Shen, Zheng. 2023. Conjunction Agreement and the Coordinate Structure Constraint. *Glossa: a journal of general linguistics* 8(1). pp. 1–32. DOI: https://doi.org/10.16995/glossa.6382

Conjunction Agreement and the Coordinate Structure Constraint

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A long-standing question in syntax is what role linear order plays in a hierarchical grammar. Phenomena that on the surface show sensitivity to linear order have been particularly illuminating. When agreeing with coordinated subjects with different gender features, participles in Bosnian-Croatian-Serbian (BCS), Slovenian, and other languages allow multiple options including agreeing with the linearly closest conjunct. This pattern motivated an analysis where linear order can play a role in a syntactic operation such as agreement (Marušič et al. 2015; Willer-Gold et al. 2016 among others). On the other hand, Murphy & Puškar (2018) show that the pattern can be accounted for without resorting to linear order. This paper provides novel evidence from Coordinate Structure Constraint violating movement in BCS to argue for the non-linear approach. If the argument is on the right track, agreement can be kept within syntax without resorting to PF conditions.

1 Introduction

Sentences in human languages are organized hierarchically while sentence production and perception is conducted in a linear manner. Whether linear order plays a role in the hierarchical syntax is a long-standing question, one which requires paying careful attention to phenomena that appear to be sensitive to linear order. This paper contributes to this question by looking into such a phenomenon, namely, conjunction agreement in Bosnian-Croatian-Serbian (BCS). I will show evidence in support of the analysis where linear order does not play an obvious role in grammar.

When agreeing with coordinated DPs, multiple options have been observed across languages, including agreement with the linearly closest conjunct. A set of such conjunction agreement strategies in South Slavic languages has been verified by recent experimental studies (Marušič et al. 2015; Willer-Gold et al. 2016; Willer Gold et al. 2018; Arsenijević et al. 2020b; Marušič & Shen 2021 among others). This paper will focus on gender agreement on participles (PART) in Bosnian-Croatian-Serbian (BCS). BCS has a three gender system with feminine (F), masculine (M), and neuter (N). PART shows gender and number agreement with the subject while the auxiliary verbs show number and person agreement. In BCS, the order of the subject and PART is flexible. The conjunction subject precedes the PART in sentences in (1) and follows PART in sentences in (2). The masculine gender has a default status in BCS, namely, masculine agreement is available in cases where none of the subjects has masculine gender. In order to make sure that the agreement marking unambiguously reflects different agreement strategies, a conjunction of a neuter and a feminine subject will be used in all the sentences throughout the paper. To avoid possible interaction between number agreement and gender agreement (see Marušič et al. 2015 for discussion), all conjunct subjects are plural.[1]

Based on previous literature, PART can show agreement with the first conjunct (C1), the second conjunct (C2), or masculine agreement (M) in the subject-PART order as shown in (1). In the PART-subject order in (2) on the other hand, PART can show C1 and masculine agreement but not C2 agreement.[2,3]

[1] As a reviewer pointed out, the two approaches engaged in this paper make distinct predictions of agreement patterns available when both conjuncts are singular. I will leave the exploration of such predictions to future research.

[2] The empirical status of masculine agreement in PART-subject order is subject to variation. In the elicitation experiments by Willer-Gold et al. (2016), it is observed that speakers tend not to produce masculine agreement in the PART-subject order (cf. Slovenian data from Marušič et al. (2015)). However, Murphy & Puškar (2018) reports it to be a viable option. Bošković (2009) acknowledges the contrast between masculine agreement in the two orders while categorizing them both as acceptable. As will be shown, speakers who participated in my surveys accepted masculine agreement in the PART-subject order, therefore I will label it as acceptable while acknowledging the complication in the literature. It will be made clear that what is crucial in this paper is that for the same group of speakers, masculine agreement is not available once the first conjunct moves away.

[3] The analysis of masculine agreement in conjunction in BCS and other Slavic languages is not without disagreement. Some analyze it as the default value while others claim it to result from gender resolution. Thus I will use the descriptive term *masculine agreement* in this paper. See Willer-Gold et al. (2016); Marušič & Shen (2021) for detailed discussion.

(1) subject-PART: [C1 and C2] $\text{PART}_{M/C1/C2}$

a. Sva odela i sve haljine su juče prodati.
[All suits.NPL and all dresses.FPL] AUX yesterday sold.**MPL**

b. Sva odela i sve haljine su juče prodata.
[All suits.**NPL** and all dresses.FPL] AUX yesterday sold.**NPL**

c. Sva odela i sve haljine su juče prodate.
[All suits.NPL and all dresses.**FPL**] AUX yesterday sold.**FPL**
"All suits and all dresses were sold yesterday."

(2) PART-subject: $\text{PART}_{M/C1/*C2}$ [C1 and C2]

a. Juče su prodati sva odela i sve haljine.
yesterday AUX sold.**MPL** [all suits.NPL and all dresses.FPL]

b. Juče su prodata sva odela i sve haljine.
yesterday AUX sold.**NPL** [all suits.**NPL** and all dresses.FPL]

c. *Juče su prodate sva odela i sve haljine.
yesterday AUX sold.**FPL** [all suits.NPL and all dresses.**FPL**]
"All suits and all dresses were sold yesterday."

The analyses of these agreement options can be categorized into two approaches. Marušič et al. (2015); Willer-Gold et al. (2016) (see also Bhatt & Walkow 2013) propose a system where the Agree operation can target the linearly closest conjunct. In other words, linear order plays a role in syntactic operations like Agree. I will label this approach *the linear approach*. On the other hand, Murphy & Puškar (2018) argue that the patterns in (1)–(2) can be accounted for without making reference to linear order. Instead, the apparent sensitivity to linear order results from the ordering of Agree and Merge. I will label it as *the non-linear approach*.

Although Murphy & Puškar (2018: p1218) argue that an analysis where agreement is confined to syntax proper is conceptually desirable, both approaches cover the same empirical ground as in (1)–(2). The current paper provides empirical support for the non-linear approach from Coordinate Structure Constraint violating movement (CSCV) in BCS. Using data from two informal surveys, I will argue that in the PART-subject order, when the first conjunct (C1) moves across the PART to a higher position as in (3), only C1 can control agreement on PART. Neither C2 agreement nor masculine agreement is available.

(3) **Sablje** su se juče sudarile/*sudarili/*sudarila [***t*** i koplja]
sabers.**FPL** AUX.PL REFL yesterday collided.**FPL/*NPL/*MPL** *t* and spears.NPL
u bici.
in battle
'Sabers and spears collided in battle.'

As will be discussed in detail, this pattern is predicted by the non-linear approach but not the linear approach, thus supporting a system where agreement makes no reference to linear order.

The rest of the paper is structured as follows: Section 2 lays out the two theoretical approaches to conjunction agreement and introduces the Coordinate Structure Constraint violating movement in BCS. Section 3 discusses the crucial data combining CSCV and conjunction agreement and compares the predictions of the two approaches against the observed data. Section 4 provides more supporting evidence for the non-linear approach with two additional word orders. Section 5 concludes.

2 Analyses of conjunction agreement in BCS

The pattern of agreement options in (1)–(2) has attracted both theoretical and empirical attention, particularly the fact that agreement seems to target the linearly closest conjunct. To account for the pattern, the linear approach acknowledges the role of linear order in agreement in addition to hierarchical relations, see Marušič (2007); Bhatt & Walkow (2013); Marušič et al. (2015); Willer-Gold et al. (2016). The non-linear approach, on the other hand, argues that the linear effect is but an illusion and proposes a grammar that only makes reference to hierarchical relations such as c-command, see van Koppen (2005); Bošković (2009); Murphy & Puškar (2018) among others. In other words, the linear effect is derived from hierarchical relations within this approach. This section briefly lays out the two approaches.

2.1 Linear approach: Marušič et al. (2015); Willer-Gold et al. (2016)

Marušič et al. (2015) focused on gender agreement with conjoined subjects in Slovenian and they conducted written and spoken elicitation experiments. Their results reveal that PART can show agreement with C1, C2, or masculine agreement in the subject-PART order as shown in (4a). However, PART can only show agreement with C1 and masculine agreement but not C2 agreement in the PART-subject order (4b). Willer-Gold et al. (2016) conducted similar experiments in both BCS and Slovenian and the patterns observed are largely the same as those in Marušič et al. (2015), see (1)–(2) for examples in BCS.

