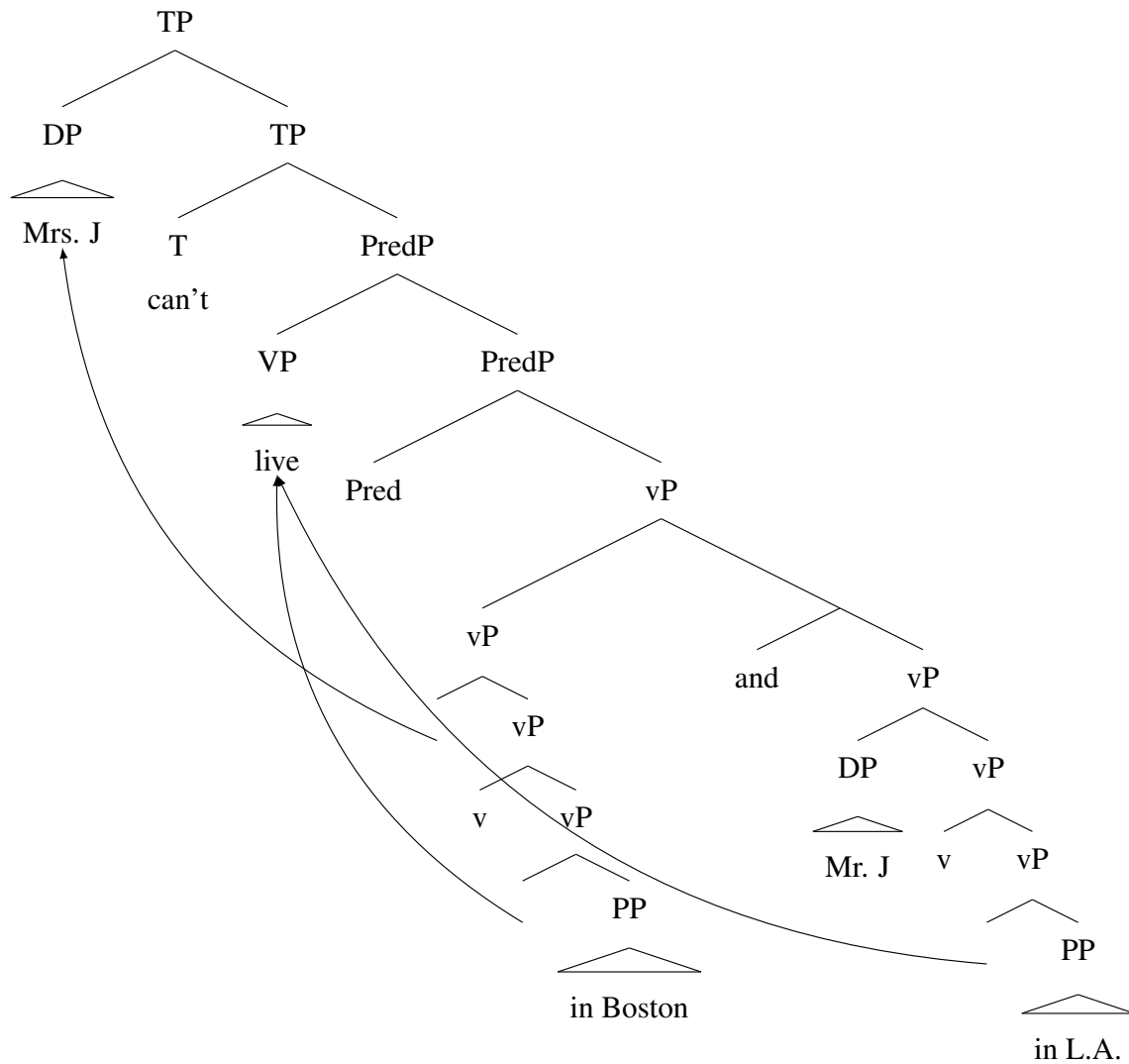
(12) Mrs. J can't live in Boston and Mr. J \emptyset in LA. (Kubota and Levine, 2016, 109,(5a))

As noted by Kubota and Levine (2016), Potter *et al.* (2017), and the others, analyses that assume that gapping is derived from clause-sized constituents do not capture the wide-scope reading in examples like (12); they only capture the distributive-scope reading (I ~~strickethrough~~ elided material with no bias to a any analysis).

(13) Mrs. J can't live in Boston and Mr. J ~~ean't live~~ in L.A.

On the other hand, the analyses that assume that gapping is derived from ν P-sized constituents do not account for the distributive-scope reading, and can only account for the wide-scope reading. For instance, Johnson (2000, 2009) proposes that gapping is derived from a ν P-sized source where verbs are ATB-moved to a higher position and where scope-taking elements are higher than the coordinate structure, as illustrated in (14) for (13) (I differ from Johnson in using binary branching structures. See for instance Al Khalaf 2015 for a recent review of the literature on coordinate structure). As can be seen, this analysis can only capture the wide-scope reading.

