

On the limits of across-the-board movement: Distributed extraction coordinations

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1. Introduction

It is well-known that extraction out of conjuncts is disallowed, unless the moving element moves out of each conjunct. This well-known phenomenon is illustrated by (2)-(3). The ban on extraction out of conjuncts, given in (1), is standardly referred to as the Coordinate Structure Constraint (CSC), and the rescuing effect in (3) as across-the-board-movement (ATB).

- (1) Extraction out of conjuncts is disallowed.
- (2) *Who_i did you see [enemies of t_i] and John?
- (3) Who_i did you see [friends of t_i] and [enemies of t_i]?

Both the CSC and the ATB exception were noted in Ross (1967). (4) and (5) give the original formulations of the CSC and the ATB exception.¹

- (4) In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct (Ross 1967:98-99)
- (5) There is an important class of rules to which (4) does not apply. These are rule schemata which move a constituent out of all the conjuncts of a coordinate structure (Ross 1967:107)

The upshot of (4)-(5) is that extraction of X out of a conjunct is unacceptable unless X is extracted out of each conjunct of the coordination.

There is an interesting exception to this well-known pattern that has not received much attention, the most detailed discussions being smaller parts of larger works, in particular Postal (1998) and Zhang (2010). The exception concerns examples like (6).²

- (6) Which book_i and which magazine_j did [John buy t_i] and [Bill read t_j] respectively?

Postal (1998) provides strong evidence that *which book* and *which magazine* undergo separate extractions out of the conjuncts in (6), and Zhang (2010) argues that such cases involve coordination-formation that takes place after (more precisely, through) movement.³ These examples violate the CSC ban in (1). They also do not fit the ATB pattern in (3): it is not the case that the moving element is extracted out of each conjunct in (6). (6) in fact appears to involve two separate extractions, of two different elements, out of the conjuncts. One may then expect (6) to be even worse than (2).

¹(4) also involves a ban on extraction of conjuncts, which will not be examined in this work (the ban on extraction out of conjuncts and the ban on extraction of conjuncts have anyway been argued to be independent conditions, see e.g. Grosu 1973, Postal 1998, Stjepanović 2014a, Oda 2017).

²There are some differences across speakers regarding the most natural prosody of such constructions. The judgments given below reflect the most natural prosody for the speakers in question (not all speakers accept such coordinations in the first place).

³Zhang argues the higher ConjP is formed through sideward movement, proposed in Nunes (2004). The analysis (and an alternative involving regular movement into a ConjP) is discussed in section 6.

The goal of this paper is to examine this kind of constructions, which for ease of exposition I will refer to as distributed extractions. Additional cases of distributed extractions will be discussed in the effort to examine restrictions on distributed extractions. Evidence will be provided that all these cases involve coordination formation after movement (I will refer to such coordination as late coordination) and the precise timing of (and the operations involved in) this late coordination formation will be discussed. It will also be argued that distributed extractions are actually subject to the ATB requirement, which will shed light on the nature of the ATB phenomenon itself. It will also be shown that there is a rather strong restriction on distributed extractions which confines such extractions to one context and completely excludes one type of movement from participating in such extractions.

It should, however, be noted that one of the main goals of the paper is descriptive, namely to broaden the scope of the phenomenon empirically. There has been very little discussion of the phenomenon in question outside of English (and outside of constructions like (6)). In this respect, the paper will bring in additional languages, with constructions which are quite different from (6). The restrictions on distributed extraction coordination established below should also be looked at from this perspective: their goal is to empirically broaden the scope of the phenomenon in question—in this respect the restrictions are actually more important than their deductions (in several cases I will in fact leave deductions open). At any rate, one of the main goals of this paper is to prompt further crosslinguistic investigation of the phenomenon in question as well as several related properties of coordination which are discussed below.

The paper is organized as follows. In section 2 I present arguments (mostly from Postal 1998, but also new arguments) that (6) involves extraction out of each conjunct. The section will also show that the ATB requirement (more precisely, a reformulated ATB requirement) is operative with such constructions. In sections 3 and 4 I present additional cases of distributed extractions and show that these additional cases are also subject to the reformulated ATB requirement. The possibility of mixing distributed extraction and traditional ATB in the same sentence is also discussed. Section 5 establishes a new generalization regarding the availability of distributed extractions. Section 6 examines the exact timing (and the mechanism) of late-coordination formation. Section 7 is the conclusion, and Appendix discusses a related construction that also involves late coordination, outlining the range of possible crosslinguistic variation in the relevant domain.

2. Distributed coordinations with wh-movement in English

2.1. Distributed coordinations involve separate extractions

Postal (1998) gives strong evidence that each wh-phrase is separately extracted from the conjuncts in constructions like (6). A rather strong argument to this effect is provided by the possibility of binding into the individual conjuncts in (7), where *which man* binds an anaphor in the first conjunct and *which woman* binds an anaphor in the second conjunct.

(7) [Which man]_i and [which woman]_j did respectively the doctor talk to t_i about himself_i, and the lawyer talk to t_j about herself_j (Postal 1998:161)

Such licensing is also possible with parasitic gaps, as shown by (8), where the first wh-phrase licenses a parasitic gap in the first conjunct and the second wh-phrase licenses it in the second conjunct.

(8) [Which secretary]₁ and [which programmer]₂ did Jerome respectively fire t₁ after finding t₁ drunk and hire t₂ after finding t₂ sober? (Postal 1998:136)

Another argument comes from cases where the extracted elements contain an anaphor: the anaphor can be bound within the first conjunct or within the second conjunct, as in (9) (for a somewhat different reconstruction effect, see (74)).⁴

- (9) a. (?) [Which painting] and [which book about herself_i] did John buy and Mary_i sell respectively?
b. (?) [Which book about herself_i] and [which painting] did Mary_i buy and John sell respectively?

Also relevant are examples like (10). It is well-known that the indirect object in double object constructions cannot undergo *wh*-movement. This constraint is also operative with distributed coordinations, as shown by (10b).

- (10) a. [Which nurse]₁ and [which hostess]₂ did Ernest sell cocaine to t₁, and George sell heroin to t₂, respectively?
b. *[Which nurse]₁ and [which hostess]₂ did Ernest sell t₁ cocaine and George sell t₂ heroin, respectively? (Postal 1998:135)

2.2. The ATB requirement on distributed coordinations

The evidence discussed in the previous section shows that distributed coordination constructions like (6) involve separate *wh*-movements from each conjunct. As such, they do not fit the traditional ATB-exception-to-the-CSC schema, where the CSC is voided if the moving element moves out of each conjunct. Notice, however, that examples like (6) do actually involve movement out of each conjunct, the difference between (3) and (6) being that in (3) it is the same element that moves out of each conjunct while in (6) different elements move out of the conjuncts.

Interestingly, it turns out that the ATB requirement holds for constructions like (6) as well. This is shown by the unacceptability of (11)-(12), which contrast with (13).

- (11) *Which book_i and which magazine_j did [John buy t_i], [Bill read t_j] and [Mary write a novel] respectively?
(12) *Which book_i and which magazine_j did [Mary write a novel], [John buy t₁] and [Bill read t₂] respectively?
(13) Which book_i, which magazine_j and which novel_k did [John buy t_i], [Bill read t_j] and [Mary borrow t_k] respectively?

These data indicate that the ATB requirement is at work in the construction under consideration: movement still must take place out of each conjunct. This means that the ATB requirement needs to be reformulated: it is not the case that the moving element must move out of each conjunct; rather, movement must take place out of each conjunct. It can be the same element moving out of each conjunct or different elements: as long as there is a gap in each conjunct the ATB requirement is satisfied. I will refer to the cases where different elements move from the conjuncts as non-ATB ATB.⁵

⁴Some speakers do not find a difference between (9a) and (9b), while some have a slight preference for either (9a) or (9b) (hence (?) in the examples).

⁵Regarding examples like (i), where *wh*-movement takes place out of the second and third, and head-movement out of the first conjunct, they will be discussed in section 5, where we will see that a problem independent of the ATB requirement arises here.

(i) *[Which book_i and which magazine_j] did_k [Mary t_k write a book], [John may buy t_i], and [Bill will read t_j] respectively.

Not only does the ATB requirement hold for distributed coordination constructions but it in fact holds in the same way as with regular ATB constructions. It is well-known that there is an interpretative parallelism requirement on regular ATB. Thus, both gaps must be either subjects or objects (the requirement is actually more detailed than that, it can also affect two internal arguments and concerns thematic prominence—see Franks 1993, 1995 and references therein).

- (14) *I wonder who_i [t_i left] and [Mary kissed t_i]
(15) *I wonder who_i [John saw t_i] and [t_i kissed Mary]

Zhang (2010:193) observes the data in (16)-(18), which indicate that the parallelism requirement in question also holds for non-ATB ATB.

- (16) [[Which nurse]_i and [which hostess]_j] t_i dated Fred and t_j married Bob respectively?
(17) [[Which nurse]_i and [which hostess]_j] did Fred date t_i and Bob marry t_j, respectively?
(18) *[[Which nurse]_i and [which hostess]_j] did Fred date t_i and t_j marry Bob, respectively?

Zhang does not discuss cases involving cross-clausal extraction. With regular ATB, the parallelism requirement in question is relaxed; i.e. it does not hold with cross-clausal ATB, as (19) shows.

- (19) I wonder who_i [John saw t_i] and [Peter thinks t_i kissed Mary]

The same holds for distributed extraction coordinations.⁶

- (20) Which writer_i and which actor_j does John adore t_i and Peter claim t_j will succeed in Hollywood respectively.

The ATB requirement thus holds in the same way in distributed coordination constructions as with regular ATB constructions, which further indicates that the former are a type of ATB constructions although they don't involve extraction of the same element (hence the term non-ATB ATB).

In the following sections I will present additional cases of non-ATB ATB which are quite different from English examples like (6). We will see that the ATB requirement holds in these cases as well: although different elements are moving out of the conjuncts there must be movement out of each conjunct. The cases discussed in the following sections will also enable us to establish additional restrictions on non-ATB ATB.

3. AP ATB in SC

I now turn to a case of distributed ATB in Serbo-Croatian (SC) which has interesting additional properties. SC productively allows left-branch extraction of adjectives (see Corver 1992, Bošković 2005, 2013a, Despić 2011, Talić 2017, 2019, among many others).⁷

⁶ One of my informants actually rejects (20). Importantly, the informant also disallows (19) (the informants who accept (20) also accept (19)), which confirms that non-ATB ATB and regular ATB indeed behave in the same way with respect to the parallelism requirement in question.

⁷These authors argue that constructions like (21) involve extraction of the AP out of the NP. There are two alternative analyses: remnant movement of the NP which contains only the AP (Franks and Progovac 1994; Abels 2003) and full NP movement with scattered deletion, where the NP is deleted in the highest copy and the AP in the lower copy (Fanselow and Ćavar 2002). There are a number of arguments in the literature for the left-branch

- (21) Crvena_i se je meni [t_i suknja] dopala.
 red self is me_{DAT} skirts pleased
 ‘The red skirt pleased me.’

It also allows it in distributed coordinations. One difference from English wh-movement involving distributed coordination is that such cases involving adjectival ATB in SC do not require “respectively” (in fact, there is no clear counterpart of *respectively* in SC; note that in some cases *respectively* is not needed in English, see (81)).⁸

- (22) Crvene i bijele ona suknje i kapute prodaje.
 red and white she skirts and coats is-selling
 ‘She is selling red skirts and white coats.’
- (23) Crvena i bijela meni suknja i haljina smetaju.
 red and white me_{DAT} skirt and dress bother
 ‘The red skirt and the white dress bother me.’

It is also possible to have three adjectives in this type of constructions, as in (24), with the relevant traces indicated in (25).