(4) Slovenian

a. [Krave in teleta] so odšli/odšla/odšle na pašo.
cow.FPL and calf.NPL AUX.PL went.MPL/NPL/FPL on graze
'Cows and calves went grazing.' (Marušič et al. 2015: 20)

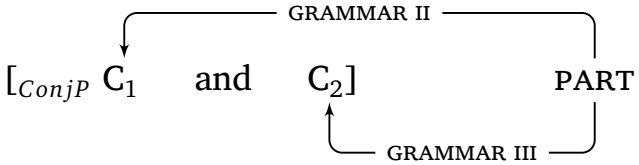
b. Včeraj so odšli/*odšla/odšle/ [krave in teleta] na pašo
yesterday AUX.PL went.MPL/*NPL/FPL cow.FPL and calf.NPL on graze
'Yesterday calves and cows went grazing.' (Marušič et al. 2015: 23)

To capture these patterns, Marušič et al. (2015) follow Bhatt & Walkow (2013) and propose an analysis where linear order can condition agreement. Although the analysis in Marušič et al. (2015) is proposed for Slovenian, Willer-Gold et al. (2016) largely adapt it for BCS.

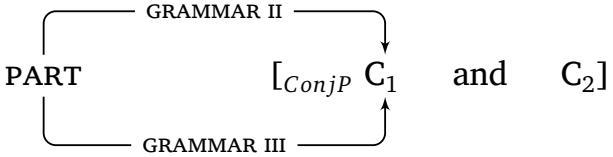
In this approach, the Agree operation proceeds in two steps: Agree-Link (establishing a dependency between the controller and the target) and Agree-Copy (copying the feature from the controller to the target). Furthermore, they assume that the ConjP has a number feature, but lacks a gender feature. In conjunction agreement, PART first Agree-Links with the ConjP, but cannot get any gender feature. In this situation, three grammars are available in Slovenian/ BCS. In Grammar I, the probing head never looks inside the ConjP ('No-Peeking' in their terms). Instead, a default masculine feature is inserted on ConjP. PART will then Agree-Copy this M feature, resulting in masculine agreement. On the other hand, in the absence of a gender feature on ConjP, the probing head in Grammars II and III looks into the ConjP ('Peeking'or 'No-Default') and searches for a gender feature on one of the conjuncts. In this case, two locality considerations are relevant in choosing which conjunct to agree with. In Grammar II, Agree-Copy takes place in PF *before* linearization, PART thus copies the gender feature of the hierarchically higher conjunct, i.e. the first/highest conjunct. In Grammar III, Agree-Copy takes place in PF *after* linearization. As a result, PART would copy the gender feature from the conjunct that is linearly closest to it, i.e. the first conjunct in the PART-subject order and the last conjunct in subject-PART order.

This linear approach correctly predicts the patterns in BCS and Slovenian mentioned above. In sentences with the subject-PART order, Grammar I will result in the default masculine agreement, Grammar II will result in agreement with the higher conjunct, i.e. C1, while Grammar III will result in agreement with linearly closest conjunct, i.e C2. The schematic illustration of Grammar II and Grammar III is shown in (5).

(5)



In sentences with the PART-subject order, Grammar I will again result in the default masculine agreement, Grammar II results in agreement with C1 as it is the higher conjunct, Grammar III also results in C1 agreement as C1 is the linearly closest conjunct to PART in this word order as is shown in (6). Note that there is no way for C2 to control agreement on PART in this order as it is neither the highest nor the closest conjunct.

(6) 

2.2 Non-linear approach: Murphy & Puškar (2018)

Unlike the linear approach, the analyses within the non-linear approach argue that the linear effect in conjunction agreement results from purely hierarchical relations. In other words, linear order plays no role in deriving the agreement patterns. These analyses include van Koppen (2005) for Dutch dialects and Bošković (2009); Murphy & Puškar (2018) for BCS. In this paper, I focus on the analysis proposed by Murphy & Puškar (2018) as their empirical claims are more in line with the experimental results from Willer-Gold et al. (2016).

Murphy & Puškar (2018) argue that the agreement patterns observed in BCS result from different orders of operations in narrow syntax including MERGE of the conjuncts, upward agree (↑AGR↑), and downward agree (↓AGR↓). The agreement process takes place in two cycles: inside the ConjP, the Conj head agrees with the conjuncts and projects its value onto the ConjP; external to the ConjP, PART agrees with the ConjP. They assume that **i.** the order of the operations within each cycle is in principle free, **ii.** that the order of ↑AGR↑ and ↓AGR↓ is constant inside and outside the ConjP in one derivation, and **iii.** that EPP movement of the agreement controller to the Spec,PartP position is only driven to feed upward agreement. The authors argue that this analysis generates all the attested patterns in BCS and rules out the unattested pattern, i.e. C2 agreement in the PART-subject order, is only compatible with a derivation in which movement to Spec,PartP takes place. Different orders and the generated agreement patterns are summarized in **Table 1**.

order	**outcome**
MERGE ≫ ↑AGR↑ ≫ ↓AGR↓	M agreement in subject-PART order
MERGE ≫ ↓AGR↓ ≫ ↑AGR↑	M agreement in PART-subject order
↑AGR↑ ≫ MERGE ≫ ↓AGR↓	C2 agreement in subject-PART order
↓AGR↓ ≫ MERGE ≫ ↑AGR↑	C1 agreement in PART-subject order
↑AGR↑ ≫ ↓AGR↓ ≫ MERGE	C1 agreement in subject-PART order
↓AGR↓ ≫ ↑AGR↑ ≫ MERGE	C1 agreement in PART-subject order

Table 1: orders and results in Murphy & Puškar (2018).

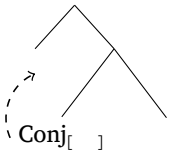
The readers are referred to Murphy & Puškar (2018) for the detailed derivations of all the possibilities. In this paper, I use C2 agreement in subject-PART order in (7) to illustrate how the

'closest conjunct agreement' (CCA) is derived in this system. In (7), the PART *prodata* 'sold' shows neuter agreement with the second conjunct *sva odela* 'all suits'.

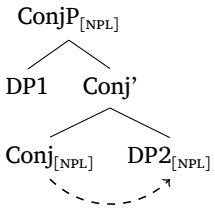
(7) [Sve haljine i **sva odela**] su juče **prodata**.
all dress.FPL and all suit.NPL are yesterday sell.NPL
'All dresses and all suits were sold yesterday.' (BCS; Murphy & Puškar 2018)

According to Murphy & Puškar (2018), the agreement pattern in (7) is generated with the order ↑AGR↑ ≫ MERGE ≫ ↓AGR↓. First, as shown in (8), the Conj head agrees upward (dashed line) and does not find a DP, since MERGE of the conjuncts has not occurred yet. After that, both conjuncts MERGE with the Conj head. The Conj head then agrees down to get the feature from the second/ lower conjunct, shown in (9). The resulting ConjP projects the feature of the second conjunct i.e. NPL. External to the ConjP, since the order of ↑AGR↑ and ↓AGR↓ is constant inside and outside the ConjP in one derivation, the PART head agrees upward first and requires the movement of the ConjP to the Spec,PartP position (solid line), as shown in (10). After the movement, PART gets the NPL feature from the ConjP. The result sentence (7) is one where PART shows agreement with the second conjunct while the ConjP is in the preverbal position. On the surface, it is a CCA pattern; however, linear order plays no role in deriving the pattern.

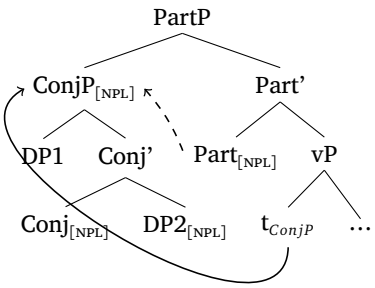
(8) ↑AGR↑ (ConjP internal)



(9) MERGE + ↓AGR↓ (ConjP internal)



(10) ↑AGR↑ (ConjP external)



As shown, both the linear and the non-linear approach can account for the agreement options available in BCS (and Slovenian). The advantage of one approach over the other is argued for based on conceptual reasons. In what follows, I will provide an empirical argument that teases the approaches apart.

2.3 Coordinate Structure Constraint violating movement in BCS

Having established the basic patterns of conjunction agreement and the two approaches under discussion, this section introduces an important piece of the argument: Coordinate Structure Constraint violating movement in BCS. Ross (1967) observes that moving one conjunct out of the conjunction is banned and proposes the Coordinate Structure Constraint (CSC) formulated in (11).

(11) In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

CSC contains two components: the Conjunct Constraint, a ban on movement *of* the conjuncts, and the Element Constraint, a ban on movement *out of* the conjuncts, following terminology from Grosu 1973; Pollard & Sag 1994. Since Grosu 1973, the two components have been argued to be independent from each other (see Oda 2021 for a recent review). In this paper, we will focus on the Conjunct Constraint and leave the Element Constraint aside. Thus I will use the label *Coordinate Structure Constraint violating movement* (hereinafter CSCV) to refer specifically to movement of the first conjunct out of the conjunction.

While the ban on movement of conjuncts is observed in many languages, there are cases of CSCV in selected languages. The sentence in (12) shows such a case in BCS: the first conjunct is moved to the sentence initial position, out of the conjunction. See Bošković 2009; Stjepanović 2014; 2017; Oda 2017; Arano & Oda 2019; Arsenijević et al. 2020a; Gračanin-Yuksek & Arsenijević 2017; Oda 2021 for discussion of CSCV movement and similar constructions.