(14)



In a recent study, however, Potter *et al.* (2017) propose a solution to this problem by arguing that gapping is derived from two sources: a clause-sized source and a vP-sized source. Hence, the ambiguity in gapping is reduced to a case of structural ambiguity. Potter et al. argue that evidence for this two-source analysis is the fact that gapping interacts with independent factors, to the effect that only one of the readings is available in certain syntactic contexts. To clarify, consider the examples below:

(15) (Potter *et al.*, 2017, (39))

- a. To Mary, James didn't give a cupcake or Bill chocolates.
- b. With only ten dollars between them, James could get a sandwich, and Mary a bowl of soup.
- c. Often, James orders mussels, and Mary shrimp.
- d. Never does Kim play bingo or Sandy chess.

As pointed out by Potter *et al.*, a constituent appears in a left peripheral Topic Phrase in examples like (15a,b) (Rizzi, 1990), and in a peripheral Focus Phrase in examples like (15ac,d) (Rizzi, 1990; Haegeman, 2000). Hence, necessarily, the gapping here should be derived from a CP-sized source because it is impossible for the topicalized/focused phrase to scope over the coordinate structure unless the coordination is clausal. Given this, the fact that only a distributive-scope reading is available in these examples suggests that the ambiguity is structural. Therefore, scope ambiguity in gapping does not argue against reduction; on the contrary, it provides support for analyses that derive gapping from a conjunction of constituents. Thus, O&G's claim that certain cases of gapping should receive a string coordination analysis – which is implicitly based on a general rejection of the analyses in which gapping is derived from larger constituents – is untenable.

3.2 NCC

NCC has received much interest since the 1970s and continues to be a topic of heated debate in more recent work (e.g., Hudson, 1976; Sag, 1976; Hudson, 1982; Sag *et al.*, 1985; Dowty, 1988; Wilder, 1997; Beavers and Sag, 2004; Osborne, 2008; Hofmeister, 2010; Sailor and Thoms, 2013; Bruening, 2015; Kubota and Levine, 2015). Like gapping, NCC received two types of analysis: a reductionist analysis that derives the coordination from larger categories (e.g., Wilder, 1997; Crysmann, 2003; Beavers and Sag, 2004; Hofmeister, 2010; Sailor and Thoms, 2013; Bruening, 2015) and a non-reductionist analysis that derives the coordination via mechanisms that do without ellipsis/movement (e.g., Dowty, 1988; Steedman, 1989; Kubota and Levine, 2015).

A major argument leveled against the reductionist analyses is also derived from scope ambiguity – which O&G capitalize on to support their string coordination analysis. Sailor and Thoms

