Non-illusory linear effect in Closest Conjunct Agreement

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1 Two types of Closest Conjunct Agreement

Agreement with conjoined subjects often results in a value that reflects the sum of the two conjuncts. For example, in (1), the verb *are* shows plural despite both of the conjuncts being singular. In other words, the singular features on the conjuncts are resolved into a plural feature.[1]

(1) [$_{DP}$ John$_{[SG]}$ and Mary$_{[SG]}$] are$_{[PL]}$ tall.

Resolved agreement in (1) is not the only option across languages. In the Welsh example in (2), the verb *gwelais* 'saw' shows the feature value of the first conjunct rather than the plural feature of the whole conjunction phrase. Since the agreement controller *ti* 'you.SG' is linearly the closest conjunct to the agreement target *gwelais*, this pattern is labeled as Closest Conjunct Agreement (hereinforth CCA). The agreeing controller and target are in bold throughout the paper.

(2) **Gwelais** [**ti** a Megan] ein hunain.
see.PST.2SG you.SG and Megan 2PL SELF
'You and Megan saw yourselves.' (Welsh; Borsley 2009)

CCA patterns appear in various constructions and in agreement of different features. The sentence in (3) is an example from object agreement in Hindi. The verb agrees with the closest, in this case, the second, conjunct in gender rather than a resolved gender of the entire conjunction phrase. In (4), the Bavarian complementizer *dass* can either show 2PL agreement with the whole conjunction phrase or 2SG agreement with the first conjunct. See Nevins and Weisser (2019) for a recent overview of CCA patterns observed across languages.

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(3) maiMN-ne [ek chaataa aur **ek saaRii**]
I-ERG an umbrella.ABS.M.SG and a saree.ABS.F.SG
khariid-ii
buy-PERF.F.SG
'I bought an umbrella and a saree.' (Hindi; Benmamoun et al. 2009)

(4) ... dass-ds/**-sd** **du** und d'Maria an Hauptpreis
... that-2.PL/2.SG [you.2.SG and the Maria]$_{[2.PL]}$ the first.prize
gwunna hab-ds.
won have-2.PL
'...that Maria and you have won the first prize.'
(Bavarian; van Koppen 2005: 25)

CCA patterns illustrated in (2)-(4) share the following properties: **i.** the agreeing DPs form a conjunction phrase (ConjP) mediated by a conjunct head (Conj); **ii.** the agreement target (verb/T) is external to the ConjP; **iii.** the competing agreement controllers are the ConjP and one of the conjoined DPs. This is shown explicitly in (4), where either the ConjP (2PL) or the first conjunct (2SG) controls the agreement on the complementizer. I will label CCA with these properties as *Type 1 CCA*. As we will see, the properties listed above are substantial in the accounts for Type 1 CCA in the literature. Most of the accounts that will be discussed in this paper assume that Type 1 CCA is triggered when the ConjP lacks certain features, thus allowing the agreement target to probe one conjunct inside the ConjP.

Studies on Type 1 CCA have been fruitful, partly because it is one of the rare cases where linear order seems to play a role in a grammatical operation: agreement. It has been observed since the beginning days of generative grammar that language structure is hierarchical and that linear order supposedly plays a very limited role in grammatical operations (mostly in morphology and phonology). With such a background, the existence of CCA is rather surprising if agreement is syntactic, since it is the linearly closest conjunct, rather than the other (sometimes hierarchically higher) conjunct that controls agreement.

The various proposals put forward for Type 1 CCA can be divided into two approaches. One approach acknowledges the role of linear order in agreement in addition to hierarchical relations, see Marušič (2007), Bhatt and Walkow (2013), Marušič et al. (2015). I will label this approach *the linear approach*. The other type of approach to CCA 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 and Puškar (2018) among others. In other words, the linear effect is derived from hierarchical relations within this approach. I will label this approach as *the non-linear approach*. One could argue that if these two approaches cover the

same set of data, i.e. are empirically equivalent, the non-linear approach would be conceptually superior since the grammar would only make reference to one kind of relation instead of two (see Murphy and Puškar 2018: p1218).

Although the majority of literature focuses on Type 1 CCA, CCA is also observed in Right Node Raising constructions (RNR). For example, Grosz (2015) reports that in Czech, when the T head agrees with two subjects with mismatching features (1SG and 2SG) in two CP conjuncts, it shows agreement with the second subject (2SG), as shown in (5). This construction will be labeled as *TP RNR* for the rest of the paper.