(12) ?Knjige$_i$ je Marko [t$_i$ i filmove] kupio.
books is Marko [and movies] bought
'Marko bought books and movies.' (Bošković 2009: (30))

CSCV like (12) has been reported but the judgments are subject to speaker variation.

2.4 Predictions on conjunction agreement with CSCV

The non-linear and linear approaches to conjunction agreement make different predictions for sentences with CSCV.[4] As a reminder, sentences in the PART-subject order are repeated below:

[4] The connection between CSCV and conjunction agreement in BCS has been made in previous literature. Bošković (2009: p472), for example, links the possibility of moving the first conjunct out of the conjunction to the availability

first conjunct agreement (C1) and default masculine agreement are both allowed and second conjunct agreement (C2) is not.

(13) Juče su se sudarile/sudarili/*sudarila sablje i koplja u bici.
yesterday AUX.PL REFL collided.**FPL/MPL/*NPL** sabers.FPL and spears.NPL in battle
'Sabers and spears collided in battle.' (examples modified from Arsenijević et al. 2020b)

The first conjunct moves to the sentence initial position through scrambling/topicalization in sentences in (14).

(14) Sablje su se juče sudarile/sudarili/sudarila [***t*** i koplja] u bici.
sabers.FPL AUX.PL REFL yesterday collided.**FPL/MPL/NPL** *t* and spears.NPL in battle
'Sabers and spears collided in battle.' (examples modified from Arsenijević et al. 2020b)

Let's now look at the predictions the three grammars of the linear approach make. Grammar I does not peek inside the ConjP but inserts a default M feature in the ConjP in narrow syntax. In this grammar, the inserted default M feature controls agreement in sentences with CSCV just like the sentences without CSCV, as the ConjP is assumed to not compute a gender feature. Thus, Grammar I predicts masculine agreement in (14).

In Grammars II and III of the linear approach, no default feature is inserted, the probing head PART looks inside the ConjP. In Grammar II, Agree-Copy is postponed to PF and occurs *before* linearization. In sentences without CSCV, this results in PART agreement with the highest/first conjunct. In sentences with CSCV, if we follow the standard assumption that the lower copy or trace of the first conjunct is not present in PF, the second conjunct would be the only conjunct in the conjunction and thus the highest conjunct. In this case, C2 agreement is predicted.

The reviewers suggest another possibility: in Grammar II with the 'Peeking' preference, PART Agree-Links with both conjuncts prior to the movement of C1, and this dependency between PART and the conjuncts persists even when C1 moves away. Since the moved C1 is hierarchically higher than C2, in Grammar II, PART could choose C1 to copy the features from. This interpretation of Grammar II would additionally predict C1 agreement. It is worth noting that this interpretation differs from the original proposal by Marušič et al. (2015) that the current paper is engaging with (see Section 4.2 in Marušič et al. 2015 for the specific implementation of Grammar II and

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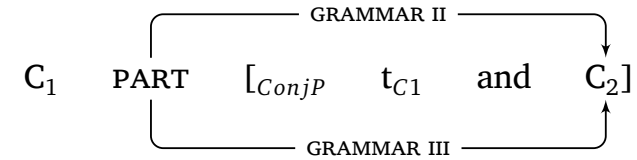
of agreement with the second conjunct. However, *the agreement patterns in sentences with CSCV* have not been systematically explored, which is what the current paper contributes (see also Footnote 11).

III). In particular, the Agree-Link would have to be between PART and each conjunct, rather than the ConjP.[5]

However, as will be discussed, the non-linear approach also predicts CSCV sentences to show C1 agreement. What is important is that the linear approach predicts multiple possibilities including C1, C2, and M agreement, while the non-linear approach predicts C1 agreement only. Thus, including the prediction of C1 agreement in Grammar II does not change the argument that will be developed.

In Grammar III, Agree-Copy is postponed to PF and occurs *after* linearization. In this case, the PART looks inside ConjP and agrees with the conjunct that is linearly closest to PART. Since in (14), the first conjunct is moved away in narrow syntax, the second conjunct would become the linearly closest conjunct in the conjunction. It is thus predicted that the second conjunct can control agreement in (14), i.e. C2 agreement. The predictions from Grammars II and III are shown in (15).

(15)



In sum, the linear approach predicts sentences with CSCV to show second conjunct agreement and masculine agreement. First/highest conjunct agreement is also predicted under a certain interpretation of Grammar II discussed above.

Now we turn to the non-linear approach. Since Move and Agree are connected in the non-linear approach, it is necessary to accommodate CSCV in the system. Following Murphy & Puškar (2018)'s assumption that movement of the subject that results in subject-PART order is required by Upward Agree (↑AGR↑), I assume that when PART probes upward and does not find a goal, either the entire conjunction or the first conjunct moves to Spec,PartP in BCS to feed ↑AGR↑. Moving the entire conjunction results in the subject-PART order, and moving the first conjunct results in a sentence with CSCV.

It then follows that sentences with CSCV can only be generated in derivations where ↑AGR↑ is ordered before ↓AGR↓. In derivations where ↓AGR↓ occurs first, CSCV (or movement of the entire conjunction) would not be required and thus does not occur. This restricts the relevant orders to the three in (16).

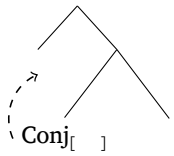
[5] One reviewer points out that this possibility is more in line with the mechanism proposed by Bhatt & Walkow (2013) for Hindi.

(16) a. ↑AGR↑ ≫ MERGE ≫ ↓AGR↓
b. MERGE ≫ ↑AGR↑ ≫ ↓AGR↓
c. ↑AGR↑ ≫ ↓AGR↓ ≫ MERGE

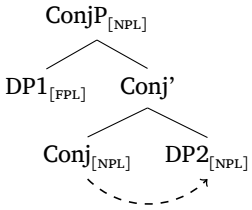
Since movement is required by ↑AGR↑ and it is the moved element that controls agreement, all three orders in (16) predict that the CSCVed first conjunct would control agreement. Masculine agreement or second conjunct agreement cannot be generated.

Take the order in (16a) for example, within the ConjP, the Conj first probes up and does not find a controller because the conjuncts have not been merged yet, as shown in (17). The conjuncts then merge with the Conj head, and the Conj head probes down and gets the feature from the second conjunct. The ConjP will end up with the feature of the second conjunct as is shown in (18). Outside the ConjP in (19), PART probes up (dashed line) and requires movement of the first conjunct (solid line). The moved first conjunct thus controls the agreement on PART.

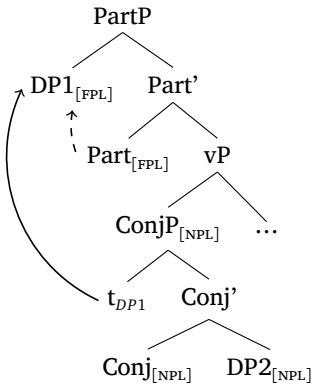
(17) ↑AGR↑ (ConjP internal)



(18) MERGE + ↓AGR↓ (ConjP internal)



(19) ↑AGR↑ (ConjP external)



The result for the other two orders is similar. In the order in (16b), within the ConjP, both the conjuncts merge with the Conj head and the Conj head gets the features from both conjuncts. Outside the ConjP, PART probes upward first, like the previous derivation, and the CSCVed first conjunct controls the agreement on PART. In the order in (16c), within the ConjP, the Conj probes up and down first but does not find a controller. The conjuncts then merge with the Conj. No features end up on the Conj head or the ConjP. Outside the ConjP, like the previous two derivations, PART probes up and the first conjunct moves up to feed it, which ends up controlling the agreement on PART.

As shown, all three orders of the non-linear approach predict the moved first conjunct to control agreement on PART. In other words, for CSCV sentences, the non-linear approach predicts only first conjunct agreement to be available, and masculine agreement or second conjunct agreement to be unavailable.[6] With the predictions worked out, we are ready to see the empirical patterns of agreement in sentences with CSCV.

3 Agreement in CSCV

3.1 Methodology

Given that the acceptability of CSCV in BCS and the preference among conjunction agreement options have both been reported to be subject to speaker variation, in the following sections, I present data obtained from two informal online surveys conducted with native speakers of BCS.

Both surveys were conducted online using Google Forms and the participants were from the Facebook group *Kako biste VI rekli?* ('How would you say?'), an online community of BCS speakers. Participation in the surveys was voluntary with no compensation. To keep the surveys short to attract more participants, each pattern was tested with one sentence. The sentences share roughly the same lexical set: sabers and spears have collided in battle. Unless specified otherwise, the participants were asked to rate the sentences on a five point scale, 1 being very unnatural and 5 being very natural. The full list of sentences (14 for Survey 1 and 12 for Survey 2) as well as the judgments by each participant (30 participants for Survey 1 and 18 participants for Survey 2) can be found in the supplementary file.