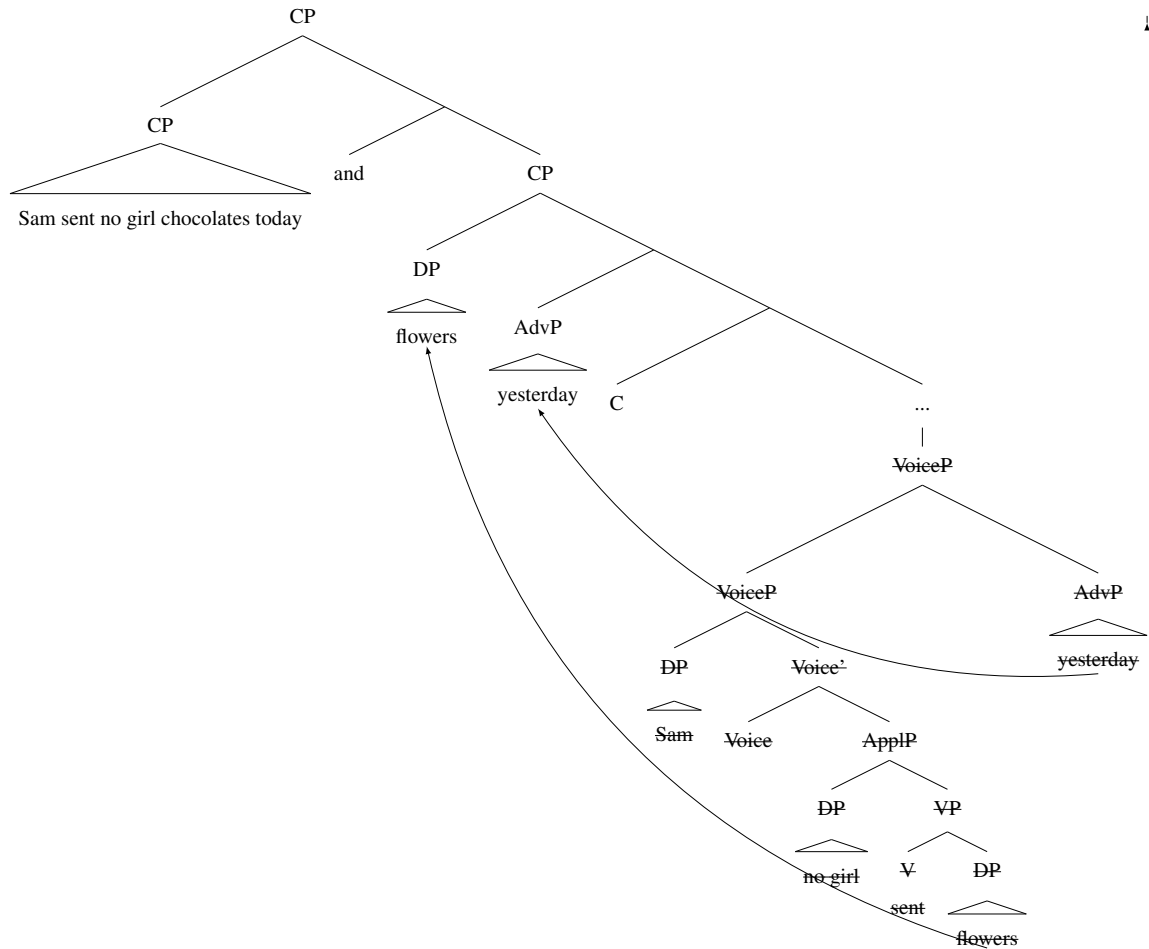
(2013), Kubota and Levine (2015), Osborne and Gross (2017), and others note that NCC exhibits the same type of scope ambiguity observed in gapping. In (16a), the negative operator introduced by *no girl* can have a wide scope reading in which the sentence means: it is not the case that Sam sent a girl chocolates today and flowers yesterday, a reading that is unavailable in the non-elliptical counterpart in (16b), where the negative operator scopes locally in each conjunct. This fact is problematic to analyses that take NCC to be derived from larger categories.

(16) (adapted from Osborne and Gross, 2017, 669, (50))

- a. Sam sent no girl chocolates today and flowers yesterday.
- b. Sam sent no girl chocolates today and sent no girl flowers yesterday.

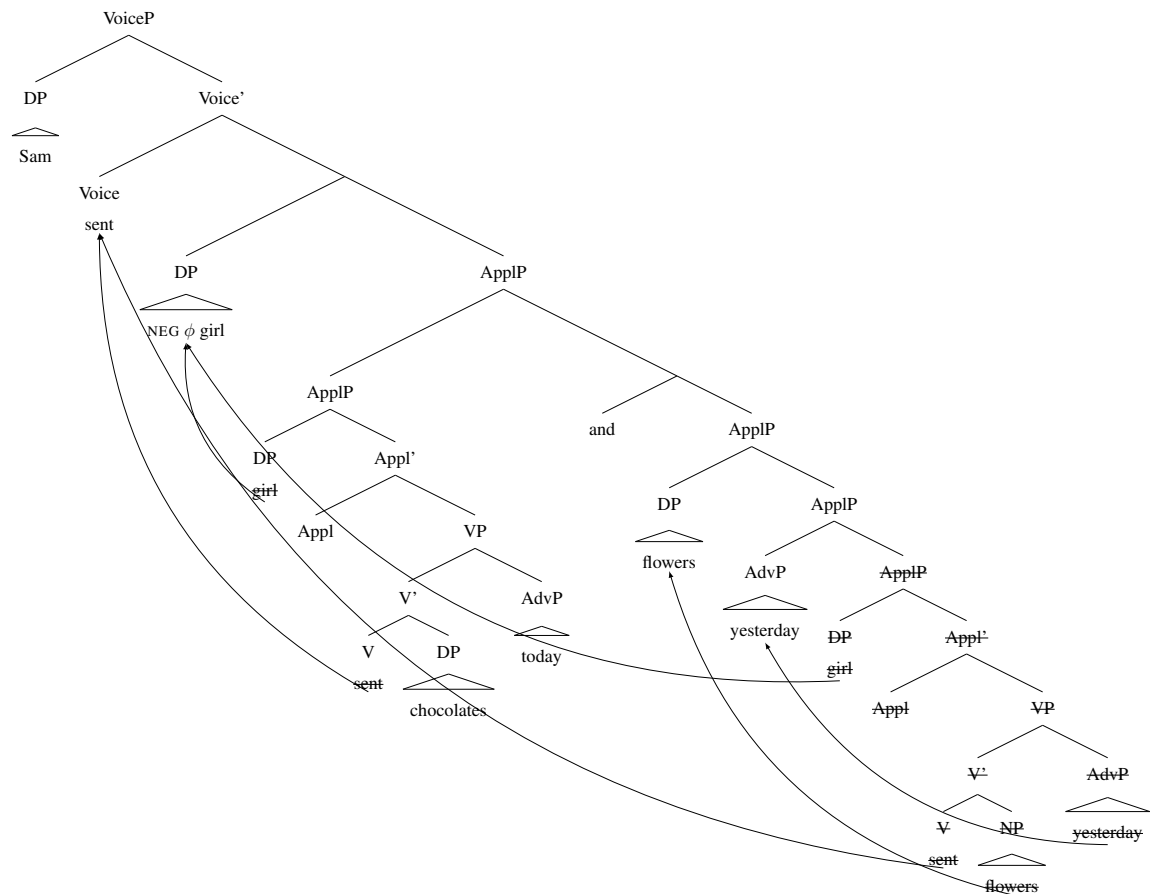
Sailor and Thoms (2013), however, propose an analysis that solves this paradox – an analysis that is similar to Potter et al.’s analysis of gapping in spirit. In this analysis, NCC is derived from two sources: a CP source and a vP source. To illustrate, the distributive reading in examples like (16a) arises when NCC is derived from conjoined CPs as in (16b). The phrases that survive the ellipsis (which Sailor and Thoms refer to as *chunks*) move leftward to the edge of the non-initial conjunct. I illustrate the derivation of the distributive reading in (17) for (16a) (I use a binary-branching coordinate structure. Following Bruening (2001, 2010), I assume that in double object constructions, the theme argument is an argument of the verb, while the goal/recipient is introduced by an Appl(licative) head that comes between the verb and Voice. I further assume, following Bruening, that V moves to Voice via Appl. These assumptions are not crucial, however).