- (24) Crvena, bijeli i šareni meni suknja, kaput i šešir smetaju.
 red white and colorful me_{DAT} skirt coat and hat bother
- (25) Crvena_i, bijeli_j i šareni_k meni [t_i suknja], [t_j kaput] i [t_k šešir] smetaju.
 red white and colorful me_{DAT} skirt coat and hat bother

Importantly, as in the case of English non-ATB ATB examples from section 2, the ATB requirement is operative in the SC construction under consideration. Thus, (26), where ATB does not take place out of the last conjunct, is unacceptable.

- (26) *Crvena_i i bijeli_j meni [t_i suknja], [t_j kaput] i [šareni šešir] smetaju.
 red and white me_{DAT} skirt coat and colorful hat bother

One might try to argue that the ATB requirement in English cases like (11)-(12) is somehow forced by *respectively*. This, however, would not extend to SC (25), where *respectively* is not present.

It should be pointed out that ATB-violating examples like (26) improve if the first two conjuncts are pronounced as a single prosodic unit (followed by a pause), with another coordinator, as in (27). What is going on here is that *suknja i kaput* form a coordination, which is then coordinated with *šareni šešir*. In other words, we are not dealing here with a single coordination with three conjuncts, as in (25)-(26), but with two separate coordinations, each of which has two conjuncts: *suknja i kaput* forms a ConjP that is itself located in the Spec of a ConjP (the head of the second coordination takes *šareni šešir* as its complement), as shown in (28).

extraction analysis, which is adopted here; see e.g. Bošković (2005), Stjepanović (2010, 2012); Talić (2013, 2017), and Despić (2015). The reader is also referred to Bošković (2019) for discussion of the CSC regarding SC, where it is shown that (1) is operative in SC.

⁸All the judgments below are given **only** for the distributive reading, indicated in the translations of (22)-(23) (and with the traces when they are given in the structures below).

- (27) ?Crvena_i i bijelij_j mene (t_i suknja i t_j kaput) i [šareni šešir] iritiraju.
 red and white me skirt and coat and colorful hat irritate
 ‘The red skirt, white coat and colorful hat irritate me.’
- (28) ?Crvena_i i bijelij_j mene [_{ConjP1} ([_{ConjP2} t_i suknja i t_j kaput])] i [šareni šešir] iritiraju.
 red and white me skirt and coat and colorful hat irritate

This kind of examples also have consequences for the domain of application of the ATB requirement. While there is extraction out of each conjunct of ConjP2, this is not the case with ConjP1 in (28). What matters here is that the first conjunct of ConjP1, which is the only conjunct from which extraction takes place, is itself a ConjP. The ATB requirement apparently does not hold across ConjPs (in a configuration where a ConjP dominates a ConjP).⁹

This in fact holds for regular ATB as well, as indicated by (29) (assuming the same prosody as in (28), with the first two conjuncts pronounced as a single prosodic unit (with a pause following them); *crvene* here undergoes regular ATB extraction from the first ConjP—as result, “red” modifies both “skirts” and “dresses”).

- (29) ?Crvene_i mene [_{ConjP1} ([_{ConjP2} t_i suknje i t_i haljine])] i [šareni šeširi] iritiraju.
 red me skirts and dresses and colorful hats irritate
 ‘Red skirts, red dresses and colorful hats irritate me.’

It should also be noted that there is evidence that we are dealing with actual extraction in the relevant cases. This is confirmed by their island-sensitivity. Thus, the presence of an adjunct island between the extracted APs and the remnant NPs causes ungrammaticality in (30).¹⁰

- (30) *Crvena_i, bijelij_j i šareni_k je otišao zato što mene [t_i suknja], [t_j kaput] i [t_k šešir] iritiraju.
 red white and colorful is left because me skirt coat and hat irritate
 ‘He left because the red skirt, white coat, and colorful hat irritate me.’

⁹ What may matter here is the following: Chomsky (2013) proposes that the first conjunct determines the category of the whole coordination (which essentially means that the coordination itself does not inherently have it; note that Chomsky’s proposal is stated somewhat differently, in terms of labeling), and a number of authors (e.g. Sag et al 1985, Takahashi 1994, Bošković 2019) have argued that the ATB requirement is related to the coordination-of-likes requirement (see Chomsky 1957, Schachter 1977, Williams 1978, Sag et al 1985, Bowers 1993, Beavers and Sag 2004, among others, on this requirement). An intuitive idea here is that when the first conjunct, which is supposed to determine the category of a coordination, is itself a coordination, the category of the higher coordination is undetermined—this then voids the ATB requirement, which is tied to category specification (this is what is relevant to the coordination-of-likes requirement). This makes a prediction, which is borne out: if the order of the conjuncts in (28) is switched, the category of the coordination will be determined since the first conjunct is not a coordination; this then activates the ATB requirement, ruling out (i) because it does not have a gap in each conjunct (namely the first conjunct).

(i) *Crvena_i i bijelij_j mene [_{ConjP1} [šareni šešir] i ([_{ConjP2} t_i suknja i t_j kaput])] iritiraju.
 red and white me colorful hat skirt and coat irritate

¹⁰ See also de Vos and Vicente (2005) regarding islandhood of English non-ATB ATB. One of their examples, involving an inner island effect, is given in (i) (see this work for additional examples, but see also Zhang 2010:175).

(i) *[[How loudly]_i and [how softly]_j] didn’t you say [[that John had spoken t_i] and [that Peter had replied t_j]]?

There is another rather interesting aspect of the SC construction under consideration. Consider (31). There are only two fronted APs in (31), with three nouns in the lower coordination. Yet, in contrast to (26), (31) is acceptable.

(31) Crvena_i i bijeli_j meni suknja, kaput i šešir smetaju.
 red and white me_{DAT} skirt coat and hat bother

What is important here is that (31) is acceptable only on a particular meaning: ‘red skirt, white coat, and white hat’, where a traditional ATB dependency is formed between ‘white coat’ and ‘white hat’ with respect to ‘white’. What makes this possible is that both ‘coat’ and ‘hat’ are masculine: the adjective that modifies them is also masculine (note that *crvena* and *suknja* are feminine).

(32) Crvena_i i bijeli_j meni [t_i suknja], [t_j kaput] i [t_j šešir] smetaju.
 red and white me_{DAT} skirt coat and hat bother

The ATB requirement is then still satisfied in (31): (31) is in fact acceptable only on the reading on which there is an AP-gap in the base position of each of the conjuncts in (31). What is particularly interesting about this example is that it involves a mix of non-ATB ATB and regular ATB. Examples like (31) then provide evidence that non-ATB ATB can be mixed with true ATB.

Another example of this sort is given in (33), which involves regular ATB between ‘red skirt’ and ‘red shirt’ (*košulja* is feminine).

(33) Crvena_i i bijeli_j meni [t_i suknja], [t_i košulja] i [t_j kaput] smetaju.
 red and white me_{DAT} skirt, shirt and coat bother

A question arises whether this kind of mixing of non-ATB ATB and regular ATB is also possible in English. It turns out that it is although constructions of this type are less acceptable in English than in SC possibly because of an additional processing load. (Gender agreement resolves the relevant filler gap dependencies in SC; this filler gap dependency resolution is not available in English. It is also possible that the presence of *respectively* interferes here, leading to an expectation that there should be three antecedents for the three gaps.¹¹)

(34) ?How many cakes and how many letters did Mary bake, John write, and Peter mail respectively?

(35) ?How many cakes and how many letters respectively did Mary bake, John write, and Peter mail?

(36) ?Which magazine and which book did Peter buy, John read, and Mary borrow respectively?

(37) ?Which magazine and which book respectively did Peter buy, John read, and Mary borrow?

Returning to SC, interestingly, in contrast to (32), (38) is unacceptable.

(38) *Bijeli_i i crvena_j meni [t_i kaput], [t_j suknja] i [t_i šešir] smetaju.
 white and red me_{DAT} coat skirt and hat bother

Apparently, a traditional ATB dependency can only be formed between contiguous NPs here. There can be no ATB between ‘red skirt’ and ‘red hat’ given that the adjective needs to agree with the nouns and

¹¹Speakers differ regarding the preferred position for *respectively* here, hence both options are given in the examples.

these nouns have different gender (*suknja* is feminine and *šešir* masculine). Also, there can be no ATB between ‘white coat’ and ‘white skirt’ since these nouns also have different gender (*kaput* is masculine and *suknja* feminine). Interestingly, there can apparently be no ATB between ‘white coat’ and ‘white hat’. There is no gender disagreement issue here since the nouns have the same gender.

The same effect is found in English. Thus, (39), where given the pragmatics of the example regular ATB dependency has to hold between the first and the third conjunct, skipping the second conjunct, is worse than (35)-(37), where this is not the case. This contrast also provides evidence that the English and the SC construction in question should be treated in the same way (given that both exhibit the contiguity effect).

(39) *How many letters_i and how many cakes_j did Peter write t_i, John bake t_j, and Mary address t_i respectively?

We may be dealing here with a locality effect on traditional ATB formation, where it is not possible to skip a potential ATB site.¹²

Alternatively, this may be related to a general interpretive effect associated with distributed extraction coordinations. Notice first that examples like (6) are not ambiguous: the first trace must correspond to the first wh-phrase and the second trace to the second wh-phrase. In other words, only a crossing wh-trace dependency is possible here; a nesting dependency, which would give an interpretation where the first trace corresponds to the second wh-phrase, is disallowed. This is a general property of distributed extraction coordinations. Thus, (40) gives the only possibility for the interpretation of the extracted adjectives in this SC example, where all adjectives have the same gender, and (41) illustrates the same effect for English distributed coordination constructions involving three conjuncts, where the indices again indicate the only possibility for the interpretation of the conjuncts (the parallel behavior of the SC and the English construction under consideration in this respect can be taken as another argument for treating the two in a uniform manner).

(40) Crveni_i, bijeli_j i šareni_k meni [t_i sako], [t_j kaput] i [t_k šešir] smetaju.
 red white and colorful me_{DAT} jacket coat and hat bother
 ‘The red jacket, white coat, and colorful hat bother me.’

(41) Which book_i, which magazine_j, and which painting_k respectively did [John buy t_i], [Bill read t_j], and [Mary sell t_k]?

Distributed extraction coordinations apparently require crossing dependencies. Returning now to the unacceptable example in (38), which mixes non-ATB ATB and regular ATB, gender specification of the adjectives forces the dependencies shown in (42).

¹²This could also be seen as a maximize ATB effect, similar to Merchant’s (2001) Max Elide (see Citko 2003 for a Max ATB-style proposal). It may be worth noting that a similar effect is found with parasitic gaps, which are often treated similarly to ATB (see e.g. Nunes 2004, who treats both in terms of sideward movement), as the following data from Nissenbaum (2000:547) show: it is not possible to skip a potential parasitic gap site in (i).

- (i) a. Who did you praise *e* to the sky [after criticizing *e*] [in order to surprise *e*]?
 b. Who did you praise *e* to the sky [after criticizing *e*] [in order to surprise **him**]?
 c. *Who did you praise *e* to the sky [after criticizing **him**] [in order to surprise *e*]?
 The contrast between (32) and (38) in fact parallels the contrast between (ib) and (ic).

Another case of the maximize ATB effect may be provided by the contrast between (32) and (ii).

(ii) *Crvena_i, crvena_j i bijeli_k meni [t_i suknja], [t_j košulja] i [t_k kaput] smetaju.
 red red and white me_{DAT} skirt, shirt and coat bother

(42) *Bijeli_i i crvena_j meni [t_i kaput], [t_j suknja] i [t_i šešir] smetaju.
 white and red me_{DAT} coat skirt and hat bother

(42) involves a mixture of crossing and nesting dependencies (the last trace is involved in a nesting dependency). It then seems plausible that it is ruled out due to the general crossing dependencies requirement on distributed coordinations.