[6] A reviewer points out that Murphy & Puškar (2018) proposes a Conj head pre-specified by a M feature in BCS to account for cases of M agreement with conjuncts specified as F and N. Murphy & Puškar (2018) claims that 'speakers always have the option of choosing the & head with a pre-specified masculine gender value' (p.1235).

It is important to note that even if the Conj head is pre-specified with an M feature, the non-linear approach does not additionally predict M agreement in sentences with CSCV. As laid out above, in sentences with CSCV, the PART agrees upward and C1 moves to Spec,PartP to feed agreement. It is the moved C1 that controls agreement, not the ConjP, thus the specification on Conj should not matter. The derivation in (17)–(19) shows a case where ConjP is of neuter gender while the PART is predicted to show F agreement with the moved C1.

Note that the surveys discussed here are not intended to be considered as formal experiments. As a common practice in theoretical syntax, the methodology used here is an informal acceptability judgment task, which has been shown to be able to obtain robust data. As will be shown, the data from the surveys match existing claims in the literature that are supported by experimental results.

As will be discussed in more details below, each construction was presented with all three agreement options (agreement with C1, agreement with C2, and masculine agreement). Presenting these minimally different sentences side by side directly probes the preference among the agreement options within each construction. It is the preference among the agreement options within one construction that I will focus on since this is where the approaches make distinct predictions.

3.2 Status of CSCV

First we look at the status of CSCV in BCS. The sentence in (20) is a base sentence with post-verbal coordinated subjects and no CSCV. On the other hand, sentences in (21) and (22) involve the first conjunct moving out of the conjunction to the sentence initial position, (21) being scrambling and (22) being wh-movement.[7] These sentences were included in Survey 1. Based on the responses from 30 participants, the mean rating for the base sentence is 4.6 out of 5, which indicates that the sentence is acceptable. On the other hand, (21) gets a mean rating of 2.6, below the midpoint of the scale, and (22) a mean rating of 1.37, close to the lower end of the scale.

(20) Danas se sudaraju sablje i koplja u bici.
today REFL collide.3PL.PRES sabers.FPL and spears.NPL in battle
'Sabers and spears are colliding in battle today.' (baseline w/o CSCV)
mean of 30 = 4.6

(21) Sablje$_1$ se danas t_1 i koplja sudaraju u bici.
sabers.FPL$_1$ REFL today and spears.NPL collide.3PL.PRES in battle
'Sabers and spears are colliding in battle today.' (CSCV scrambling)
mean of 30 = 2.6

(22) Šta$_1$ se danas t_1 i koplja sudaraju u bici?
what$_1$ REFL today and spears.NPL collide.3PL.PRES in battle?
'What and spears are colliding today in battle?' (CSCV wh-movement)
mean of 30 = 1.37

The rating in the middle of the scale could result from a uniform mid-point rating by most of the speakers, or a divide among the speakers, some accepting the sentence while others rejecting

[7] Note that the sentences in (20)–(22) involve participles in the present tense which do not show gender agreement.

it. Thus we look at the distribution of the judgments among the speakers. **Table 2** shows the distribution of individual ratings as well as the mean and median ratings. The numbers in the columns labeled 1–5 indicate the number of speakers who chose that point of the scale for the corresponding sentence.

ratings	**1**	**2**	**3**	**4**	**5**	**mean**	**median**
baseline, no CSCV (20)	0	2	1	4	23	4.6	5
CSCV scrambling (21)	10	6	5	4	5	2.6	2
CSCV wh (22)	24	3	2	0	1	1.4	1

Table 2: Distribution, median, and mean for (20)–(22), n = 30.

As is shown, (20) and (22) show uniform distributions. 27 speakers rated (20) as 4 or 5, and 2 rated it as 1 or 2, meanwhile 27 speakers rated (22) as 1 or 2 and only 1 rated it as 4 or 5. We can thus conclude that (20) is generally accepted and (22) is not accepted. In contrast, the ratings for (21) show more speaker variation: 16 out of 30 speakers rated it as 1 or 2, and 9 speakers gave it a rating of 4 or 5. In other words, the relatively low mean rating of (21) does not result from a degraded status of CSCV in general (like for (22)), but rather from speaker variation. From the mean and the distribution, I conclude that CSCV is accepted by some speakers when it is scrambling, but it is generally unacceptable when it involves wh-movement. This finding is compatible with the fact that the existing CSCV examples in the literature involve scrambling and not wh-movement. Although this asymmetry between wh-movement and scrambling is an interesting fact worth investigating, we will focus on CSCV-scrambling in this paper.

Another property of CSCV that will be crucial for the argument is that CSCV feeds variable binding, which puts CSCV in the narrow syntax, rather than PF.[8] Following the standard assumption, structures in narrow syntax are spelled out to PF and LF. Movement that occurs in narrow syntax is thus able to affect interpretation in LF. On the other hand, movement in PF cannot affect the interpretation. If CSCV has interpretive effects, e.g. making a reading available, it cannot be a PF movement.

To test this, the sentences in (23) were also included in Survey 1. The sentence in (23a) is the base sentence without CSCV and in (23b), the first conjunct ‘every general’ is moved to the sentence initial position, c-commanding the subject ‘his soldiers’.

(23) a. Njegovi vojnici vole **svakog generala** i svoju zemlju.
his soldiers.NOM love **every.ACC general.ACC** and self’s country.ACC

[8] The discussion here is inspired by the discussion in Despić (forthcoming) on left branch extraction in BCS. The fact that CSCV feeds variable binding suggests that scambling involved here is A-movement. I leave the A/A’-distinction in CSCV movement aside for future research.

b. **Svakog generala**$_1$ njegovi vojnici vole t_1 i svoju zemlju.
every.ACC general.ACC his soldiers.NOM love t and self's country.ACC
Bound variable reading: 'For every general, the general's soldiers love that general and the soldiers' country.'

The relevant reading is one where 'every' binds 'his' in 'his soldiers', which can be paraphrased as 'for every general, the general's soldiers love the general and the soldier's own country.' Since in (23a), 'every general' does not c-command 'his soldiers', the bound variable reading is predicted to be unavailable. On the other hand, 'every general' is moved to a c-commanding position for 'his soldiers' via CSCV in (23b). If CSCV occurs in the PF, no interpretive difference is predicted between (23a) and (23b). If CSCV occurs in narrow syntax, (23b) is predicted to make the bound variable reading available.

To probe the pattern, the participants were asked 'Whose soldiers are they?' after each sentence in (23) and were given two options in (24). Choosing (24a) 'the generals" would indicate the bound variable reading and (24b) would indicate a non-bound variable reading where 'his' is not bound by 'every'.

(24) Čiji su vojnici? 'Whose soldiers are they?'
a. Generalovi. 'The generals'.' (bound variable reading)
b. Od nekog drugog. 'Someone else's.'

For (23a), only 5 speakers out of 30 chose (24a) and 25 speakers chose (24b), indicating that the bound variable reading is not available in (23a) as is predicted by the standard assumption. Crucially, (23b) shows the opposite pattern: 25 participants chose (24a) and 5 chose (24b), indicating that CSCV made the bound variable reading available. I thus conclude that CSCV does not occur in PF but rather is a movement in narrow syntax.[9]

3.3 Conjunction agreement in CSCV

Turning to conjunction agreement, Survey 1 also includes the sentences in (25) and (26). The sentences in (25) (repeated from (13)) are baseline sentences in PART-subject order without CSCV. PART shows first conjunct agreement (C1 agreement) in (25a), masculine agreement in (25b), and second conjunct agreement (C2 agreement) in (25c).

[9] Since not every speaker allows CSCV, I also summarize responses from the 20 participants who gave (21) a rating higher than 1: for (23a), only 2 speakers chose (24a) and 18 speakers chose (24b). Again, (23b) shows the opposite pattern: 17 participants chose (24a) and 3 chose (24b). Among the 14 participants who gave (21) a rating higher than 2, only 2 speakers chose (24a) for (23a) and 12 chose (24b), meanwhile 13 speakers chose (24a) for (23a) and 1 chose (24b). In other words, the pattern remains the same when the speakers that do not accept CSCV are excluded from the analysis.

Based on the responses from the 30 participants, first conjunct agreement has a mean rating of 4.1. Masculine agreement in (25b) has a mean of 4.27. In contrast, second conjunct agreement has a rating of 2.03, notably lower than the other two agreement options. The mean ratings replicated existing claims in the literature, as well as experimental results, indicating that for PART-subject sentences, both first conjunct agreement and masculine agreement are available while second conjunct agreement is not. The distribution, mean, and median of these sentences are shown in **Table 3**. There was no major variation among the participants.