(17)



The wide scope reading in (16a), on the other hand, arises from low coordination of *v*Ps, where the sentential negation is higher than the coordinate structure. Following assumptions by Johnson (2009) and Penka (2011), the negative determiner is decomposed into a higher sentential negation and a lower indefinite at LF. The chunks *flowers* and *yesterday* undergo leftward movement to the edge of their conjunct, and I assume that *sent* and *girl* ATB move (leftward) outside the coordinate structure (note that *girl* combines with the negation to form *no girl*).

(18)



As shown above, scope ambiguity in NCC is a case of structural ambiguity and, consequently, makes a strong argument against a string coordination analysis such as the one proposed by O&G.

Further evidence for analyzing NCC as involving constituents comes from movement effects in NCC as presented by Sailor and Thoms (2013) (but see Bruening 2015 who revisits these arguments and argues that NCC results from ellipsis of a prosodic constituent rather than movement). First, NCC shows island sensitivity. For instance, although possessive DPs can be NCC chunks, a part of a possessive DP cannot:

(19) (Sailor and Thoms, 2013, 363, (13))

- a. John wrote everyone's favourite song about football in 2001 and everyone's favourite song about basketball in 2012.

- b. *?John wrote everyone's favourite song about football in 2001 and basketball in 2012.

Similarly, a relative clause can be a chunk in NCC, but a subpart of it cannot:

(20) (Sailor and Thoms, 2013, 363, (15))

- a. I taught the guy that knows Icelandic how to dance and the guy that knows Faroese how to sing.
- b. * I taught the guy that knows Icelandic how to dance and Faroese how to sing.

Second, immovable constituents cannot be NCC chunks. For example, as argued by Abels (2003), a TP that is a complement to an overt C cannot move:

(21) * He knows Icelandic, I'm sure that. (Sailor and Thoms, 2013, 364, (20a))

The fact that a TP cannot be a chunk in NCC – although a CP can perfectly be – suggests that the derivation of NCC involves movement out of a full-fledged constituent:

(22) (Sailor and Thoms, 2013, 364, (21))

- a. The witness will testify to whether John knew Icelandic tomorrow and whether he knew Faroese next week.
- b. * The witness will testify to whether John knew Icelandic tomorrow and he knew Faroese next week.

In the same way, in verb-particle constructions, the particle cannot move, nor can the particle plus the object (23):

(23) (Sailor and Thoms, 2013, 365; (22), (23))

- a. I blew up the inflatable chair.
- b. *Up, I blew the inflatable chair.
- c. *Up the inflatable chair, I blew.

Neither the particle nor the particle plus the object can serve as chunks in NCC (24):

(24) a. John blew out the candle and blew up the inflatable chair.

- b. *John blew out the candle and up the inflatable chair.