As for the source of the effect of question, notice that what we are dealing with here is essentially a matching effect: the order of the conjuncts within the newly formed ConjP must match the order of the conjuncts from which extraction takes place in the original ConjP. Given that in this kind of cases, the co-ordination structure is in a sense “re-created” in a higher position, with another ConjP, it seems natural to assume that there should be some parallelism between the two coordinations where the order of the conjuncts in the higher ConjP should correspond to the order of the conjuncts (which contain the relevant gaps) in the lower ConjP, which means that the first conjunct should correspond to the first gap, the second conjunct to the second gap and so on. The result of this is strictly crossing dependencies. Under this approach the ordering effect is essentially a parallelism effect.

Before concluding this section, one potentially interfering issue should be discussed. Consider (43). Gračanin-Yukseš (2007) and Citko and Gračanin-Yukseš (2013) show that SC examples like (43) can involve either coordinated wh-phrases or coordinated clauses, with ellipsis taking place in the first conjunct (they implement ellipsis through multidominance structures).

(43) Ko i šta kupuje?
 who and what is-buying
 ‘Who is buying what?’

Evidence for the possibility of a clausal structure for (43) is provided by the possibility of examples like (44), where a clitic (*je*) follows the first as well as the second wh-phrase: this indicates that the first conjunct is actually a clause, and the same holds for the second conjunct.

(44) Ko je i šta je kupio?
 who is and what is bought
 ‘Who bought what?’

A question then arises whether SC examples like (23) could be analyzed as involving coordinated clauses with ellipsis in the first conjunct instead of involving coordination formation in the moved position. Crucially, (45) differs from (44) regarding clitic placement.

(45) *Crvene su i bijele su meni suknje i haljine smetale.
 red are and white are me_{DAT} skirts and dresses bothered
 ‘The red skirts and the white dresses bothered me.’

The contrast between (44) and (45) then provides evidence that in (23)/(45) we are not dealing with a larger coordination: it really is APs that are coordinated here. In other words, we have here evidence that

the construction in question does not involve a larger, clausal coordination with ellipsis in the first conjunct.¹³

It is also worth noting here that SC clitics are second position clitics (see Bošković 2001 and references therein); as such they are standardly used as a constituenthood test (since they cannot follow more than one constituent). Clitic placement in (46) then confirms that *crvene i bijele* is a single constituent, which is indeed the case under the coordination-in-the-moved position analysis.¹⁴

- (46) Crvene i bijele su meni suknje i haljine smetale.
 red and white are m_{EDAT} skirts and dresses bothered
 ‘The red skirts and the white dresses bothered me.’

Additional evidence that we are dealing here with a regular coordination in the moved position is provided by comparing left-branch extraction non-ATB ATB cases, which involve multiple left-branch extraction with coordination, with multiple left-branch extraction cases that do not involve coordination. Bošković (2016) discusses multiple left-branch extraction cases like (47).¹⁵

- (47) Onu_i staru_j prodaje t_i t_j kuću.
 that old sells house
 ‘He is selling that old house.’
 (48) *Prodaje onu i staru kuću.
 sells that and old house
 ‘He is selling that old house.’
 (49) *[Onu i staru]_i prodaje [t_i kuću].
 that and old sells house

(47) shows that multiple left-branch extraction of the demonstrative and the adjective is possible (left-branch extraction of both demonstratives and adjectives is in principle possible in SC). The elements in question cannot be coordinated within a single NP in situ, as shown by (48); not surprisingly, they also cannot undergo left-branch extraction as a coordination, as shown by (49).

Turning now to non-ATB ATB left-branch extraction, such cases also involve multiple LBE. Notice, however, that (23) contrasts with (50).

- (50) *Oni_i i bijele_j meni [t_i kaputi] i [t_j haljine] smetaju.
 those and white m_{EDAT} coats and dresses bother
 ‘Those coats and white dresses bother me.’

¹³It is also not clear how the interpretation would work on the clausal ellipsis analysis, given that ‘white’ modifies only the second conjunct (i.e. “dress”) in (23).

¹⁴There is a potential prosodic issue in (46). For some speakers, under the most natural prosody the fronted adjectives bear focal stress and are followed by a pause. This causes an issue regarding clitic placement. There is variation across speakers whether under certain conditions a clitic can follow a sentence internal pause (see Bennett 1987, Percus 1993, Browne 1975, Schütze 1994, Bošković 2001). I ignore here speakers for whom there needs to be a pause following the fronted adjectives and who disallow clitic placement after such a pause (pronominal clitics are quite generally disallowed in that case, hence they are avoided below in this context).

¹⁵On the relevant reading, *onu* is not a separate nominal in (48)-(49) (demonstratives can be separate nominals, as in *I like this*) but modifies *kuću*, just like *staru* (there is only one nominal on this reading, ‘that old house’). Below, where possible different gender will be used for the demonstrative and the adjective to control for this issue.

What we see at work in (50) is what is at work in (47)-(48). The relevant elements, the demonstrative and the adjective, can undergo left-branch extraction; in fact they can be involved in multiple left-branch extraction, as shown by (47). However, these elements cannot be coordinated, as shown by (48), hence they cannot undergo left-branch extraction as a coordination (cf.(49)). The ungrammaticality of (50) is not surprising from this perspective: (50) is ruled out on a par with (48) because *one* and *bijele* cannot be coordinated. That the restriction in question is relevant in (50) is not surprising given that elements that undergo non-ATB ATB are involved in a coordination with each other. However, in contrast to (48), where the demonstrative and the adjective are coordinated in their base position and modify the same noun, the demonstrative and the adjective obviously cannot be involved in a coordination in their base position in (50). This is so because of the interpretation of (50), which is “those coats and white dresses”–the demonstrative and the adjective do not modify the same noun in (50), in contrast to (48). The coordination in (50) can then only take place after movement, since the relevant elements are clearly not coordinated in their base-position. The individual movements themselves also must be possible in (50), given that such multiple left-branch extraction is in principle possible, as shown by (47) (see Bošković 2016). (50) is thus ruled out because it involves illicit coordination, where the coordination takes place after movement. The data in question then also provide evidence that we are indeed dealing here with late coordination formation (i.e. non-base coordination).

Notice that we also have additional evidence here that non-ATB ATB examples involving left-branch extraction do not involve a larger coordination with ellipsis in the first conjunct. Under such an analysis we would not be able to appeal to the impossibility of coordination of a demonstrative and an adjective, i.e. the ungrammaticality of (48), since this is not what would be coordinated in (50) under that analysis.¹⁶

Another issue that is relevant here is that a clitic (*mu*) can intervene between the demonstrative and the AP in (47), as shown by (51). Recall that this is not possible with non-ATB ATB constructions, as shown by (45).

(51) ?Onu_i mu staru_i prodaje t_i t_j kuću.
 that him_{DAT} old sells house
 ‘He is selling that old house to him.’

All this confirms the coordination in the moved position analysis of (23)/(45). Elements undergoing multiple LBE need not move to the same position, hence a clitic can intervene between them, as in (51). Elements involved in non-ATB ATB (as in (45)), on the other hand, are located in the same position, in fact non-ATB ATB involves a coordinated phrase, hence a clitic cannot intervene between the relevant elements, which are coordinated with each other.

The above data thus provide additional evidence that coordination formation should not be restricted to base-generation (i.e. lexical insertion/external merge), i.e. it should not be restricted in such a way that it can only occur pre-movement.

In summary, in this section we have seen another case of non-ATB ATB, which also involves non-base coordination formation and which is also subject to the ATB requirement. We have also seen that the ATB requirement does not apply across ConjPs. Furthermore, we have seen that non-ATB ATB can be combined with traditional ATB and that the crossing dependencies requirement on distributed

¹⁶It is worth noting here that NP ellipsis that strands demonstratives and adjectives is also possible in SC, see Bošković (2013b). One might try to treat (23) this way. The ungrammaticality of (50), however, provides evidence not only against the clausal ellipsis analysis, but also against the NP ellipsis analysis.

coordination is maintained regardless of whether such constructions involve only non-ATB ATB or a mixture of non-ATB ATB and traditional ATB.

4. Japanese numeral constructions

Japanese floating quantifier constructions provide another case of non-ATB ATB extraction.¹⁷ Consider (52).

- (52) John-ga [VP [PP yaoya-kara] [mikan-o 3-ko]-to [banana-o 5-hon] katta.
 John-NOM vegetable.store-from orange-ACC 3-CL and banana-ACC 5-CL bought
 ‘John bought [3 oranges and 5 bananas] from a vegetable store.’

Importantly, it is possible to extract the NP from the conjuncts in (52), with a coordination structure recreated in a higher position (‘respectively’ is optional here; see also footnote 17).

- (53) John-ga [mikan-to banana]-o yaoya-kara (sorezore) [3-ko]-to [5-hon] katta.
 John-NOM orange and banana-ACC vegetable.store-from respectively 3-CL and 5-CL bought

Furthermore, the ATB requirement is also imposed in such cases, as shown by the contrast between (56), where extraction takes place from each conjunct, and (55), where this is not the case (extraction does not take place from the last conjunct).¹⁸

- (54) John-ga yaoya-kara [mikan-o 3-ko]-to [banana-o 5-hon]-to [budou-o 2-fusa] katta.
 John-NOM vegetablestore-from orange-ACC 3-CL and banana-ACC 5-CL and grape-ACC 2-CL bought
 ‘John bought 3 oranges, 5 bananas and 2 bunches of grapes from a vegetable store.’
 (55) ?*John-ga [mikan-to banana]-o yaoya-kara (sorezore) [3-ko] to [5-hon] to
 John-NOM orange and banana-ACC vegetable.store-from respectively 3-CL and 5-CL and
 [budou-o 2-fusa] katta.
 grape-ACC 2-CL bought

¹⁷As with other languages, there is some controversy regarding whether Japanese floating quantifiers should be analyzed in terms of Sportiche (1988)-style stranding, or as adverbials generated outside of the relevant nominals (for relevant discussion of Japanese, see Miyagawa 1989, Kawashima 1998, Ishii 1999, Miyagawa and Arikawa 2007, Watanabe 2006, 2008, Fitzpatrick 2006, Nakanishi 2008, among others). The controversy is actually not relevant to the current discussion; the point made in this section holds regardless of which of these two analyses is adopted. In this respect, it should be noted that Kamio (1977) argues for Sportiche’s analysis on the basis of examples like (52). Koizumi (1995), however, points out that (52) can be analyzed in accordance with the adverbial analysis if what is coordinated in (52) is VPs, with the verb undergoing string vacuous V-to-T-to-C movement, with each numeral adjoined to a VP conjunct (this is necessary under the semantic implementations of the adverbial analysis, as in Nakanishi (2004) and Brisson (1998), where the individual numerals, not a ConjP containing the numerals, need to be composed with the VP). Given this, regardless of which of these two analyses of floating quantifiers is adopted, examples like (53) below involve non-ATB ATB out of a coordination, which is what is important for our purposes. (The two analyses would differ regarding what is coordinated in (52)-(53), nominals or VPs, but that difference is not relevant for our purposes—under both analyses examples like (53) would involve non-ATB ATB out of a coordination, the relevant nominals would move either from a coordinated quantifier+nominal complex or from inside of coordinated VPs).

¹⁸For independent reasons, it is not possible to test the possibility of mixing non-ATB ATB and regular ATB here (regular ATB is independently not possible in this case since the ATBed NP would have to be associated with two different numbers).