(25) baseline PART-subject sentences with no CSCV (30 participants) (examples modified from Arsenijević et al. 2020b)

a. Juče su se sudarile sablje i koplja u bici.
yesterday AUX.PL REFL collided.**FPL** sabers.**FPL** and spears.NPL in battle
C1 agreement, mean of 30 = 4.1,

b. Juče su se sudarili sablje i koplja u bici.
yesterday AUX.PL REFL collided.**MPL** sabers.FPL and spears.NPL in battle
M agreement, mean of 30 = 4.3,

c. *Juče su se sudarila sablje i koplja u bici.
yesterday AUX.PL REFL collided.**NPL** sabers.FPL and spears.**NPL** in battle
C2 agreement, mean of 30 = 2.03
'Sabers and spears collided in battle yesterday.'

	1	**2**	**3**	**4**	**5**	**mean**	**median**
C1 agreement, no CSCV (25a)	2	1	6	4	17	4.1	5
M agreement, no CSCV (25b)	1	3	2	5	19	4.3	5
C2 agreement, no CSCV (25c)	15	6	5	1	3	2.0	1.5

Table 3: Distribution, mean and median for (25), n = 30.

The sentences in (26) are counterparts of (25) with CSCV. The first conjunct moves to the sentence initial position in all three sentences, with PART showing first conjunct agreement in (26a), masculine agreement in (26b), and second conjunct agreement in (26c).

(26) agreement in CSCV (examples modified from Arsenijević et al. 2020b)

a. **Sablje** su se juče sudarile [***t*** i koplja] u bici.
sabers.**FPL** AUX.PL REFL yesterday collided.**FPL** and spears.NPL in battle
C1 agreement: mean of 30 = 2.3

b. **Sablje** su se juče sudarili [***t*** i koplja] u bici.
sabers.FPL AUX.PL REFL yesterday collided.**MPL** and spears.NPL in battle
M agreement: mean of 30 = 1.3

c. **Sablje** su se juče sudarila [***t*** i koplja] u bici.
sabers.FPL AUX.PL REFL yesterday collided.**NPL** and spears.**NPL** in battle
C2 agreement: mean of 30 = 1.3
'Sabers and spears collided in battle yesterday.'

Based on responses from 30 participants, the mean rating for C1 agreement is 2.3 out of 5; the mean rating for masculine agreement is 1.3 and the mean for C2 agreement is also 1.3. The distribution, mean, and median for each option are shown in **Table 4**. Ratings of (21), which also involves CSCV scrambling but with no agreement, are also included for comparison.

	1	**2**	**3**	**4**	**5**	**mean**	**median**
C1 agreement, CSCV (26a)	14	6	2	4	4	2.3	2
M agreement, CSCV (26b)	24	4	0	2	0	1.3	1
C2 agreement, CSCV (26c)	23	6	0	1	0	1.3	1
CSCV scrambling (21)	10	6	5	4	5	2.6	2

Table 4: Distribution, median, and mean for (26a)–(26c), n = 30.

The mean rating of C1 agreement with CSCV (26a) is similar to that of CSCV with no agreement (21) at around 2.3–2.6. C2 agreement and masculine agreement, on the other hand, are rated lower at 1.3. C1 agreement with CSCV also shows similar distribution profile as (21): 20 speakers gave it a rating of 1 or 2, while 8 gave it 4 or 5. In contrast, 28 out of 30 speakers gave masuline agreement a rating of 1–2 and only 2 rated it as 4–5; 29 speakers gave C2 agreement a rating of 1–2 and only one rated it as 4–5. It is clear that the speakers uniformly rejected C2 agreement and masculine agreement in sentences with CSCV, while C1 agreement in CSCV is rated on par with CSCV with no agreement.

Although there is a difference between C1 agreement and the other two agreement options in CSCV, none of the agreement options are rated above the midpoint of the scale. I propose two reasons for the low rating: 1. as is discussed above, CSCV in BCS shows speaker variation independently from agreement patterns, the mean ratings also include the low ratings of speakers who do not allow CSCV in general; 2. even for the speakers who do allow CSCV, sentences with CSCV are not rated as high as other more 'vanilla' constructions in (20) and (25), likely due to the low frequency or the processing difficulty of CSCV constructions.[10] It is thus important to keep

[10] Compared to the sentences with no CSCV, sentences with CSCV involve a filler-gap dependency between the overtly moved conjunct and the gap where the conjunct is interpreted. Filler-gap dependencies have been shown to involve higher processing load (Kluender 1991; Kluender & Kutas 1993; Hofmeister & Sag 2010).

in mind that it is the contrast between the agreement options *within* each construction that the approaches to agreement make different predictions about.

The distinction between C1 agreement in CSCV and the other two agreement options is more obvious if responses from the 16 speakers who gave CSCV scrambling (21) a rating of 1–2 are set aside. These speakers are likely to not allow CSCV in BCS in general. Distribution, mean ratings, and medians of the sentences discussed so far from the remaining 14 speakers are summarized in **Table 5**. Note that the acceptability patterns for sentences with no CSCV remain the same: C1 agreement and masculine agreement in (25a) and (25b) are rated at 4.2 and C2 agreement in (25c) is rated as 2. In sentences with CSCV, the wh-question in (22) remains unacceptable, so are masculine agreement (26b) and C2 agreement (26c). C1 agreement, on the other hand, has a mean of 3.2, notably higher than the other agreement options.

	1	**2**	**3**	**4**	**5**	**mean**	**median**
baseline, no CSCV (20)	0	1	0	2	11	4.6	5
CSCV scrambling (21)	0	0	5	4	5	4.0	4
CSCV wh (22)	11	1	1	0	1	1.5	1
C1 agreement, no CSCV (25a)	1	0	3	1	9	4.2	5
M agreement, no CSCV (25b)	1	0	2	3	8	4.2	5
C2 agreement, no CSCV (25c)	7	4	1	0	2	2.0	1.5
C1 agreement, CSCV (26a)	3	3	0	4	4	3.2	4
M agreement, CSCV (26b)	10	2	0	2	0	1.6	1
C2 agreement, CSCV (26c)	10	3	0	1	0	1.4	1

Table 5: Distribution, mean, and median in Survey 1. n = 14, excluding participants who gave CSCV scrambling a rating of 1 or 2.

Factoring the speaker variation and the lower rating of CSCV sentences in general, the data above show that first conjunct agreement is the only acceptable option in sentences with CSCV. Masculine agreement and C2 agreement are not available. These results are compatible with the predictions made by the non-linear approach as laid out in the previous section. The predictions made by the linear approach were not supported: neither masculine agreement nor C2 agreement is available. The agreement patterns in sentences with CSCV thus argue for the non-linear approach and against the linear approach.

3.4 Evaluating the ellipsis analysis

This section addresses an alternative ellipsis analysis of the CSCV data from the last section. So far I have been assuming the sentences in (26) to be base-generated with a conjunction subject

where the two NPs are coordinated. It is the CSCV movement that derives the word order in the sentence as is shown in (27).

(27) Sablje$_1$ …[t_1 i koplja]
sabers$_1$ …[t_1 and spears]

The alternative analysis is one where (26) is derived from a conjunction of two clauses with most elements in the second clause elided. As is shown in (28), two clauses with the subject-PART order are coordinated. Within each conjunct, PART shows agreement with its own local subject. PART of the second conjunct is elided along with other elements. This derivation does not involve CSCV at all. Agreement with *sablje* is expected since it is the true subject of the clause where the PART is. Masculine agreement or agreement with *koplja* would not be generated. Thus if (28) is the right analysis of (26), the agreement pattern would not tease the two approaches to conjunction agreement apart (since there is no conjunction agreement to begin with).

(28) [Sablje su se juče sudarile] i [koplja ~~su~~ ~~se~~
sabers.**FPL** AUX.PL REFL yesterday collided.**FPL** and spears.**NPL** AUX.PL REFL
~~juče~~ ~~sudarila~~ u bici]
yesterday collided.**NPL** in battle

Using three tests, I will argue that the bi-clausal ellipsis structure cannot be the only source of sentences with CSCV discussed above. The tests are drawn from Arsenijević et al. (2020b) in which the authors argue against a sole ellipsis analysis for sentences with closest conjunct agreement (without CSCV) in BCS.

If the bi-clausal ellipsis analysis is the only way to generate the sentences with CSCV, the sentence with ellipsis should have the same interpretation as the non-elliptical form with two full clauses. On the other hand, the structure with coordinated subjects predicts that sentences with CSCV can have different interpretations from the coordinated clauses. We will focus on three interpretations that can tease these structures apart: the collective reading, the cumulative reading, and the internal reading of *different*.

The sentence in (29a) has two interpretations: the distributive reading where sabers collided with sabers and spears collided with spears, and the collective reading where sabers collided with spears. On the other hand, the sentence with two coordinated clauses in (29b) only allows the distributive reading and not the collective reading. If the ellipsis structure is the only source, the sentence in (26a) is predicted not to allow the collective reading, just like the two coordinated clauses. On the other hand, the coordinated subject + CSCV analysis predicts the collective reading to be available.

(29) a. Sabers and spears collided.
b. Sabers collided and spears collided.