Additional facts suggest that NCC is derived via reduction – although they do not particularly point to a movement analysis. One fact comes from plural agreement (Beavers and Sag, 2004; Bruening, 2015) and licensing of items sensitive to plurality, like plural floating quantifiers (Bruening, 2015), as illustrated in (25). The fact that verbs show plural agreement with subjects involving NCC and that NCC may associate with floating quantifiers that are sensitive to plurality prove that NCC conjoins constituents.

(25) (Bruening, 2015, 2, (6a,b))

- a. Bill catching a fish on Monday with a fly rod and on Tuesday with a spear were both surprising.
- b. Micah claiming he was an astronaut to impress Bill and a spy to impress Bob were different events.

Another fact comes from examples in which NCC occurs in a medial conjunct, where a following conjunct involves no reduction. As shown by Beavers and Sag (2004), examples like (26) suggest that NCC is derived from larger constituents; otherwise it would be hard to explain the structure of the final conjunct:

(26) Jan [[travels to Rome tomorrow], [[to Paris on Friday], and [will fly to Tokyo on Sunday]]].
(adapted from Beavers and Sag, 2004, 54, (10))

In conclusion, O&G's string coordination analysis of NCC is untenable. NCC is a coordination of full constituents that have undergone reduction.

3.3 On conjunct-external sharing and string coordination

O&G argue that not all cases of gapping involve coordination of non-constituent strings. To distinguish the cases of gapping that should be subsumed under string coordination from those that should not, they claim that the former show properties of conjunct-external sharing, while the latter show properties of conjunct-internal sharing, highlighting a number of differences between the

two. In what follows, I go through these differences and show that they in fact provide evidence that with conjunct-external sharing (i.e., string coordination), it is constituents that are conjoined.

First, O&G show that subject-verb agreement is strict with conjunct-external sharing, but not with conjunct internal sharing:

(27) (Osborne and Gross, 2017, 662; (22), (24))

a. ?? Have [you started] and [she stopped]?

b. Have [you started] and [they stopped]?

(28) [You have started to read], and [she/her ~~has started~~ to write].

However, this observation actually suggests that a string coordination analysis of conjunct-external sharing is inaccurate. More specifically, the strict agreement requirement with conjunct-external sharing receives a plausible explanation if the sharing results from ATB movement of the shared constituent/element, which is only possible if the coordination involves full-fledged constituents. In this case, sharing would only be possible if the lower copies of the ATB moved element match in form because ATB movement is restricted by semantic (e.g., Munn, 1993; Fox, 2000; ?) and syntactic/morphological (e.g., Franks, 1995; Citko, 2005) parallelism:

(29) Have [you ~~have~~ started] and [they ~~have~~ stopped]?



On the other hand, conjunct-internal sharing as in (28) allows agreement mismatches because the gapping here is not derived via ATB movement (e.g., Potter *et al.*, 2017). I assume that only the cases of gapping that are derived from a *vP* source can involve ATB movement (e.g., 14), which is not what we see here. The gapping here is rather derived via ellipsis, and ellipsis is less strict with agreement mismatches.

In addition, O&G show that, unlike conjunct-internal sharing, conjunct-external sharing is strict concerning pronoun forms:

(30) (Osborne and Gross, 2017, 663, 26)

a. Has [he started] and [she finished]?

b. ?? Has [he started] and [her finished]?

- (31) [He started this evening], and [her ~~started~~ yesterday morning]. (Osborne and Gross, 2017, 663, 28)

Again, this difference can be explained if what derives conjunct-external sharing is ATB movement. It is the parallelism constraint on ATB movement that forces the pronouns to match in form across the conjuncts. This constraint is not operative in conjunct-internal sharing which is not derived via ATB movement. Thus, once again, this indicates that so-called string coordination is just a normal coordination of constituents.

Another difference is that redundancy is possible with conjunct-external sharing (32a), but not with conjunct-internal sharing (32b). That is, in conjunct-external sharing, repetition of material in the non-initial conjunct is possible, but is impossible with conjunct-internal sharing.

- (32) (Osborne and Gross, 2017, 663, (30))

- a. There is [watermelon at home] and [watermelon at work].
b. ?? [At home there is watermelon], and [at work ~~there is~~ watermelon].

However, that gapping disallows redundancy in the gapped conjunct follows from the fact that gapping involves contrastively focused remnants (e.g., Oehrle, 1987; Gengel, 2013). For remnants to be contrastive, they must be distinct from the elements they contrast with; thus, it is not surprising that gapping does not allow redundancy.

The possibility of redundancy with conjunct-external sharing, on the other hand, would be accounted for if sharing resulted from ATB movement, which does not give rise to contrastively focused constituents in the non-initial conjunct (it is the shared element that moves; no other movements apply). If this reasoning is correct, then the facts from redundancy suggest that conjunct-external sharing involves coordination of constituents.