(56) John-ga [mikan-to banana-to budou]-o yaoya-kara (sorezore) [3-ko] to [5-hon] to
 John-NOM orange and banana and grape-ACC vegetable.store-from respectively 3-CL and 5-CL and
 [2-fusa] katta.
 2-CL bought

As another parallel to SC, (55) is actually marginally acceptable if there is a pause following the second conjunct in the lower ConjP (i.e. if the first two conjuncts in the lower ConjP form a separate intonational phase). This is the same prosody as the one discussed above with respect to SC (27). Recall that this prosodic pattern, on which the first two conjuncts in (54) are pronounced as a single prosodic unit, has a different derivation, on which ‘three oranges’ and ‘five bananas’ form a coordination (as reflected in this unit also forming a prosodic unit), which is then coordinated with “two grapes”. In other words, on this prosodic pattern we are dealing here with two separate coordinations, each of which has two conjuncts.

Notice also that examples like (55) show island sensitivity, as shown by (57), where an adjunct island intervenes between the final and the original position of the relevant elements.¹⁹

(57) ?*mikan-to banana-o Mary-wa [John-ga yaoya-kara (sorezore) 3-ko-to 2-hon
 orange and banana-ACC Mary-TOP John-NOM vegetable.store-from respectively 3-CL and 2-CL
 katta-kara] okotta
 bought-because got.angry
 ‘Mary got angry because John bought 3 oranges and 2 bananas from a vegetable store.’

The Japanese construction under consideration in this section thus represents another case of non-ATB ATB, where movement takes place out of each conjunct, but it is different elements that are moving out of the conjuncts. As in the case of non-ATB ATB examples from English and SC discussed above, the ATB requirement holds in this case too: although different elements are extracted, extraction must take place from each conjunct.

5. When is non-ATB ATB possible?

The above data confirm the existence of non-ATB ATB, where there is movement out of each conjunct but different elements are moving out of the conjuncts. In other words, the ATB requirement should be stated in a such a way that it does not require that the same element moves out of each conjunct but simply that there is movement out of each conjunct.

There is another interesting property of non-ATB ATB. All the cases involving non-ATB ATB discussed above involve coordination formation in the moved position. What happens when non-ATB ATB is attempted without coordination formation in the moved position? Consider in this respect (58):

(58) *Which president do you wonder which famous writer John reads [articles about t] and [essays by t] respectively?

(58) involves extraction of different elements from a single coordination without coordination formation in the higher position. In English this requires moving wh-phrases to different +whCPs, which in turn brings in a wh-island violation. Still, (58) is clearly much more degraded than typical wh-island

¹⁹Note also that, as in SC, nothing can be inserted between the elements undergoing non-ATB ATB in the Japanese construction under consideration.

violations.²⁰ The fact that the contrast between (58) and (6) is stronger than a typical wh-island violation suggests that coordination formation in the moved position is necessary for non-ATB ATB.

Consider also (59)-(60), which also involve non-ATB ATB without coordination formation in the moved position. Both examples are unacceptable. Furthermore, (60), where movement does not take place out of each conjunct (hence it is not in accordance with the ATB requirement), is even worse than (59), where movement does take place out of each conjunct (in ATB fashion) (in (60) there are two moved elements and two gaps, while in (59) there are two moved elements and three gaps; the example mixes non-ATB ATB and ATB).

(59) *Which president do you wonder which famous writer John reads [articles about t], [essays by t], and [tweets from t] respectively?

(60) **Which president do you wonder which famous artist John reads [articles about t], [essays by t], and [tweets from Brady] respectively?

The contrast between (59) and (60) parallels in the relevant respect the contrast between between SC (25) and (26), indicating that the ATB requirement still holds in such cases. Both examples are, however, unacceptable. What seems to be going on here is that performing non-ATB ATB without coordination formation in the moved position leads to a violation, call it a violation of requirement X (to be discussed more below): X is violated in both (58) and (59). The reason why (60) is even worse is that it violates X as well as the ATB requirement that there needs to be movement out of each conjunct of a coordination.

Notice now that in (58), the wh-phrases that are moving out of the coordination are interpreted in different SpecCPs (i.e. different clauses). It is not out of question that this is the source of the ungrammaticality of (58); i.e. it may be that for some reason wh-phrases undergoing this kind of extraction must be interpreted in the same SpecCP, in which case (58) would not necessarily show that non-ATB ATB requires coordination formation in the moved position. This potentially interfering factor cannot be controlled for in English, but it can in SC, SC being a multiple wh-fronting language. Let us then test the possibility of non-coordinated non-ATB ATB with multiple wh-fronting in SC. The relevant examples are given below. (61), involving non-ATB ATB without higher coordination, is unacceptable. (62), its counterpart involving coordination in the higher position, is clearly better than (61).²¹

(61) *Prema kome_i za kim su podržali [otpor t_i] i [potragu t_j]?
to whom for whom are supported resistance and pursuit

(62) Prema kome_i i za kim su podržali [otpor t_i] i [potragu t_j]?
to whom and for whom are supported resistance and pursuit
'Resistance to whom and pursuit of who did they support?'

The interfering factor noted above with respect to English (58) also does not arise with respect to SC non-ATB ATB constructions discussed in section 3. These constructions also require coordination formation in the moved position, as shown by the contrast in (63), where (63a) involves coordination

²⁰Wh-island violations with D-linked wh-phrases are actually very weak; (58) is way worse than (i).

(i) ?Which president do you wonder why John reads articles about?

²¹Examples similar to (61), involving extraction of different elements from conjuncts without coordination in the higher position, were discussed in Kasai (2004), Citko (2003), and Zhang (2010) for Russian, Polish, as well as SC, and noted to be unacceptable. Note that (61) is unacceptable regardless of the placement of the clitic *su*. (62) gives the only possible clitic placement here (this also holds for (63)-(64), see section 3 for relevant discussion).

formation in the moved position and (63b) does not, as well as the contrast in (64), involving wh-counterparts of constructions like (63a-b), where the wh-phrases are interpreted in the same SpecCP.²²

- (63) a. Crvenu_i i bijelu_j je kupio [[t_i suknju] i [t_j haljinu]].
 red and white is bought skirt and dress
 ‘He bought a red skirt and a white dress.’
 b. *Crvenu bijelu je kupio suknju i haljinu.
- (64) a. Kakvu_i i čiju je ukrao [[t_i suknju] i [t_j haljinu]]?
 what-kind-of and whose is stolen skirt and dress
 ‘He stole what kind of a dress and whose skirt.’
 b. *Kakvu čiju je ukrao suknju i haljinu?

The data discussed in this section thus indicate that non-ATB ATB requires coordination formation in the moved position, i.e. the elements undergoing non-ATB ATB must participate in a coordination in their final position. (I will leave open here what this requirement may follow from).

Recall now the example noted in fn. 5, repeated here, which is unacceptable although, just like (13), it involves extraction (of different elements) from each conjunct. The issue here is that, in contrast to (13), which involves wh-movement out of each conjunct, (65) involves wh-movement out of the second and third, and head-movement out of the first conjunct.

- (65) *[Which book_i and which magazine_j] did_k [Mary t_k write a book], [John may buy t_i], and [Bill will read t_j] respectively.

If the ATB requirement simply requires that there is movement out of each conjunct, there is then no violation of the ATB requirement here. The ungrammaticality of (65) can, however, now be accounted for independently of the ATB requirement. We have seen above that when different elements are extracted out of conjuncts of a single ConjP they must participate in a coordination in the higher position. This is not the case with *did* in (65). The unacceptability of (65) then follows independently of the ATB requirement.

But there is a more general issue here. In English, distributed coordination is also possible with A-movement, as in (66) (*respectively* is not needed in (66)).

- (66) The dogs and the roosters barked and crowed all night. (Zhang 2010:170)

Japanese, however, does not allow constructions like (66) on the relevant reading, whereas SC patterns with English in allowing them, which can be taken to indicate that distributed coordination can be more restricted with A than with A'-movement, given that such constructions clearly involve the former.²³ Importantly, I am unaware of any language that allows it with head-movement, i.e. I am not aware of any language that allows examples like (67).

²²Notice that wh left-branch extraction, as well as multiple left-branch extraction, are in principle possible in SC (see Bošković 2016, Stjepanović 2018 and section 3).

²³Such crosslinguistic differences underscore the need for more in depth crosslinguistic investigations of the distributed extraction coordination construction, one of the main goals of this paper in fact being to spur such investigations.

(67) *Will_i, can_j, and must_k [John t_i buy a book], [Peter t_j sell a magazine], and [Mary t_k borrow a novel] respectively.

There may then be something more general about head-movement that disallows distributed coordinations involving head-movement. Interestingly, Kayne (1994) argues that head coordination is quite generally disallowed (see his work for evidence to this effect and discussion how traditional head coordination constructions should be treated). If distributed extractions require that extracted elements be coordinated, as argued above, and if head coordination is quite generally disallowed, as Kayne (1994) argues, it then follows that distributed coordinations with head-movement, as in (67), will be disallowed. The impossibility of distributed extraction involving head-movement can in fact be taken as another argument for the proposed coordination-in-the-moved position restriction on non-ATB ATB.

6. Islandhood

In this section I briefly note a locality effect associated with late coordination formation. SC allows extraction of conjuncts, as in (68) (see Stjepanović 2014a, 2020, Bošković 2017, Oda 2017).

(68) ?Knjige_i je Marko [t_i i filmove] kupio.
books is Marko and movies bought
'Marko bought books and movies.'

Such extraction is, however, disallowed with constructions under consideration: after formation of non-ATB ATB coordination, conjunct extraction is not possible:

(69) *Crvene_i tvrdiš da se [t_i i bijeli_j] meni dopadaju [t_i suknje] i [t_j kaputi].
red you-claim that self and white me_{DAT} please skirts and coats
'You claim that red skirts and white coats please me.'

While it is not trivial to implement this formally, intuitively it seems clear what is going on here: ConjP that is formed after movement, i.e. ConjP not located in the base position, is an island (such ConjP would in fact be a barrier in Chomsky's 1986 *Barriers* system).

In fact, not only conjunct extraction, but extraction out of a conjunct is also disallowed from a coordination formed by movement. This is shown by (70), involving ATB wh-movement out of a late-formed ConjP located in SpecCP, which is clearly worse than simple extraction out of interrogative SpecCP, as in (71).

(70) *Which famous president_i do you wonder [which paintings of t_i]_j and [which books about t_i]_k did he meet [fans of t_j] and [readers of t_k]?
(71) ?Which famous president_i do you wonder [which paintings of t_i]_j John sold t_j?

Late-formed coordinations are apparently islands, disallowing any kind of extraction, even extractions that are in principle possible out of regular (i.e. base-generated) coordinations.

7. When is late coordination formed?

While the primary goal of this paper is not to provide a full analysis of distributed extraction coordinations—it is simply premature to attempt something like that before the empirical domain of the

above facts indicate that regular movement must also be involved in the derivation of distributed coordinations (note that sideward movement obviates island effects, see Nunes 2004 and the discussion below) they do not necessarily mean that Zhang's sideward-movement analysis is fatally flawed. The late-formed ConjP can still be formed through sideward movement, as long as this ConjP is introduced into the structure earlier, not in the final position (e.g. within the same phase as the original ConjP, but this will be revised below), in which case the late-formed ConjP would be moving out of the island in (73), and the movement would bring the anaphor close enough to *John* in (74) to satisfy Condition A during the derivation. (This would still leave (75) unaccounted for; I will return to that example below—see the discussion of (93), which resolves the issue in question.) The modification of Zhang's analysis, on which distributed coordinations involve a combination of sideward movement and regular movement, as a result of which the higher coordination is formed earlier than on Zhang's analysis (though it is still formed during the derivation) is in the spirit of the well-known fact that in ATB constructions, there cannot be an island boundary between the edge of the second conjunct and the original extraction site within that conjunct, which under Nunes's sideward-movement analysis means that the relevant element needs to get to the conjunct edge, i.e. 'close' to its sideward movement site in the first conjunct. It is then not that surprising that the newly formed ConjP, which is also formed through sideward merger from the original ConjP under Zhang's analysis, cannot be indefinitely far from the original ConjP, which means that it should be introduced into the structure earlier, not in the final position.