The same logic goes with the cumulative reading. The sentence in (30a) can mean that sabers and spears were put in three boxes altogether, while (30b) is the most natural in a scenario where sabers were put in three boxes and spears were put three different boxes. The ellipsis analysis thus predicts the CSCV constructions with C1 agreement to be judged false in a scenario where a mixture of sabers and spears are put in three boxes. The coordinated subject + CSCV analysis would predict the construction to be true.

(30) a. Sabers and spears were put in three boxes.
b. Sabers were put in three boxes and spears were put in three boxes.

Lastly, (31a) is compatible with the scenario where sabers are put in one box and spears were put in a different box. This reading is labeled as the internal reading. The sentence in (31b) does not allow the internal reading but is judged true in a scenario where the sabers are put in multiple boxes and spears are put in multiple boxes. The ellipsis analysis then predicts the relevant sentence in (26a) to disallow the internal reading.

(31) a. Sabers and spears were put in different boxes.
b. Sabers were put in different boxes and spears were put in different boxes.

To probe these interpretations, Survey 1 also included the following three sentences in (32) along with the pictures in **Figures 1, 2**, and **3** respectively. The sentence in (32a) with **Figure 1** is for the collective reading; (32b) with **Figure 2** for the cumulative reading; and (32c) with **Figure 3** for the internal reading of *different*. The participants were asked to judge whether the sentences are true given the scenarios depicted in the pictures by choosing from *Da* 'Yes' and *Ne* 'No'. All the sentences are with CSCV and C1 agreement. As discussed above, the bi-clausal ellipsis analysis is not compatible with the readings, thus the sentences are predicted to be rejected. On the other hand, the coordinated subject + CSCV analysis predicts the sentences to be judged true.

(32) a. **Sablje**$_1$ su se juče sudarile t_1 i koplja u bici.
Sabers.**FPL** AUX REFL yesterday collided.**FPL** t_1 and spears.NPL in battle
'Sabers and spears collided in battle yesterday.'
Collective reading: *Da.*: 19, *Ne.*: 11

b. **Sablje**$_1$ su danas stavljene t_1 i koplja u 3 kutije ...
Sabers.**FPL** AUX today put.PASSIVE.**FPL** t_1 and spears.NPL in three boxes
'Sabers and spears were put in three boxes today ...'
Cumulative reading: *Da.*: 20, *Ne.*: 10

c. **Sablje**$_1$ su danas stavljene t_1 i koplja u različite kutije.
Sabers.**FPL** AUX today put.PASSIVE.**FPL** t_1 and spears in different boxes
'Sabers and spears were put in different boxes.'
Internal reading: *Da.*: 19, *Ne.*: 11

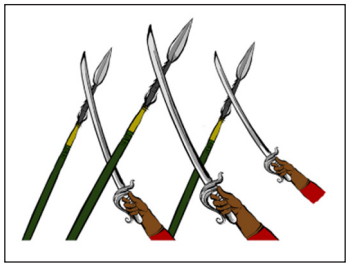


Figure 1: collective (Figure 2 in Arsenijević et al. 2020b).

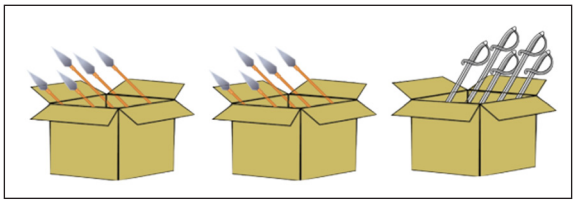


Figure 2: cumulative.

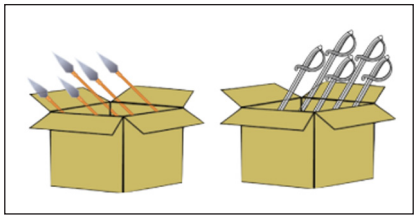


Figure 3: internal.

Out of the 30 participants, 19 chose ‘Da.’ and 11 chose ‘Ne.’ for (32a); 20 chose ‘Da’ and 10 chose ‘Ne’ for (32b); and 19 chose ‘Da’ and 11 chose ‘Ne.’ for (32c). For each reading, the number of speakers who accept the reading is twice as many as the ones that rejected it. This indicates that 19–20 speakers accepted the readings that are predicted to be bad if the bi-clausal ellipsis structure is the only source for sentences with CSCV.

One may wonder about the 10–11 speakers who rejected the readings. Note that the sentences in (32) involve CSCV with C1 agreement. The responses from all 30 speakers include ones that are from speakers who do not allow CSCV in the first place. In order to more specifically probe how speakers who allow CSCV interpret the sentences, we can look at responses only from speakers who rated the sentence with CSCV scrambling in (21) as 3 and above. As mentioned in the last section, 16 participants rated (21) as 1 or 2. Among the remaining 14, 13 speakers chose ‘Da.’ for (32a) and (32b) and 12 chose ‘Da.’ for (32c). In other words, when looking at responses only from speakers who allow CSCV, the readings in (32) predicted by the coordinated

subject + CSCV analysis are uniformly accepted. I take this as evidence that the bi-clausal ellipsis analysis cannot be the only source for the sentences with CSCV, thus the argument for the non-linear approach made in the last section stands.

4 More supporting evidence

Having laid out the main argument, this section reports further data supporting the predictions made by the non-linear approach to conjunction agreement. Data to be reported in this section were obtained through Survey 2, which was posted in the same Facebook group as Survey 1. As with Survey 1, the participants were asked to rate the sentences on a five point scale. Each construction was tested with one sentence to keep the survey short. 18 speakers finished Survey 2.

4.1 Order: Aux C1 Part and C2

The patterns observed in the previous section established a generalization: when C1 moves out of the conjunction, it must control agreement. We have shown that this generalization is predicted by the non-linear approach and not the linear approach. The sentences we have looked at are of the shape in (33), i.e. the first conjunct moves to the sentence initial position before the auxiliary while the rest of the conjunction stays after the PART. This section looks at the order in (34) where the first conjunct moves to the position between Auxiliary and PART.

(33) AUX PART C1 and C2 → C1 AUX PART t and C2

(34) AUX PART C1 and C2 → AUX C1 PART t and C2

Before discussing the agreement patterns of (34), we discuss the derivation of the word order in (34). Following the standard assumption, the subject ConjP is base-generated in a post-verbal position as in (35a). When the entire ConjP moves to Spec,PartP, the order in (35b) is derived with the subject between AUX and PART. Sentences with sentence-initial subjects (e.g. (1)) result from moving the subject from Spec,PartP to the sentence initial position (e.g. Spec,TP) as in (35c).

(35) a. _____ AUX _____ PART ConjP (post-PART subject)
b. _____ AUX ConjP PART t_{ConjP} (post-AUX pre-PART)
c. ConjP AUX t_{ConjP} PART t_{ConjP} (sentence initial)

Having covered the orders without CSCV, we move on to the order with CSCV in (33) and (34). Starting again from the post-verbal subject in (36a), the first conjunct can undergo CSCV to Spec,PartP in BCS, resulting in the first conjunct between Aux and Part and the rest of the ConjP at the post-verbal position as in (36b). This is how (34) is derived. Then the first conjunct can further move to the sentence initial position resulting in (36c), the order in (33) (which is a schematic representation of the crucial data (26) in the last section).

(36) a. __ AUX __ PART C1 and C2 (post-PART subject)
b. __ AUX C1 PART t_{C1} and C2 (post-AUX pre-PART)
c. C1 AUX t_{C1} PART t_{C1} and C2 (sentence initial)

Sentences in the order in (34) were tested using sentences in (37) in Survey 2. The predictions made by the two approaches should be the same as those for (33): the linear approach predicts first conjunct agreement (37a), masculine agreement (37b), and second conjunct agreement (37c) while the non-linear approach predicts first conjunct agreement (37a) only.

Based on responses from 18 participants, first conjunct agreement has a mean rating of 2.8 out of 5; masculine agreement has a mean of 1.2 and C2 agreement has a mean of 1.4. The pattern of agreement options in this order is the same as the order in (36c) reported in (3): first conjunct agreement is preferred over the other two options.

(37) a. Juče su se sablje sudarile *t* i koplja u bici.
yesterday AUX REFL sabers.**FPL** collided.**FPL** *t* and spears.NPL in battle
C1 agreement: mean = 2.8

b. Juče su se sablje sudarili *t* i koplja u bici.
yesterday AUX REFL sabers.FPL collided.**MPL** *t* and spears.npl in battle
Masculine agreement: mean = 1.2

c. Juče su se sablje sudarila *t* i koplja u bici.
yesterday AUX REFL sabers.FPL collided.**NPL** *t* and spears.**NPL** in battle
C2 agreement: mean = 1.4
'Sabers and spears were collided in battle yesterday.'

Distribution of the ratings of (37) as well as the mean and median are reported in **Table 6**. 8 speakers rated C1 agreement as 1 or 2 while 7 rated it as 4 or 5, an even divide which indicates speaker variation. In contrast, all 18 speakers gave (37b) a rating of 1 or 2 and 17 out of the 18 speakers gave (37c) a rating of 1 or 2. Masculine agreement and C2 agreement in this order are uniformly rejected.