Furthermore, O&G note that conjunct-external sharing and conjunct-internal sharing give rise to different interpretations. For instance, a Yes-No question with conjunct-external sharing is understood as a normal Yes-No question – which can be answered with *yes* or *no*, whereas a Yes-No question with conjunct-internal sharing gives the meaning of a forced-choice question:

(33) (Osborne and Gross, 2017, 664, (32))

- a. A: Did you drink [coffee today] or [tea yesterday]?
B: Yes.
- b. A: [Did you drink coffee today], or [~~did you drink~~ tea yesterday]?
B: Tea yesterday.

Again, this observation is not remarkable given that gapping is derived via focus movement of the constituents that survive the gapping operation (whether that operation is movement or ellipsis/deletion): a Yes-No question with contrastive focus gives a forced-choice reading. In contrast, a Yes-No question with conjunct-external sharing – which I argue is derived via ATB movement – has no contrastively focused constituents; thus it is understood as a normal Yes-No question, not a forced-choice question.

The conclusion reached, then, is that the differences between conjunct-external sharing and conjunct-internal sharing are predicted if conjunct-external sharing involves coordination of full-fledged constituents, and if sharing is a result of ATB movement.

3.4 Interim Conclusion

In this section, I presented evidence that gapping and NCC – two cases of coordination relevant to LNB – involve coordination of full-fledged constituents. I also showed that the distinctions between conjunct-external sharing and conjunct internal sharing can be understood if what is conjoined in conjunct-external sharing is constituents. This conclusion will be crucial in explaining why certain cases of left-sharing are blocked by the grammar.

4 LNB is an effect of illicit movement or illicit ellipsis

Having shown that coordination can only target constituents, I now turn to the restrictions on left-sharing in coordination. It is intuitive to say that left-sharing in coordination occurs via one of three mechanisms (or a combination thereof). The first and most straightforward mechanism is leftward movement (i.e., ATB movement) of the shared constituent out of the coordinate structure, as seen in ATB wh-movement (34a), ATB topicalization (34b), ATB VP fronting (34c), etc. Also, cases of

subject sharing can be seen as involving ATB movement (34d, ignoring RNR); the subject moves across-the-board from a coordinate vP (cf. Johnson, 2009).

- (34) a. **Where** did [Mary vacation and Bill decide to live]? (Munn, 1999, 421, (1a))
 b. **The same man** [Mary helped and Jane ruined]. (Zhang, 2010, 223, (9.2a))
 c. **Criticize himself**, [John will but Mary won't]. (Al Khalaf, 2015, 174, (383))
 d. **Bo** [has now started drafting and will soon finish] his play. (adapted from Osborne and Gross, 2017, 661, (21))

Note that in this case, sharing is allowed only if the shared element/string is movable and the constraints on moving that element/string are all respected.

The second mechanism is ellipsis in a/the non-initial conjunct, which is what we see in NCC:

- (35) a. **John persuaded** [Bill to write a book and Max to write a play]. (Dowty, 1988, 169, (20e))
 b. **I told stories about** [my family for a few minutes and my pets for a few hours]. (Sailor and Thoms, 2013, adapted from 362,(6))
 c. **They put the knives yesterday** [in intricately worked leather sheathes to protect them and carved wooden boxes to protect us]. (Bruening, 2015, 5, (25b))

Note, however, that if the movement analysis proposed by Sailor and Thoms (2013) is correct, it is not clear that NCC involves syntactic sharing because the shared string does not syntactically fall outside the coordinate structure. Rather, the non-initial conjunct involves movement, while constituents within the initial conjunct remain within the conjunct. I suggest instead that sharing in NCC is a result of prosody (cf. Bruening, 2015). For example, in (35b), it is the prosodic prominence of *my family for a few minutes* and *my pets for a few hours* that make the string *told stories about/I told stories about* prosodically independent and, consequently, sound to be left-shared between the conjuncts. However, that sharing via this mechanism is licit only if the strings that appear in a/the non-initial conjunct are movable shows that the sharing is still restricted by syntactic constraints.

The third mechanism is selection, where a head selects for a coordinate dependent (36). Intuitively, sharing via selection is licit only if the shared element and the coordinate structure can enter in a selection relation.

- (36) a. His novels **combine** [wit and irony] which merge in a unique and recognizable voice.²
 b. You can **mix** [paint and varnish] to achieve a variety of painting techniques.³

Given these mechanisms, I argue that LNB arises if left-sharing violates constraints on movement, ellipsis, or selection – or a combination thereof.