Let us now address more closely the question of how close to the original ConjP, the late-formed (i.e. derivationally-formed) ConjP should be introduced. To address the question I will look at distributed coordination under A-movement. First, examples like (76) indicate that what is present in the θ -position of the relevant conjuncts (given the predicate-internal subject hypothesis) is not the *you and me* ConjP: only *you* is present in the θ -position of the first conjunct and only *me* is present in the θ -position of the second conjunct, given that each conjunct agrees separately in (76), in contrast to (77). These examples thus confirm that elements involved in distributed extraction coordinations start the derivation separately, as is expected given the interpretation of such constructions.

(76) He wants you and me to respectively go out of your mind and (go) out of my mind.

(77) cf. You and I are going out of our/*my/*your mind(s). (Postal 1998:161)

In (76) the conjuncts trigger agreement separately. In (78), on the other hand, they trigger it (in fact must trigger it, cf. (79)), jointly.

(78) A dog and a rooster were barking and crowing all night.

(79) *A dog and a rooster was barking and crowing all night.

This means that late coordination must be formed before subject-verb agreement is determined here. In light of this I will use such constructions as a diagnostic for determining when exactly the derivationally-formed coordination is inserted into the structure. I will consider the constructions discussed in this section under Chomsky (2000, 2001) approach to agreement, where agreement is established through the Agree relation holding between a probe and a goal, leaving it to the reader to verify that the conclusions reached below can also be maintained under e.g. Chomsky (1995) approach, where agreement is established in a Spec-Head relation (though with somewhat different derivations). Under the Agree analysis, when the relevant agreement relation is established ConjP must be located lower than T, so that T can probe it (which means T must c-command it).

Consider (78) in light of this. The relevant part of (78) can be derived as in (80) (only the relevant elements are shown in the structures below): we have a vP&vP coordination in the lower position, with

the subjects still not being conjoined with each other at this point. Another ConjP (what I have referred to above as late/derivationally-formed ConjP) is then formed through sideward movement (80b). Given that this ConjP must be higher than the θ -positions of the relevant elements, as discussed above (cf. (76)), and that it must be below T so that T can probe it, there must then be a phrase between vP and TP, with the late-formed ConjP (see (80b)) introduced into the Spec of this phrase (see (80c); I leave open the identity of this phrase, referring to it as XP below). T then probes the late-formed ConjP (80d), before the latter moves to SpecTP (80e).²⁵

- (80) a. [_{ConjP} [_{vP} a dog...] and [_{vP} a rooster ...]]
 b. [_{ConjP} [a dog] and [a rooster]]
 c. [_{XP}[_{ConjP} [a dog] and [a rooster]]] X [_{ConjP} [_{vP} ~~a dog~~...] and [_{vP} ~~a rooster~~ ...]]
 d. T [_{XP}[_{ConjP} [a dog] and [a rooster]]] X [_{ConjP} [_{vP} ~~a dog~~...] and [_{vP} ~~a rooster~~ ...]]
 | **Agree**
 e. [_{TP} [_{ConjP} [a dog] and [a rooster]]] T [_{XP}[_{ConjP} [~~a dog~~] and [~~a rooster~~]]] X [_{ConjP} [_{vP} ~~a dog~~...] and [_{vP} ~~a rooster~~ ...]]

Additional structure then needs to be present between T and vP so that the higher ConjP can be inserted into the structure outside of the lower ConjP but still below T (80c). This is straightforward in examples like (78), involving an auxiliary. It also needs to be the case in examples like (81).²⁶ I take this not to be an issue, given that many authors have anyway argued for additional structure between TP and vP even for examples like (81) (see Bošković 2015, Cinque 1999, Collins 2005, Merchant 2013, de Swart 1998, Ramchand and Svenonius 2013, Tenny 1992, among many others).

(81) A dog and a rooster barked and crowed all night.

Consider now a very interesting example in (82).²⁷

(82) John and Mary were hunting lions and were frightened by snakes respectively (Dougherty 1970)

What is interesting about this example is the discrepancy between agreement and interpretation within the conjuncts: what is interpreted in the relevant θ -position of the first conjunct is *John*, and what is interpreted in the relevant θ -position of the second conjunct is *Mary*. Yet, the agreement within the conjuncts is with *John and Mary*.²⁸ Let us see how this mismatch can be captured.

First, the lower coordination here must be on a higher level than in (78)—it cannot be a vP&vP coordination given that the auxiliary is present inside each conjunct. The auxiliary is plural (although what is interpreted as the subject of each conjunct is singular), which means that the auxiliary agrees with the late-formed ConjP. So, what has to happen here is that the auxiliary agrees with the late-formed ConjP, just as in (78), but the auxiliary must be within the lower ConjP, in contrast to (78).

²⁵Under the Spec-Head agreement analysis, there would be no need for XP since the late-formed ConjP could be inserted directly into SpecTP, with agreement taking place between T and the ConjP in SpecTP in a Spec-Head relation. (Certain constructions discussed below would, however, require the presence of XP even under this analysis, see fn 37.)

²⁶Plural agreement is not morphologically realized here in English, but it is in SC, where the verb is plural in (81).

²⁷Such examples were noted in Dougherty (1970), McCawley (1998), Postal (1998), and Zhang (2010).

²⁸In other words, the interpretation of the conjuncts is ‘John was hunting lions’ and ‘Mary was frightened by snakes’. Still, the agreement in (82) is plural.

Notice first that, quite independently of the issues under consideration here, there are two ways of analyzing such constructions, as noted in Bošković (2020). If only phrases can be coordinated, the subject and the auxiliaries cannot be located in the same phrase here, given that the subject is outside of the coordination and the auxiliaries are inside of the coordination—such examples would then provide evidence for a return to split Infl. (82) would then involve TP&TP coordination, with the subject undergoing ATB-movement out of each conjunct to the Spec of a higher projection, which for ease of exposition I will refer to as YP.²⁹ Alternatively, if traditional bar-level coordination is allowed, (82) can involve T'-coordination, with the subject undergoing ATB-movement from each conjunct to SpecTP. The choice between the two analyses is immaterial here, I will adopt the former for ease of exposition (the reader should bear in mind though that both analyses are compatible with the discussion below).

Consider then (82). The derivation will proceed similarly to (78), as shown in (83)-(86): *John* and *Mary* are inserted in their θ -positions, i.e. the positions where they are interpreted, separately (83). Late coordination is then formed (84), and inserted into SpecXP of each conjunct (85). Since XP is located lower than the auxiliary, each auxiliary will probe this ConjP, resulting in plural agreement on the auxiliary. The late-formed ConjP then undergoes ATB movement out of the coordination (86) (what is coordinated here is TP&TP, hence lower ConjP (ie. the ConjP that is not late-formed) dominates TP).

- (83) [_{VP} John hunting lions] b. [_{VP} frightened Mary by snakes]
(84) [_{ConjP} John and Mary]
(85) [_{TP} were-T [_{XP}[_{ConjP} John and Mary] X [_{VP} ~~John~~ hunting lions] and [_{TP} were-T [_{XP}[_{ConjP} John and Mary] _____] **Agree** X [_{VP} frightened ~~Mary~~ by snakes] _____] **Agree**
(86) [_{YP} [_{ConjP} John and Mary] [_{ConjP} [_{TP} [_{XP} [_{ConjP} ~~John and Mary~~] [_{VP} ~~John~~ hunting lions] and [_{TP} were-T [_{XP} [_{ConjP} ~~John and Mary~~] [_{VP} frightened ~~Mary~~ by snakes]

The example, which shows a mismatch between agreement and interpretation in the second conjunct, can then be accounted for. Now, looking at the structures in (80) and (86), we can see that the late-formed ConjP is inserted into the Spec of the first projection (not counting the lower ConjP in determining the first projection) above the position where the relevant elements are interpreted.³⁰ Such examples may then help us determine the timing of derivationally-formed coordination insertion into the structure (assuming that they are illustrations of a broader pattern): based on such examples I then tentatively conclude that the derivationally-formed ConjP is inserted into the first projection above the position where the relevant elements are interpreted—(this can even be within the original ConjP, in which case the derivationally formed ConjP is inserted in both conjuncts, undergoing regular ATB out of the lower ConjP). The precise locality condition—“the first projection”—in the above statement may end up being revised upon future scrutiny of distributed coordinations³¹—what is important here is that

²⁹ This would be AgrsP of early minimalism (Bošković in press in fact uses examples like *John travels to Rome tomorrow and will travel to Tokyo on Monday* to argue for a return to Split Infl (see also Cardinaletti 2004 and Rizzi 2006, among others).

³⁰ Above I have briefly alluded to an alternative analysis on which agreement is established in a Spec-Head relation. While for reasons of space I did not discuss this analysis, this conclusion also extends to the Spec-Head agreement analysis (although this analysis comes with different structural assumptions, see fn. 25).

³¹ A small adjustment will be made below to accommodate an additional step in the derivation of distributed coordinations discussed below. (I have assumed above that there is no vP in passives although there is some controversy regarding this issue. At any rate, what is important here is simply that the late-formed ConjP is inserted very close to the base positions of the relevant elements.)

the derivationally-formed ConjP is inserted very close to the positions where the relevant elements (i.e. its conjuncts) are interpreted.

The locality requirement in question may be what is responsible for the impossibility of cross-clausal late coordination formation, as in (87) (noted by S. Stjepanović, p.c.), where the *wh*-phrases come from different clauses, as a result of which the point of insertion of the derivationally formed coordination, which cannot be inserted before the higher *wh*-phrase is merged into the structure, is quite far from the position where the lower *wh*-phrase is interpreted.

- (87) *[Koji_i i kakvu_j] je [t_i momak] tvrdio da je [t_j djevojku] vidio?
which and what-kind-of is boy claim that is girl seen
'Which boy claimed that he saw what kind of a girl?'

The SC construction discussed in section 3 can help us become more precise regarding the derivation of non-ATB ATB constructions, the reason for that being that with left-branch extraction (LBE), which is employed in the SC construction in question, it is possible to introduce a locality/islandhood effect very close to the base-generation position of the relevant elements. But before we discuss that, one point needs to be emphasized. In any language I am aware of, only mobile elements can participate in ATB non-ATB constructions. The SC construction discussed in section 3 involves LBE, which is not possible in English, but is possible in SC. While non-ATB ATB involving LBE is possible in SC, as we have seen above, it is not possible in English (88a), a language which disallows LBE (88b).³²

- (88) a. *Red, Mary bought dresses
b. *Red and blue, Mary bought houses and dresses.

The effect in question is actually also illustrated with English (10), repeated here.

- (89) a. [Which nurse]₁ and [which hostess]₂ did Ernest sell cocaine to t₁, and George sell heroin to t₂, respectively?
b. *[Which nurse]₁ and [which hostess]₂ did Ernest sell t₁ cocaine and George sell t₂ heroin, respectively? (Postal 1998:135)
c. cf. Which nurse₁ did Ernest sell cocaine to t₁ (did Postal give this?)
d. *Which nurse₁ did Ernest sell t₁ cocaine?

As noted above, in contrast to the prepositional double object constructions (89c) the indirect object in DP DP double object constructions cannot undergo *wh*-movement (89d).³³ It also cannot participate in distributive extraction coordinations, as shown by (89b), which contrasts with (89a).

As another illustration of this effect, there are prepositions in English which disallow stranding:

- (90) a. Jerome tickled Marsha in that way.
b. *What way did Jerome tickle Marsha in?
c. cf. In what way did Jerome tickle Marsha?
d. Ernie did it for someone else's sake.