Aux C1 Part and C2	**1**	**2**	**3**	**4**	**5**	**mean**	**median**
C1 agreement (37a)	4	4	3	6	1	2.8	3
M agreement (37b)	14	4	0	0	0	1.2	1
C2 agreement (37c)	14	3	0	0	1	1.4	1

Table 6: Distribution, mean and median of (37), n = 18.

This observed pattern is parallel to the previous data with CSCV in (26): first conjunct agreement is accepted while second conjunct agreement and masculine agreement are not. The identical pattern observed in (37) and in (26) is expected in the non-linear approach.

4.2 C1 does not always control agreement: C1 Aux and C2 Part

In the patterns we have seen so far, the CSCVed C1 always controls agreement on PART. This section will show that this is not always the case. Rather, C1 controls agreement when the non-linear approach predicts it to do so, and the pattern changes when the approach predicts otherwise.

The non-linear approach has been successful in accounting for the CSCV data because it connects movement to Spec,PartP and agreement on PART. In all the CSCV sentences we have discussed so far, C1 is moved to Spec,PartP, thus it is predicted to control the agreement. On the other hand, if the CSCV does not involve the movement of C1 to Spec,PartP, the non-linear approach would not straight-forwardly predict that agreement on PART is controlled by only C1. The order in (38) is such a case. Following the standard assumption, I assume that the order in (38) is derived from the structure in (35b) repeated here as (39a), where the ConjP moves to Spec,PartP. In (38), instead of moving the entire ConjP further to the sentence initial position (as in (35c)), the first conjunct moves out of the ConjP to the sentence initial position as in (39b).

(38) C1 AUX t_{C1} and C2 PART

(39) a. __ AUX $[_{ConjP}$ C1 and C2] PART t_{ConjP}

b. C1 AUX $[_{ConjP}$ t_{C1} and C2] PART t_{ConjP}

Since the entire ConjP is in Spec,PartP position, the non-linear approach predicts sentences with the order in (38) to show the same agreement patterns as any sentences with pre-verbal subjects: first conjunct agreement, masculine agreement, and second conjunct agreement. The derivation has been worked out in detail by Murphy & Puškar (2018) (section 4.4). In particular, the following three orders would generate the three agreement patterns in sentences with pre-verbal subjects. Crucially, the further movement of C1 from Spec,PartP to the sentence initial position is predicted not to affect the agreement patterns on PART.

(40) a. ↑AGR↑ ≫ ↓AGR↓ ≫ MERGE → first conjunct agreement
b. MERGE ≫ ↑AGR↑ ≫ ↓AGR↓ → masculine agreement
c. ↑AGR↑ ≫ MERGE ≫ ↓AGR↓ → second conjunct agreement

The order in (38) was tested using the sentences in (41): first conjunct agreement (41a), masculine agreement (41b), and second conjunct agreement (41c). These sentences were included in Survey 2 with 18 participants.[11] Based on the responses, first conjunct agreement in (41a) has a mean

[11] Note that the test sentences for this word order are constructed in such a way that C1 is separated from the rest of the ConjP 'and C2' by multiple elements including AUX REFL and 'yesterday'. This is to prevent an alternative construction where the second position clitic AUX is inserted between C1 and 'and C2' which does not necessarily require movement of C1 out of the ConjP as is shown in (i). This construction is investigated by Gračanin-Yuksek & Arsenijević (2017); Arsenijević et al. (2020a).

(i) [Direktor će i njegov tajnik] zakasniti
manager will and his secretary come.late
'The manager and his secretary will be late.' (Gračanin-Yuksek & Arsenijević 2017: (1))

rating of 2.1. Masculine agreement (41b) has a rating of 3. Second conjunct agreement (41c) has a mean of 2.7.

(41) C1 AUX and C2 PART

a. Sablje su se juče *t* i koplja sudarile u bici.
sabers.**FPL** AUX REFL yesterday *t* and spears.NPL collided.**FPL** in battle
C1 agreement: mean = 2.1

b. Sablje su se juče *t* i koplja sudarili u bici.
sabers.FPL AUX REFL yesterday *t* and spears.NPL collided.**MPL** in battle
M agreement: mean = 3

c. Sablje su se juče *t* i koplja sudarila u bici.
sabers.FPL AUX REFL yesterday *t* and spears.**NPL** collided.**NPL** in battle
C2 agreement: mean = 2.7
'Sabers and spears were collided in battle yesterday.'

The distribution, the mean and the median of the judgments are shown in **Table 7**. **Table 7** also includes previous cases of acceptable CSCV sentences for comparison.

Focusing on masculine agreement and C2 agreement first, both options have a mean rating close to 3, the midpoint of the scale, and show speaker variation: 7 speakers out of 18 rated (41b) as 1 or 2 and 9 speakers rated it as 4 or 5; whereas 10 speakers rated (41c) as 1 or 2 and 7 rated it as 4 or 5. This pattern is similar to the CSCV sentence without agreement in (21) as well as the CSCV sentences with C1 agreement in (26a) and (37a). Thus I conclude that in the order where the conjunction precedes the PART, both masculine agreement and C2 agreement are available even with CSCV.

C1 Aux and C2 Part	**1**	**2**	**3**	**4**	**5**	**mean**	**median**
C1 agreement (41a), n = 18	8	4	4	0	2	2.1	2
M agreement (41b), n = 18	6	1	2	5	4	3.0	3.5
C2 agreement (41c), n = 18	6	4	1	3	4	2.7	2
CSCV + no agreement (21), n = 30	10	6	5	4	5	2.6	2
C1 agreement + CSCV (26a), n = 30	14	6	2	4	4	2.3	2
C1 agreement + CSCV (37a), n = 18	4	4	3	6	1	2.8	3

Table 7: Distribution, mean and median of (41).

On the other hand, C1 agreement in (41a) shows a lower mean rating of 2.1, and 12 out of 18 speakers gave it a rating of 1 or 2. I propose that this pattern results from two factors: 1) the lower rating of CSCV constructions in general discussed above, and 2) a dispreference of highest conjunct agreement in subject-PART order in BCS. Although C1 agreement in subject-PART order has been acknowledged as a legitimate agreement strategy in multiple elicitation experiments (Marušič et al. (2015); Willer-Gold et al. (2016)), it is consistently less preferred compared to

masculine agreement and C2 agreement.[12] In Exp 1 in Willer-Gold et al. (2016), the participants were asked to produce PART based on coordinated subjects of different gender combinations. When the first conjunct is feminine and the second is neuter (the same combination in Survey 1 and 2 in (41)), the highest conjunct agreement only takes 11% of all responses, compared to 36% for masculine agreement and 53% for neuter agreement.[13] This dispreference has been acknowledged and discussed in Marušič et al. 2015: fn. 4, Willer-Gold et al. 2016: Section 4.1. Taking these two factors into consideration, I conclude that C1 agreement, C2 agreement and masculine agreement are all viable agreement options in the subject-PART order with C1 moved away. The parallel between (41) with CSCV and the subject-PART order without CSCV also confirms the predictions made by the non-linear approach.

The availability of C1, C2 and masucline agreement in (41) also argues against a variation of the linear approach suggested by a reviewer. In this suggested variation, both the moved C1 and the stranded ConjP are potential goals for Agree-Link in sentences with CSCV movement. If one assumes that in this configuration, PART always Agree-Links with the higher goal, C1, and ignores the ConjP, the linear approach would also predict only C1 agreement in sentences with CSCV movement. However, this variation would also predict a C1-agreement-only pattern in (41), contrary to the fact.

Table 8 shows the mean ratings of each agreement strategy in the three orders we have discussed so far. Note that the linear approach makes identical predictions with the non-linear approach regarding the last order. The sentences in (41) are thus not on their own a supporting piece of evidence for the non-linear approach. However, what's crucial here is that the non-linear approach correctly predicts patterns observed in all three orders in **Table 8**, including the differences among them, while the linear approach makes wrong predictions for the first two orders.

	C1	C2	M	Non linear	Linear
C1 Aux Part & C2	2.3	1.3	1.3	predicted	not predicted
Aux C1 Part & C2	2.8	1.4	1.2	predicted	not predicted
C1 Aux & C2 Part	2.1	2.7	3	predicted	predicted

Table 8: agreement patterns of different orders with CSCV.

4.3 Sentences with three conjuncts

In all the sentences we have seen so far, PART cannot target the second conjunct for agreement, which I have argued to support the non-linear approach. A potential alternative explanation is that second conjunct agreement is in principle available. However, when the speakers parse these sentences, the overt conjunction head 'and' provides a strong cue to stop the search for the agreement controller. After all, in no sentences with the PART-subject word order would PART agree with anything that comes after the coordinator 'and'. Note that this alternative refers to the

[12] In fact, earlier analysis such as Bošković (2009) categorized highest conjunct agreement in this order as unacceptable.