To explain how my proposal derives the LNB phenomenon, the LNB data discussed in O&G and cited from the previous literature are limited to three forms. In the first form, the left-shared element is a subpart of a subject, where two clauses are conjoined (ignoring RNR in some cases):

- (37) a. * Old [men like sunshine] and [women like sunshine]. (Kohrt, 1976, 103, fn. 30)
 b. * Photographs [of movie stars cost a dollar] and [of baseball players cost a penny].
 (=3a)
 c. * The University's [students are intelligent] and [faculty is committed to freedom].
 (=3b)
 d. * Books [about flowers are wonderful] and [about poetry are dull]. (Neijt, 1980, 52, (113'b))
 e. * Too [many boys came] and [few girls wanted to dance]. (Hudson, 1988, 331)
 f. * Three [blue cars arrived] and [red cars departed]. (=3d)
 g. * The merchant of [Venice was broke] and [Verona was rich]. (Fromkin *et al.*, 2000, 161)
 h. * The man [who built the rocket has] and [who studied robots designed] a dog. (=1a)
 i. * The [chairman has resigned from the board] and [company has replaced him]. (Radford, 2004, 71)

²<http://www.literaturnights.eu/en/2013/city/22-london/author/78/?lang=en>

³https://www.ehow.com/how_8622001_paint-paint-varnish-mix.html

- j. * This girl in the red [coat will] and [dress must] put a picture of Bill on your desk.
(=3h)
- k. * The [man arrived] and [woman left].(Osborne and Gross, 2017, 674, (15a))
- l. * A man [with long hair arrived] and [with short hair left]. (Osborne and Gross, 2017, 654, (15b))

The ungrammaticality of left-sharing in all of these examples is due to the fact that the shared elements cannot have moved from within the coordinate phrase because they are immovable. For instance, neither of them can be the pivot in a cleft structure (note also that, in all of these examples, movement of the shared elements would violate the Left Branch Condition of Ross 1967):

- (38) a. * It is old that ~~old~~ men like sunshine
- b. * It is photographs that ~~photographs~~ of movie stars cost a dollar.
- c. * It is the university's that ~~the university's~~ students are intelligent.
- d. * It is books that ~~books~~ about flowers are wonderful.
- e. * It was too that ~~too~~ many boys came.
- f. * It was three that ~~three~~ blue cars arrived.
- g. * It was the merchant of that ~~the merchant of~~ Venice was broke.

Additionally, the left-sharing here cannot have been derived via ellipsis, assuming the movement analysis of Sailor and Thoms (2013), because some of the strings appearing in the non-initial conjunct – which would be chunks of NCC if the coordination were grammatical – are immovable:

- (39) a. * It is of baseball players that photographs of ~~baseball players~~ cost a penny.
- b. * It is faculty that the university's ~~faculty~~ is committed to freedom.
- c. * It is about poetry that books ~~about poetry~~ are dull.
- d. * It was who studied robots that the man ~~who studied robots~~ designed a dog.

Needless to say, sharing via selection is impossible here because, in all of the examples, the shared elements do not select for the category of the coordination, not to mention the fact that they do not head the projections they occur in (e.g., *old* is not the head of *old men*).

In the second form, the left-shared element is a subpart of a fronted constituent (a PP or CP):

- (40) a. * In [Paris we danced] and [Rome we sang]. (=3c)
b. * Before [school I study] and [work I sleep]. (=1b)
c. * After Wallace fed [his dog the postman] and [his sheep the milkman] arrived. (Phillips, 2003, 49, (22c))

If we take example (40a), in which the shared element is a subpart of a fronted PP, left-sharing is ruled out because the shared element cannot have moved outside the coordination because movement out of a fronted constituent is independently barred by the grammar (41). In fact, prepositions never move out of a PP, stranding their complements (42).

- (41) * It is before that ~~before~~ school, I study. (cf. *It is before school that I study.*)

- (42) * Before, I study ~~before~~ school. (cf. *I study before school*)

Example (41) is a failed attempt at sharing between fronted CPs within conjoined clauses. Again, sharing is blocked because it could not have been derived via any of the sharing mechanisms outlined above. For instance, sharing could not have been derived via ellipsis in the non-initial conjunct via movement of chunks to the edge of their conjunct because not all of the strings appearing in the non-initial conjunct are movable. More specifically, ignoring RNR of *arrived*, and given that the coordination can only conjoin full-fledged constituents, and therefore the coordination must be derived from a conjunction of larger categories (43), it is impossible for *his sheep* to move outside the fronted CP in the non-initial conjunct to the edge of the conjunct because again this violates the constraint against moving out of a moved constituent (44).

- (43) After Wallace fed his dog, the postman arrived, and after Wallace fed his sheep, the milkman arrived.

- (44) * It was his sheep that after Wallace fed ~~his-sheep~~, the postman arrived.