³² In this respect, note that Slovenian speakers generally disallow regular adjectival LBE and they also disallow it with distributed extraction coordinations of the kind discussed for SC here, which confirms that the mobility of the relevant elements matters.

³³ There is actually some speaker variation in this respect in British English, see Holmberg et al (2019).

- e. *Whose sake did Ernie do that for?
 d. For whose sake did Ernie do that? (Postal 1998:127)

Informally, we can consider the PPs in (90) to be barriers, which renders the P-complements in (90) immobile (note that the whole PP can move). Importantly, the same effect is found with the distributive extraction coordination in (91), which involve the PPs in question.

- (91) *What way_i and whose sake_j did Jerome tickle Marsha in t_i and Peter hugged Mary for t_j respectively?
 (92) cf. In what way_i and for whose sake_j did Jerome tickle Marsha t_i and Peter hugged Mary t_j respectively

The mobility requirement (which is essentially a locality-of-movement requirement) is surprising from the point of view of Zhang's sideward merger analysis. Sideward movement/merger was originally employed by Nunes to get around islandhood/locality effects (provided it takes place while the island is an independent root phrase, which will be the only derivation discussed below): sideward movement/merger out of a context that would induce a locality/islandhood effect voids that effect. Whatever locality/islandhood effect is involved in (88), (89b), and (90) (see, respectively, Bošković 2013a and Corver 1992, Douglas 2016 and Hornstein and Weinberg 1981, and Hornstein and Weinberg 1981 and Postal 1998, among others), sideward merger should be voiding it. What these facts then indicate is that the relevant elements undergo regular movement before sideward merger into another ConjP (i.e. there is a no-directly-from-the-interpreted-position restriction on derivational ConjP formation).

The parasitic gap constructions discussed above also require this movement. Consider again (93).

- (93) [Which secretary]₁ and [which programmer]₂ did Jerome respectively fire t₁ after finding t₁ drunk and hire t₂ after finding t₂ sober? (Postal 1998: 136)

As noted above, a parasitic gap is licensed by a moved wh-phrase that c-commands the parasitic gap. In accounts like Nissenbaum (2000) and Nunes (2004), it is not necessary for the wh-phrase to move to SpecCP to license a parasitic gap; movement to a lower position can do it. In fact, under Nissenbaum's account the wh-adjuncts in (93) are adjoined to their vPs, and the wh-phrases crucially need to move to adjoin to these vPs to license the parasitic gaps. This is the crucial step in parasitic gap licensing in this account. What is important for our purposes is that the wh-phrases need to undergo regular movement to license parasitic gaps within their conjuncts before undergoing sideward merger into ConjP in (93)—immediate sideward movement, as in Zhang's analysis, would not be sufficient for parasitic gap licensing. I then take the above facts to indicate that the relevant elements undergo regular movement before sideward merger into another ConjP.³⁴

The SC construction from section 3 can help us pinpoint the timing of regular and sideward movement. What is relevant here is that, in contrast to regular LBE as in examples like (21), what is in the literature referred to as deep LBE, illustrated by (95), is disallowed (see Corver 1992, Bošković 2005,

³⁴ The first-projection-locality-requirement on late-formed ConjP insertion discussed above should now be adjusted to take into consideration this short regular movement (it would be the first projection above the phrase where this short regular movement lands (or even within that phrase in some cases—I return to this issue below). At any rate, what is important is that the late-formed ConjP is inserted very close to the landing site of this movement.

2013a, Stjepanović 2014b, among others). With deep LBE, the nominal from which LBE takes places is a complement of another nominal.

- (94) Crvene_i sam vidio [t_i kuće]
 red am seen houses
 ‘I saw red houses.’
- (95) *Crvenih_i sam vidio [NP₂ vlasnike [NP₁ t_i kuća]]
 red am seen owners houses
 ‘I saw owners of red houses.’

For an account of the ungrammaticality of (95), the reader is referred to Bošković (2013a) and Corver (1992). The precise reasons for the grammaticality of (95) need not concern us here. What matters is that, as Corver (1992) and Bošković (2013a) show, the problem here arises with movement from NP1 to NP2 (there is no issue with movement out of NP1 per se (i.e. when the relevant NP is not dominated by another NP), otherwise even (94) would be unacceptable).

Bearing this in mind, the following data shed a crucial light on the timing of regular and sideward movement involved in ATB non-ATB.

- (96) ?Crvenih_i i plavih_j sam vidio [NP₁ vlasnike [ConjP [NP t_i kuća] i [NP t_j automobila]]]
 red and blue am seen owners houses and cars
 ‘I saw owners of [red houses and blue cars].’
- (97) *Crvenih_i i plavih_j sam vidio [ConjP[NP₁ vlasnike [NP t_i kuća] i [NP₁ ljubitelje [NP t_j automobila]]]
 red and blue am seen owners houses and fans cars
 ‘I saw [owners of red houses] and [fans of blue cars].’

There is a contrast between (96) and (97), which is particularly telling in light of the deep LBE effect from (95). The deep LBE effect is apparently still present in (97), but is voided in (96). What this means is that there is regular movement into NP1 in (97) but not in (96) (there are two NP1s, i.e. higher NPs, in (97) due to the level of coordination—cf. the translation of the examples). As discussed in Corver (1992) and Bošković (2013a) and briefly noted above, adjectives are base-generated at the very edge of the nominal domain in SC (this is what makes LBE possible in SC). Any movement from this position will take the AP into NP1 in (97); this movement is precisely what Bošković (2013a) argues causes a problem in (95). Crucially, in (96), there is a phrase, namely ConjP, in between the lower nominal domain and the higher NP (i.e. NP1). The AP can then undergo movement from its base-position without moving into the higher nominal domain in (96), in contrast to (97), namely by moving to the edge of ConjP. Stjepanović (2014a, 2020), Bošković (2017), and Oda (2017) provide independent evidence that movement to the edge of ConjP is in fact independently possible in SC. After undergoing this movement from their interpreted positions, the APs can then undergo sideward merger into the late-formed ConjP in (96). This late-formed ConjP should be inserted into the structure higher than the original ConjP (i.e. the indicated ConjP in (96)) given that, as Bošković (2013a) discusses, regular movement from the edge of the complement of N into the NP itself causes a locality violation in SC. Recall that, as discussed above, late-formed ConjP can be inserted into a phrase right above the original ConjP, which in this case is NP1. Since there is no regular movement from one NP domain into another there is then no locality violation.

The relevant derivations are mapped out below: simplifying what exactly happens here, I will simply assume that the complement of a noun is a barrier (the exact situation is more complicated (see Bošković 2013a, Corver 1992), but this suffices for our purposes—the relevant phrase (i.e. the

complement of the noun) is given in shadow red below). In (99), which corresponds to (97), regular movement (shown as movement of α) crosses a barrier, which induces a locality effect (in fact, the same effect as in (95)). In (98), which corresponds to (96), regular movement does not cross a barrier—only sideward movement crosses a barrier, but sideward movement voids locality effects (crossing here is metaphorical, sideward movement voids islandhood because it actually does not involve crossing of the island boundary: α is merged with β (forming a ConjP) in a separate derivational space, and then inserted into the position shown in (98)).^{35 36}

(98) [_{NP1} [$\alpha+\beta$] N1 [_{ConjP} α_i [_{NP} t_i (t_i in base-interpreted position of α)]

(99) *_{[NP1} [$\alpha+\beta$] [_{NP1} α_i N1 [_{NP} t_i]

Putting everything we have seen above together we can map out the derivation of non-ATB ATB constructions more generally. It is apparently not possible for the relevant elements to undergo sideward movement into late formed ConjP directly from the positions where they are interpreted. They have to undergo regular movement from that position, after which they can undergo sideward movement into the newly-formed ConjP. If a locality effect can be created right at the base-generated position, sideward movement will then not be able to obviate it (it would be taking place too late); but if the locality effect is created slightly higher than the base-generated position so that there is room for regular movement to

³⁵Slightly more complicated are examples like (32), which involve a mixture of non-ATB ATB and traditional ATB.

(i) Crvena_i i bijelij meni [_{t_i} suknja], [_{t_i} košulja] i [_{t_i} kaput] smetaju.
red and white me_{DAT} skirt, shirt and coat bother

Consider (i) under Nunes's (2004) sideward merger analysis of traditional ATB. Under this analysis and the current analysis of distributed coordinations, (i) is derived as follows: "white" is merged with "coat"; "red" is merged with "shirt" and then undergoes sideward merger with "skirt" (this is regular ATB). Both "red" and "white" then move to the edge of the lower ConjP, after which derivational coordination formation takes place, with "red" and "white" undergoing sideward merger that forms what I have called late-formed ConjP (note that only derivational ConjP formation is subject to the not-directly-from-the-interpreted-position restriction).

³⁶Note that examples like (i), involving non-ATB ATB from NPs involving multiple adjectival modification, are disallowed.

(i) *_{[ConjP} [Skupe_i stambene_j] i [stare_k željezničke_i]] sam vidio [_{ConjP} [_{t_i} _{t_j} zgrade] i [_{t_k} _{t_l} mostove]]
expensive_{fem} residential_{fem} and old_{masc} railway_{masc} am seen buildings_{fem} and bridges_{masc}

'I saw expensive residential buildings and old railway bridges.'

This is not surprising. Two factors are relevant here. First, even regular LBE is not possible in this context (see Bošković 2005).

(ii) *Skupe_i stambene_j je vidio [_{t_i} _{t_j} zgrade].
expensive residential is seen buildings

Second, under all analyses of multiple adjectival modification of a single noun, such adjectives do not form a constituent. It is then not surprising that such adjectives cannot form a single conjunct (in fact, coordination is standardly taken to be a constituency test).

There might be another issue here: for some speakers even single adjectives are degraded in non-ATB ATB if they originate in an NP with multiple adjectives.

(iii) *_{[ConjP} Crvene_i i plave_j] sam vidio [_{ConjP} [_{t_i} stambene zgrade] i [_{t_j} željezničke mostove]].
red_{fem} and blue_{masc} am seen residential_{fem} buildings_{fem} and railway_{masc} bridges_{masc}

Single AP regular LBE is in principle possible in such cases. It is, however, heavily restricted, and often requires special intonation (see Bošković 2005). It is possible that for the speakers in question, this is an interfering factor here (essentially, separate emphatic focus is required for each fronted adjective—this has been argued not to be possible and to underlie the crosslinguistic impossibility of multiple contrastive focus movement).

take place before the locality effect can kick in, the locality effect gets obviated through sideward movement. Any locality effect higher up, i.e. higher than the point of insertion of the late-formed ConjP, which we have seen is still inserted pretty close to the positions in which the relevant elements are base-generated, will still be in effect, due to the movement of the late-formed ConjP itself. All of this is mapped out in (100). (The brackets where a locality effect could in principle pop up due to regular, not sideward, movement crossing it are given in shadow red. For ease of exposition, I use a trace for the movement that precedes formation of the derivationally-formed ConjP, and a struck-out copy for the movement of the derivationally-formed ConjP itself. Two phrases are given between the final landing site and the original position of the movement of the derivationally-formed ConjP merely to indicate that this movement is generally longer than the movement that α alone undergoes, which is generally very short.)