[13] See Marušič & Shen (2021) for the same pattern in disjunction agreement.

processing/parsing of the sentences rather than the syntactic structure. If this idea is on the right track, the degraded C2 agreement reported above would not directly argue against the linear approach. This is shown schematically in (42a).

In this section, I show that this possibility is untenable using data from sentences with three conjuncts. In the construction with three conjuncts shown in (42b), there is no overt Conj head between PART and C2, thus C2 agreement would not be affected by the processing factor mentioned above. If Agree-Copy can be postponed to PF after linearization according to the linear approach, PART is predicted to be able to agree with C2.

(42) a. C1 PART [t_{C1} **and** C2]
b. C1 PART [t_{C1}, C2 **and** C3]

To test this alternative, the sentences in (43) and (44) were included in Survey 2 with 18 participants. First, sentences without CSCV with different agreement patterns in (43) were tested to establish a baseline of different agreement strategies in sentences with three conjuncts. The first conjunct is of neuter gender while the following two conjuncts are of feminine gender. First conjunct agreement has a mean rating of 4.7, masculine agreement has a mean rating of 4.3, second conjunct agreement, on the other hand, has a meaning rating of 2.7. In line with sentences with two conjuncts in (25), first conjunct agreement (43a) and masculine agreement (43b) are acceptable while C2 agreement (43c) is degraded.

(43) 18 participants, PART-subject order with three conjuncts
a. Juče su se sudarila koplja, sekire i sablje.
yesterday AUX REFL collided.**NPL** spears.**NPL**, axes.FPL, and sabers.FPL
C1 agreement: mean = 4.7
b. Juče su se sudarili koplja, sekire i sablje.
yesterday AUX REFL collided.**MPL** spears.NPL, axes.FPL, and sabers.FPL
M agreement: mean = 4.3
c. Juče su se sudarile koplja, sekire i sablje.
yesterday AUX REFL collided.**FPL** spears.NPL, axes.**FPL**, and sabers.FPL
C2 agreement: mean = 2.7
'Spears, axes, and sabers collided yesterday.'

The distribution, mean, and median for the three sentences are shown in **Table 9**. C1 agreement and masculine agreement are uniformly accepted. On the other hand, C2 agreement shows speaker variation: 9 speakers gave (43c) a rating of 1 or 2 while 8 gave it a rating of 4 or 5. This is surprising for both the linear and the non-linear approach as both predict (43c) to be unacceptable. I will leave this data point for future research and tentatively conclude that the C2 agreement is degraded in (43c).[14]

[14] A reviewer pointed out that the higher-than-expected rating of (43c) might result from syncretism between the FPL ending of the second and third conjuncts *-e* and the FPL ending on PART *sudaril-e*. The facilitating effect of this type of syncretism is investigated in Mitić & Arsenijević (2019).

three Cs, no CSCV	1	2	3	4	5	mean	median
C1 agreement (43a)	1	0	0	2	15	4.7	5
M agreement (43b)	1	2	0	2	13	4.3	5
C2 agreement (43c)	7	2	1	6	2	2.7	2.5

Table 9: Distribution, mean, and median for 3 conjuncts with no CSCV, n = 18.

In the sentences in (44), the first conjuncts moved to the pre-PART position which I will assume to be Spec,PartP. If the unavailability of C2 agreement in sentences with CSCV reported in previous sections results from the overt Conj head blocking the search for the agreement controller, it is predicted that agreeing with the second conjunct is acceptable here as there is no overt 'and' between PART and the second conjunct. As is shown, based on responses of 18 speakers, the first conjunct agreement in (44a) has a mean rating of 2.3, the resolved agreement in (44b) has a mean rating of 1.3, and the second conjunct agreement in (44c) has a mean rating of 1.4.

(44) 18 participants, CSCV with three conjuncts

a. Juče su se koplja sudarila, *t* sekire i sablje u bici.
yesterday AUX REFL spears.**NPL** collided.**NPL** *t* axes.FPL, and sabers.FPL in battle
C1 agreement: mean = 2.3

b. Juče su se koplja sudarili, *t* sekire i sablje u bici.
yesterday AUX REFL spears.NPL collided.**MPL** *t* axes.FPL, and sabers.FPL in battle
M agreement: mean = 1.3

c. Juče su se koplja sudarile, *t* sekire i sablje u bici.
yesterday AUX REFL spears.NPL collided.**FPL** *t* axes.**FPL**, and sabers.FPL in battle
C2 agreement: mean = 1.4
'Spears, axes, and sabers were collided in battle yesterday.'

The distribution, mean, and median for these sentences are shown in **Table 10**. The data here is similar to agreement with two conjuncts in sentences in (37) and **Table 6**.

three Cs, CSCV	1	2	3	4	5	mean	median
C1 agreement (44a)	6	6	3	1	2	2.3	2
M agreement (44b)	15	1	2	0	0	1.3	1
C2 agreement (44c)	15	1	1	0	1	1.4	1

Table 10: Distribution, mean, and median for 3 conjuncts with CSCV, n = 18

The results above show that, contrary to the prediction made by the alternative analysis, second conjunct agreement remains unavailable even when there is no overt Conj head between

PART and the second conjunct. Similarly, default masculine agreement remains unavailable. Agreement with the moved conjunct is still the best option out of the three.[15,16] The results rule out the hypothesis that the overt Conj head blocks the agreement.

5 Conclusion

This paper explores Coordinate Structure Constraint violating movement in BCS and argues for the non-linear approach to conjunction agreement. As is shown in multiple word orders, when C1 moves across PART, stranding the rest of the conjunction, C1 agreement with PART becomes the only acceptable agreement option. This generalization, which the linear approach has difficulties accounting for, is predicted by the non-linear approach proposed by Murphy & Puškar (2018). If the argument is on the right track, a grammar model where linear order plays a role in syntactic operations like agreement should be reconsidered.

This paper only scratches the surface of properties of CSCV movement and its interaction with other operations like Agree. Much more work is required to further our understanding of CSCV movement in general as well as in conjunction agreement specifically.

The empirical findings from the informal surveys in this paper as well as their theoretical implications can be made more robust with a series of formal experiments with multiple lexically matched sets and filler items as is done in the previous studies of conjunction agreement, which I leave to future reseach.

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[15] Note that the mean rating for (44a) (2.3) is lower than first conjunct agreement in CSCV sentences with two conjuncts (mean of (37a) = 2.8). I take this to be partly due to the increased processing difficulty in CSCV sentences with three conjuncts. What's important is that the contrast among agreement options within the same construction remains consistent.

[16] Sentences with three conjuncts where the first conjunct moves to the sentence initial position were tested in a separate survey where six participants judged the sentences in (i) on a 7 point scale (excluding the responses from one participant who rated all sentences as 1). The same pattern was observed: only the moved conjunct can control agreement, second conjunct agreement and masculine agreement are not acceptable.

(i) a. Haljine$_1$ su juče prodate t_1 odela i suknje. (3.6/7)
dresses.**FPL** AUX yesterday sold.**FPL** suits.NPL and skirts.FPL

b. *Haljine su juče prodati t_1 odela i suknje. (1/7)
dresses.FPL AUX yesterday sold.**MPL** suits.NPL and skirts.FPL

c. *Haljine su juče prodata t_1 odela i suknje. (1.2/7)
dresses.FPL AUX yesterday sold.**NPL** suits.**NPL** and skirts.FPL
'Dresses and suits and skirts were sold yesterday.'

Abbreviations

1 = first person, 2 = second person, 3 = third person, ACC = accusative, AUX = auxiliary, F = feminine, M = masculine, N = neuter, PL = plural, PART = participle, SG = singular

Supplementary file

Supplementary file: *Surveys and data*. Sentences included in two surveys and the judgment data. DOI: https://doi.org/10.16995/glossa.6382.s1

Acknowledgements

I thank the Glossa editor and two anonymous reviewers for their invaluable comments and suggestions. Thanks to Aida Talič who asked me 'What happens if you move the first conjunct?' in a talk at Urbana-Champaign which inspired the paper. Thanks to Jelena Stojković for creating the original sentences. Thanks to the admin and members of the Facebook group *Kako biste VI rekli?* ('How would you say?'), who provided the data. Thanks to Boban Arsenijević, Lanko Marušič, Andrew Nevins, and Jana Willer-Gold for allowing me to use one of their images and for their work on Slavic agreement in general. Thanks to Željko Bošković, Hiromune Oda, Sandra Stjepanović for their comments. Thanks to Beth Chan, Michael Yoshitaka Erlewine, Nick Huang for reading a previous draft. Thanks to the audience at the Workshop on Agreement in Multivaluation Constructions, LSA 2021, AJL 5, and SLS 16. All errors are mine.

Competing interests

The author is a guest-editor of the Special Collection in which this paper is published. To avoid a conflict of interest, their paper was handled by the Glossa Editorial Team.

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