In the third form of LNB, what is left shared is a string, particularly a V plus a subpart of its complement, in what appears to be coordination of *v*Ps (assuming that the coordination is low, but a clausal coordination is possible as well):

- (45) a. * Wallace **gave his** [dog half a dozen] and [sheep a handful of] crackers for breakfast.
(Phillips, 2003, 49, (22b))
- b. * Susan **repairs old** [bicycles in the winter] and [cars in the summer]. (=1c)
- c. * I **taught the guy that knows** [Icelandic how to dance] and [Faroese how to sing].
(=3g)
- d. * The witness will **testify to whether** [John knew Icelandic tomorrow] and [he knew Faroese next week]. (=22b)
- e. * Larry **helps his** [friend before class] and [parents after school]. (Osborne and Gross, 2017, 654, (15d))
- f. * Jim **liked that talk** [about gapping because it was insightful] and [about clefting because it contained interesting data]. (Osborne and Gross, 2017, 654, (15e))

Left-sharing is ruled out here because the shared string is immovable; it cannot be VP-fronted (46), nor can it be the pivot of a cleft structure (47). Thus, it cannot have ATB moved from within the coordinate structure.

- (46) * Suzan said she will repair old bicycles in the winter, and repair old she did ~~repair old~~ bicycles in the winter.

- (47) * It was repair old that Suzan did ~~repair old~~ bicycles in the winter.

Also, it is impossible for the sharing to have been derived via ellipsis in the non-initial conjunct because some of the strings that appear in the non-initial conjunct are immovable (48), thus they cannot have been moved to the edge of the non-initial conjunct.

- (48) a. * It is cars that Susan repairs old ~~ears~~ in the summer.
- b. * He knew Faroese next week, the witness will testify to whether he ~~knew Faroese next week~~
- c. * It was about clefting that Jim liked that talk ~~about clefting~~ because it contained interesting data.

Thus, as shown above LNB can be explained as a violation of constraints on movement, ellipsis, or selection, which are not specific to coordination.

Note also that the analysis developed here captures cases of preposition sharing which violate the PFC:

- (49) He drives to [Denver on Tuesday] and [Tucson on Wednesday]. (Osborne and Gross, 2017, 670, (54))

Here the initial conjunct cuts into a constituent, in violation of the PFC; thus, the PFC predicts that this sentence should be ungrammatical, contrary to fact. O&G argue that this violation is limited in scope; it is only possible in P-stranding languages like English. A non-P stranding language like Danish, for instance, does not pose an issue to the PFC because it does not permit sharing of prepositions:

- (50) Bill tager til butkiken først og *(til) banken derefter.
 Bill goes to store.the first and to bank.the thereafter
 (adapted from Osborne, 2008, 1143) (Danish)

However, this explanation is unsatisfactory and does not explain the relationship between left-sharing and preposition stranding. The analysis proposed here gives a more plausible explanation. First, the coordination here involves full-fledged constituents:

- (51) He [_{VP} drives to Denver on Tuesday] and [_{VP} drives to Tuscon on Monday].

Left-sharing occurs via ellipsis in the non-initial conjunct, where the chunks undergo leftward movement to the edge of the conjunct. Thus, a language like English would allow the complement of a preposition to move leftward, stranding the preposition (52). A non-P-stranding language like Danish does not allow such a movement.

- (52) He [_{VP} drives to Denver on Tuesday] and [_{VP} [Tuscon] [on Wednesday] [_{VP} drives to Tuscon
 on Wednesday]]
-

To recapitulate, in this section I have derived LNB from general constraints on movement, ellipsis or selection. I have shown that for each form of the LNB phenomenon, left-sharing cannot have been allowed by the grammar because sharing would either violate an established constraint on movement or ellipsis, or would not be a result of any other sharing mechanism available in the grammar (i.e., selection). I have also shown that the proposal explains a case that is problematic to the PFC of O&G. Thus, I conclude that the PFC is redundant because it can be derived from deeper principles of the grammar. This has the direct consequence that any claims based on the PFC become untenable, such as the claim that syntactic structures should be construed as flat.

5 Conclusion

In this paper, I investigated the LNB phenomenon, a constraint on left-sharing in coordination that has recently been introduced by Osborne and Gross (2017). I first argued against O&G's claim that coordination may operate on non-constituent strings, focusing on gapping and NCC, being the two main sources of the LNB data. I presented facts that suggest that in these forms of coordination, what is being conjoined is constituents. In light of this, I proposed that LNB can be captured without resort to a construction-specific principle such as the PFC, which is based on problematic assumptions: that coordination does not have to target constituents and that structures should be parsed as flat. More specifically, I argued that certain cases of left-sharing are barred by the grammar simply because they violate constraints on movement, ellipsis or selection, which are not specific to coordination. Thus, aside from the fact that the PFC is based on problematic assumptions, the PFC is also redundant and can be derived from deeper constraints of the grammar. A direct consequence of the analysis is that LNB provides further support for the long-standing assumption that coordination can only operate on constituents.

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