(100) $[\alpha+\beta]_j$ [WP ... [ZP [~~$\alpha+\beta$~~]_j] [_{YP} α_i [~~XP~~ t_i]

Regarding locality effects seen above, the locality effect in (97) arises due to the crossing of the redDED XP between α_i and t_i in (100), which means with movement of the element that will later participate in late coordination ((96) crucially differs from (97) in that that step of movement in (96) does not cross a barrier; it essentially takes place below XP in (100) due to the presence of additional structure in (96)). The locality effect in (73), on the other hand, arises due to the crossing of a redDED phrase between $[\alpha+\beta]_j$ and $[\alpha+\beta]_j$ in (100), which means with movement of the late-formed coordination itself. The reconstruction effect in (74) also occurs on the path between $[\alpha+\beta]_j$ and $[\alpha+\beta]_j$. Regarding agreement effects, if agreement takes place below ZP in (100), which means below $[\alpha+\beta]_j$ (see (100)), it will involve agreement with an individual conjunct, i.e. α . This is the case with (76) (and with SC A-N agreement). On the other hand, if it takes place above ZP, it will involve agreement with the whole ConjP, i.e. $[\alpha+\beta]$, which is the case with examples like (78) and (82).³⁷

Importantly, the facts discussed above indicate that islandhood/locality effects are selectively present with non-ATB ATB constructions. In most cases they are present, but in some cases they are voided. This could not be captured if we were to simply adopt Zhang's analysis, where the relevant elements undergo sideward movement into the late-formed ConjP straight from their interpreted position, with the late formed ConjP inserted in the final landing site—no locality effects should then be present at all (all the examples in (30), (57), (73), (88b), (91) and (97) are thus problematic for this analysis). We also could not capture the state of affairs depicted above if the relevant elements were to

³⁷The derivations of examples (78) and (82) given above can be easily adjusted to accommodate the movement from the interpreted position prior to sideward merger into the late-formed ConjP. Regarding (82) (cf. the derivation in (83)-(86)), one possibility is that there is a projection between XP and VP, with the relevant elements moving to that projection within their respective conjuncts prior to sideward movement (i.e. prior to step (84)). There is, however, another possibility which does not require an additional projection: the individual conjuncts, *John* and *Mary*, undergo separate movements to Specifiers of XP in (85) prior to the late-formed ConjP insertion, with this ConjP inserted into the higher Specifier of XP (note that the Spec-Head Agreement analysis, briefly discussed in fn. 25, would also require a projection between VP and TP to accommodate the regular movement that precedes sideward merger into the late-formed ConjP). As for (78) (cf. the derivation in (80)), assuming that it is not possible for different elements to undergo movement out of a ConjP (so sideward movement is needed to obviate the locality effect), *a dog* and *a rooster* would move separately to the edge of ConjP if movement to the edge of ConjP is also allowed in English, or, if this is not possible in English, (78) would involve coordination on a slightly higher level (than vP in (80a)), with *a dog* and *a rooster* moving to the edge of the projection that undergoes coordination prior to undergoing sideward movement into the late-formed ConjP. Further research is needed to tease apart the options in question.

undergo regular movement from their interpreted position all the way to their final landing site, with the late-formed ConjP formed there. E.g., having in mind examples like *And then Ann left*, where the complement of *and* is a non-coordinated CP, one could imagine an alternative to the sideward merger analysis on which the Conj head takes the whole CP as its complement. Assuming that the coordinated phrases have to move into ConjP, (6) could then be analyzed in terms of ConjP shells, as in [_{ConjP} which book and_i [_{ConjP} which magazine t_i [_{CP} ..]]].³⁸ On such an analysis locality effects would never be obviated ((96) is thus problematic for this analysis). On the other hand, the selective presence of locality effects can be captured on an analysis which essentially combines the two accounts just noted, on which there is both regular movement and sideward movement involved in the derivation of non-ATB ATB constructions. We have seen that such an analysis can also capture agreement effects found with non-ATB ATB constructions as well as the mobility requirement on the elements involved in non-ATB ATB and the ability of these elements to license parasitic gaps on their own.

8. Conclusion

This paper has provided additional evidence that it is possible to move different elements from conjuncts involved in the same coordination and that such constructions involve coordination formation in a non-base generated position, i.e. after movement (cf. Zhang 2010). It was shown that such constructions are also subject to the ATB requirement: although different elements are moving out of conjuncts movement still must take place out of each conjunct. This means that the traditional ATB requirement needs to be reformulated: it is not the case that the moving element must move out of each conjunct but simply that movement must take place out of each conjunct. It can be the same element that is moving out of each conjunct or different elements; the ATB requirement is satisfied as long as there is movement out of each conjunct (furthermore, the ATB requirement does not hold across ConjPs). Traditional ATB, where the same element moves out of more than one conjunct, and what I have referred to as non-ATB ATB, where different elements are moving out of the conjuncts, can in fact be mixed under extraction out of the same coordination, as expected if all that is needed is that there is movement out of each conjunct. Furthermore, mixed non-ATB ATB cases have the same ordering restrictions (regarding the order of the conjuncts) as pure non-ATB ATB cases. We have also seen that there is a restriction on non-ATB ATB, where different elements are moving from different conjuncts, in particular, non-ATB ATB requires coordination formation in the moved position. Additionally, head-movement cannot be involved in non-ATB ATB, which in fact follows from the coordination-in-the-moved-position requirement if head coordination is disallowed, as Kayne 1994 argued. I have also discussed the precise timing of derivational coordination formation, concluding that the late-formed coordination is inserted into the structure very close to the phrase where the relevant elements are interpreted (under sideward movement analysis of distributed coordination), not in the final position of the relevant elements (as in Zhang 2010). The relevant elements, however, first need to undergo regular movement from the positions where they are interpreted: they cannot undergo sideward merger into the derivationally-formed ConjP straight from the positions where they are interpreted: The derivation of non-ATB ATB constructions then involves both regular and sideward movement.

Appendix: On the typology of late coordination constructions

Above we have seen a number of cases involving coordination formation in the moved position, i.e. after movement. All these cases also involve coordination in the lower position, i.e. they involve extraction out of a coordination. A question arises if late coordination formation is possible without coordination

³⁸If there are more than two conjuncts, the higher ConjP can have multiple Specs, or there can be additional ConjP shells.

in the lower position, i.e. if the relevant movements do not take place out of a ConjP. Citko and Gračanin-Yukseš (2013) argue that it is. They consider constructions like (101) and argue that crosslinguistically they can involve either larger (i.e. clausal) coordination where only the *wh*-phrase is realized in the first conjunct, which they argue is the case with English (101), or coordination of *wh*-phrases, which they argue is the case with Bulgarian (102).

(101) What and where did you eat?

(102) Koj and kakvo e kupil?
who and what is bought
'Who bought what?'

They furthermore argue that *wh&wh* coordinations like (102) involve coordination formation after movement (analyzing it in fact in terms of sideward movement, following Zhang 2010).³⁹ Thus, they observe that in English, it is not possible to have obligatory arguments in the coordination in question, as (103) shows. This is expected under the clausal coordination analysis, where (101) is treated as involving coordination of two clauses, *what did you eat and where did you eat?*

(103) *What and where did you buy?

The acceptability of (102) then indicates that we are dealing here with *wh&wh*, rather than clausal coordination.⁴⁰

Citko and Gračanin-Yukseš also observe that coordinations like (102) are not possible with *wh*-phrases in situ. In fact, it is quite generally not possible to coordinate a subject and an object of the same clause, which means that (102) cannot involve base coordination that would then undergo movement. In other words, the coordination here can only be formed after movement.

Note also that, like distributed coordinations, *wh&wh* coordinations are sensitive to islandhood, as shown by Bulgarian (104), involving an adjunct island (note that Bulgarian does not show Comp-trace effects).

(104) *Koj i kakvo si jadosan zaštoto e kupil?
who and what are angry because is bought
'You are angry because who bought what?'

At any rate, if Citko & Gračanin-Yukseš's account of Bulgarian (102) is correct, such examples provide evidence that late coordination formation is not limited to constructions involving movement out of a coordination.

³⁹ I will use the term (non-distributed) *wh&wh* coordination to refer to constructions which involve coordination of *wh*-phrases (not a larger constituent) and where the *wh*-phrases are not extracted out of a coordination. For ease of exposition, to differentiate such cases from examples like (6), where there is a lower ConjP, I will refer to the latter as (Postal-style) distributed coordinations.

⁴⁰ Furthermore, Gračanin-Yukseš (2007) note that *wh*-DP external material can occur within the relevant ConjP in English, as shown by (i). Nothing of that sort is possible in Bulgarian. (Note that SC allows both obligatory arguments and DP-external material in the coordinations in question, as shown by (43)-(44), the reason for this being that SC allows both *wh&wh* and larger clausal coordination, see Citko and Gračanin-Yukseš 2013 (I am simplifying their discussion here) and the discussion below.)

(i) What did Peter and why did Peter eat?

(Gračanin-Yukseš 2007)

Notice furthermore that given that the structure instantiated by Bulgarian (102) is apparently not allowed in English, the availability of non-distributed wh&wh coordinations, which, if Citko and Gračanin-Yuksek (2013) are right in their treatment of such coordinations involve late coordination formation without movement out of a coordination, should not be tied to the availability of constructions like (6) (which involve coordination in the lower position, i.e. late coordination formation out of a coordination), in a sense that the availability of the latter would imply the availability of the former (though SC happens to allow both, see below).

It should, however, be noted that the former (i.e. non-distributed late coordination) is possible only under wh-movement, as shown by SC (105) (the fronting in (105a) can in principle involve topicalization, focalization, or scrambling (see Bošković 2004), the construction is apparently ruled out regardless of which of these options is taken, in contrast to (43)).

- (105) a. *Jovanu i knjigu daju.
 Jovan_{DAT} and book_{ACC} they-are-giving
 ‘They are giving Jovan a book.’
 b. *Jovan i kuću kupuje.
 Jovan_{NOM} and house_{ACC} is-buying
 ‘Jovan is buying a house.’

Postal-style distributed coordinations are not restricted in this way. Thus, they are possible with other A’-movements, as shown by (106) or even with A-movement, as discussed above (cf. (66), though there is crosslinguistic variation in this respect, as noted above).⁴¹

(106) Under the pillow and in the drawer Lulu put the diary and hid her letters, respectively (Zhang 2010:170)

Given that there clearly must be rather strong additional restrictions on non-distributed wh&wh coordinations, which are not operative with Postal-style distributed coordinations, it is not out of question that the unavailability of the former in English (in contrast to the availability of the latter) is due to those additional restrictions, i.e. that we are not dealing with a deeper point of variation in this case, where English would allow late coordination formation only out of another coordination. (Recall that SC allows it regardless of whether late coordination formation takes place out of a coordination or not.) Rather, more construction-specific issues could be involved.

⁴¹ In SC, Postal-style wh-movement distributed coordinations are actually more restricted than in English. One issue could be that SC does not have a real counterpart of *respectively* that is used in such cases in English. What is happening in SC is that (possibly due to the lack of ‘respectively’ or the possibility of wh&wh coordinations), the non-distributed reading on which the coordination of wh-phrases undergoes ATB-movement from each object position is the only reading in the counterpart of (6) in SC.

(i) [Kuju knjigu i koji magazin]_i je Jovan kupio t_i i Ivan prodao t_i?
 which book and which magazine is Jovan bought and Ivan sold
 ‘Which book and which magazine did John buy and Ivan sell?’

However, when such non-distributed ATB-movement parse is not possible, as in (62), Postal-style distributed coordination is available with wh-phrases in SC. It is also marginally available in constructions more similar to (i) where the pragmatics increases the saliency of the distributed reading (with a different coordinator though).

(ii) ?Koliko jela i koliko pisama je Marija napravila a Ivan napisao?
 how-many dishes and how-many letters is Maria made and Ivan wrote
 ‘How many dishes and how many letters did Maria make and Ivan write?’

Citko and Gračanin-Yuksek (2013) in fact tie the availability of wh&wh coordination to the availability of multiple wh-fronting: since English does not have multiple wh-fronting it cannot then have the structure in question. However, it is not clear why multiple wh-fronting should be relevant here. Under Citko and Gračanin-Yuksek's analysis, the interrogative C in (102) has only one Spec, which is filled by ConjP.

There are additional reasons why the availability of (102) should not be tied to multiple wh-fronting. Thus, as another argument for the wh&wh (as opposed to clausal) coordination account of Bulgarian (102), Citko and Gračanin-Yuksek (2013) observe that such constructions show Superiority effects, i.e. strict ordering of coordinated wh-phrases. They argue that this would not be expected if (107) involves coordination of two clauses, where each clause has only one wh-phrase, which undergoes movement.

- (107) a. Koj i kakvo e kupil?
 who and what is bought
 b. *Kakvo i koj e kupil?

Citko and Gračanin-Yuksek (2013) argue that what is relevant here is that Bulgarian is a multiple wh-fronting language. Multiple wh-fronting languages differ regarding whether they show superiority effects under multiple wh-fronting (see for example Rudin 1988, Bošković 2002). Bulgarian does show such effects (see (108)), just as it does with wh&wh coordinations (see (107)).

- (108) a. Koj kakvo e kupil?
 who what is bought
 ‘Who bought what?’
 b. *Kakvo koj e kupil?

In light of this, Citko and Gračanin-Yuksek (2013) tie the possibility of wh&wh coordinations to multiple wh-fronting. The correlation is, however, rather difficult to maintain. Under the standard account the superiority effect in (108) arises as a result of the interrogative C attracting two wh-phrases, where these wh-phrases undergo separate wh-movements, occupying separate CP Specs. This is, however, not the case with (107) under Citko and Gračanin-Yuksek's (2013) analysis, where the coordination of wh-phrases (i.e. ConjP dominating the wh-phrases) is merged into SpecCP—there are no two separate wh-movements or two CP Specs in (108). Furthermore, Citko and Gračanin-Yuksek (2013) also observe that some speakers of Bulgarian do allow free ordering of the coordinated wh-phrases in (107). On the other hand, there is no speaker variation regarding superiority effects with multiple wh-fronting.

Also relevant here is SC, which does not show matching in the ordering of wh-phrases in simple multiple wh-fronting constructions and wh&wh coordinations. As noted above, multiple wh-fronting languages differ regarding whether or not they show superiority effects in examples like (108). Thus, as discussed in Rudin (1988) and Bošković (2002), SC does not show Superiority effects in simple multiple wh-fronting constructions like (109).

- (109) a. Ko šta kupuje?
 who what is-buying
 ‘Who is buying what?’
 b. Šta ko kupuje?

However, SC does show ordering effects with wh-coordinations.⁴²

- (110) a. Ko i šta kupuje?
 who and what is-buying
 b. *Šta i ko kupuje?

Now, as discussed above, SC also allows larger coordinations involving wh-phrases, as indicated by the fact that additional material can be present within what appear to be wh&wh conjuncts.

- (111) Ko je i šta (je) kupio?
 who is and what is bought
 ‘Who bought what?’

The presence of the auxiliary clitic in (111) indicates that the first conjunct is actually a clause. Interestingly, such constructions, which unambiguously involve coordination that is larger than wh&wh, do not show superiority effects.⁴³

- (112) Šta je i ko (je) kupio?
 what is and who is bought

When there is nothing following the first wh-phrase there is a superiority effect, as shown by (110).⁴⁴ On the other hand, when the clitic follows the first wh-phrase, which clearly shows that in such cases the first conjunct is larger than the wh-phrase itself, there is no superiority effect (see (111)-(112)). These data indicate that when there is no additional material following the first wh-phrase we are indeed dealing with a wh&wh coordination.⁴⁵ These facts also indicate that there is no parallelism between Superiority

⁴²(110b) improves if there is a pause following the first wh-phrase, which is not necessary in (109b). For the relevance of this prosodic pattern, which I put aside in the text, see footnote 45.

⁴³There may be a null subject in the first conjunct and a null object in the second conjunct here. SC is a pro-drop language so the former is not surprising. On null objects in similar constructions, see Zanon (2015) and references therein (for other perspectives on these issues, see Citko and Gračanin-Yuksek 2013, Gračanin-Yuksek 2007).

⁴⁴The same holds if the clitic follows the coordinated wh-phrases.

- (i) a. Ko i šta je kupio? b. *Šta i ko je kupio?
 who and what is bought

⁴⁵This in itself is rather interesting. We may be dealing here with an economy of representation effect (see Bošković 2011 and references therein): when both a smaller and a larger structure are in principle available for X, if there is no evidence for the larger structure X is analyzed in terms of the smaller structure. (We would not necessarily expect to find this effect in all languages of this sort since the effect would hold only in an all-else-being-equal scenario, which is not always the case; e.g. lexical properties of elements that are elided on the larger structure option could block the effect—see Bošković 1997.) There may, however, be another factor at work here. Recall that, as noted in footnote 42, (110b) improves if there is a pause following the first wh-phrase. It may then be that wh&wh and clausal coordination are associated with two distinct prosodic patterns in the cases where nothing intervenes between the coordinated wh-phrases, the prosodic pattern with a pause following the first wh-phrase reflecting clausal coordination structure. This prosodic pattern is forced by a superiority violation, which is not allowed under the wh&wh derivation. It should be noted that according to Citko and Gračanin-Yuksek, there is no superiority effect in wh&wh coordinations in Croatian. The speakers I have consulted, all of which come from Bosnia, do show a superiority effect here (in fact all the data discussed above come from the Bosnian variety of what I have referred to as SC). It is not out of question that there is no real variation here, and that Citko and Gračanin-Yuksek were checking the prosodic pattern associated with clausal coordination (this may also be

effects in simple multiple wh-fronting constructions and wh&wh constructions, given the contrast between (109) and (110) (more precisely, (109b) and (110b)), i.e. the parallelism shown by Bulgarian (108) and (107) is accidental.

In fact, there is reason to believe that whatever is going on with the ordering of wh-phrases in wh&wh coordinations is different from superiority effects with multiple wh-fronting. As discussed in Bošković (2002), quite generally when the superiority effect is found with multiple wh-fronting it holds only for the first and the second wh-phrase; beyond that the ordering of the wh-phrases is free. This is shown by Bulgarian (113): when only two objects undergo wh-movement, the indirect object must precede the direct object, a superiority effect given that the former is higher than the latter prior to wh-movement. However, when a higher wh-phrase is present, the ordering of the indirect and direct object is free (the nominative must be first in (113c-d) as well as (114c) and (115) below). The same point is illustrated by SC (114), where the superiority effect also holds only for the first and the second wh-phrase (see Bošković 2002 for discussion of the superiority effect in (114a-b)).⁴⁶

- (113) a. Kogo kakvo e pital Ivan?
 whom what is asked Ivan
 ‘Who did Ivan ask what?’
 b. ?*Kakvo kogo e pital Ivan?
 c. Koj kogo kakvo e pital?
 who whom what is asked
 ‘Who asked whom what?’
 d. Koj kakvo kogo e pital? (Bošković 2002:366)

- (114) a. ?Ima kome kako da pomogne.
 has whom how part helps
 ‘(S)he has someone to help somehow.’
 b. *Ima kako kome da pomogne.
 c. ?Ima ko kako kome da pomogne.
 has who how whom part helps
 ‘There is someone who can somehow help somebody.’ (Bošković 2002:367)

Recall now that SC shows an ordering effect with wh&wh coordinations involving two wh-phrases. However, the ordering effect here extends to all wh-phrases: when there are more than two wh-phrases there is strict ordering between all of them, as shown by (115).

- (115) a. Ko kome i šta daje?
 who whom and what is-giving
 ‘Who is giving what to whom’
 b. *Ko šta i kome daje?
 who what and whom is-giving

behind what they report as speaker variation regarding the ordering effect in Bulgarian; while Citko and Gračanin-Yuksek do not give relevant Croatian data they do give superiority-violating examples from Russian. However, it turns out that superiority violations in Russian are possible only under the prosodic pattern associated with clausal coordination). At any rate, while the issue under consideration is quite interesting, it goes beyond the scope of this paper, whose focus is on distributed coordinations, hence I put it aside here for future research that will focus on wh&wh coordinations.

⁴⁶As discussed in Bošković (2002), SC shows superiority effects in certain contexts; one such context is the context given in (114).

The data discussed above indicate that the ordering effect found with wh&wh coordinations is independent of Superiority (more precisely, what is considered to be superiority effects associated with multiple wh-fronting).⁴⁷

That the ordering effect found in late coordination formation constructions, which holds in all types of such constructions discussed in this paper (see fn 47), should be dissociated from ordering/superiority-style effects found with multiple wh-fronting is confirmed quite strongly by certain data regarding multiple left-branch extraction discussed by Stjepanović (in press). Although SC generally does not show superiority effects with simple multiple wh-fronting constructions (there are contexts where SC does show such effects, see Bošković 2002), Stjepanović shows that if multiple wh-fronting involves multiple left-branch extraction it does show ordering effects, as illustrated below. (An intervening element is added in (117) to make sure that there is left branch extraction from the subject. Stjepanović in press shows that several factors are relevant in such cases, including agreement patterns between the extracted left-branch and the remnant.)

- (116) *Čiji_i kakva_j [t_i otac] kupuje [t_j kola]?
 whose what-kind-of father is-buying car
 ‘Whose father is buying what kind of a car?’
- (117) Kakva_i čiji_j danas [t_j otac] kupuje [t_i kola]?
 what-kind-of whose today father is-buying car
 ‘Whose father is buying what kind of a car today?’

Importantly, wh&wh coordinations do not match multiple wh-fronting constructions in the relevant respect.

- (118) Čiji_i i kakva_j [t_i otac] kupuje [t_j kola]?
 whose and what-kind-of father is-buying car
 ‘Whose father is buying what kind of a car?’
- (119) *Kakva_i i čiji_j [t_j otac] kupuje [t_i kola]?

As noted above, Citko and Gračanin-Yukseš (2013) take the superiority parallelism between Bulgarian (108) and (107) to indicate that the availability of multiple wh-fronting underlines the availability of wh&wh coordinations (which, recall, involve late coordination formation). The fact that, as shown above, wh&wh coordinations do not track multiple wh-fronting with respect to Superiority suggests that the two should be divorced. There should then be no connection between multiple wh-fronting and the possibility of late coordination formation (which underlines the possibility of Postal-style distributed coordination—this is desirable given the possibility of the latter in English).

⁴⁷In this respect, wh&wh coordinations pattern with Postal-style distributed extractions, where, as discussed in section 3, there is also an ordering effect (the order of the conjuncts within the newly formed ConjP must match the order of the conjuncts from which extraction takes place in the original ConjP), which in the cases involving three conjuncts holds for all conjuncts, as shown by SC (40) (repeated below), which gives the only possibility for the interpretation of the extracted adjectives. (The same holds for English distributed coordination constructions, as shown by (41).)

(i) Crveni_i, bijeli_j i šareni_k meni [t_i sako], [t_j kaput] i [t_k šešir] smetaju.
 red white and colorful me_{DAT} jacket coat and hat bother
 ‘The red jacket, white coat, and colorful hat bother me.’

At any rate, there is crosslinguistic variation regarding non-distributed wh&wh coordinations, whose availability should not be tied to either the availability of multiple wh-fronting or Postal-style distributed coordination in the language.

While the issues discussed in this appendix merit a much more extensive scrutiny than they could be given in this appendix, whose scope is rather limited, what we are seeing here is that languages differ with respect to how they behave regarding the relevant properties of coordinate constructions. The point of the above discussion was merely to outline some of the possible crosslinguistic variation in the relevant domain, as well as to highlight the need for more extensive crosslinguistic investigations of the relevant properties of coordinations (recall that languages also differ regarding whether they allow conjunct extraction, see for example SC (68), which is unacceptable in English). Hopefully, such investigations will reveal correlations between the properties of coordination investigated in this paper and other properties, which should help determine in a more principled way the factors that are behind the phenomena (and the variation with respect to these phenomena) discussed in this paper.

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