(5) Táňa je pyšná, že já, a Věra je ráda, že **ty**, ?**budeš** cestovat
Tanja is proud that I, and Vera is glad that **you**, **will.2sg** travel.inf
do Nigérie.
to Nigeria
'Tanja is proud that I, and Vera is glad that you, will travel to Nigeria.'
(Czech; Grosz 2015)

Another example of CCA in RNR comes from Hindi-Urdu. Bhatt and Walkow (2013) observe that when the verb is shared by two conjoined clauses, it shows agreement with the second and closest object as shown in (6) with F.SG.

(6) Ramesh-ne ek baksaa aur Sitaa-ne **ek thailii** **uthaa-yii**
Ramesh-ERG a box.M.SG and Sita-ERG a small.bag.F.SG lift-PERF.F
th-ii
be.PST-F.SG
'Ramesh had lifted a box and Sita had lifted a bag' (Hindi-Urdu; Bhatt and Walkow 2013)

Lastly, Shen (2018) observes that in the nominal RNR construction in (7), the shared noun *student* agrees with the singular feature within the second conjunct DP. I will label CCA observed in RNR as *Type 2 CCA*.

(7) Ten tall and **one** short **student** came from the U.S. (Shen 2018)

Type 2 CCA differs from Type 1 CCA in all three properties mentioned above: **i.** the DPs do not form a ConjP. The conjunction head mediates two larger constituents which do not participate in agreement themselves. For example, in (5), two matrix CPs are conjoined while agreement is between the embedded subjects and the embedded verb. In (6), two CPs are conjoined, while the agreement is between the objects and the shared verb. In (7), DPs are conjoined and the agreement is between the noun and the numerals. **ii.** The agreement target is internal to the ConjP, as opposed to Type 1 CCA. The shared auxiliary/verb in (5) and (6) and the shared noun in (7) are inside the ConjP. **iii.** Instead of the ConjP, the competing agreement controllers in Type 2 CCA are inside the conjuncts. For example, in (5) the embedded subjects *já* 'I' and *ty* 'you' both

agree with the shared auxiliary *budeš* 'will'. Neither the ConjP nor the conjunct CPs themselves participate in agreement.

Despite their differences specified above, the linear approach can capture both types of CCA. In particular, Bhatt and Walkow (2013) offer a unified account for Type 1 CCA in (3) and Type 2 CCA in (6) in Hindi-Urdu. How the non-linear approach fares with Type 2 CCA has not been addressed in the previous literature. In this paper, I will argue that analyses in the non-linear approach encounter difficulties in accounting for Type 2 CCA. In other words, the linear effect (at least in Type 2) CCA is not illusory. In Section 2, I will briefly illustrate how the linear approach accounts for Type 2 CCA. In Section 3, three accounts in the non-linear approach are discussed and I will show how they fall short in analyzing Type 2 CCA. Section 4 concludes.

2 Linear approach to CCA

2.1 Bhatt and Walkow (2013)

Bhatt and Walkow (2013) are the first to provide a unified account for both Type 1 CCA and Type 2 CCA. They discuss both agreement with conjoined objects and agreement with objects in RNR in Hindi-Urdu. In (8), the verb agrees with conjoined objects with mismatching gender features (masculine and feminine) and shows agreement with the second conjunct (masculine in (8-a) and feminine in (8-b)). In RNR constructions in (9), the verbs are shared by two conjoined constituents (vPs in (9-a) and TPs in (9-b)) and agree with the objects inside each conjunction. As seen, the shared verbs show agreement with the feminine object in the second conjunct.

(8) a. Ram-ne ek thailii aur **ek baksaa** aaj
Ram-ERG a bag.F and a box.M today
uthaa-yaa/*-yii/$^{???}$-ye.
lift-PFV.M.SG/-PFV.F/-PFV.M.PL
'Ram lifted a small bag and a box.' (Bhatt and Walkow 2013: 8b)

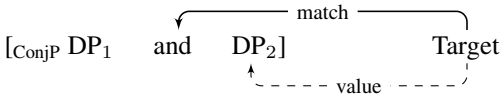
b. Ram-ne ek thailaa aur **ek petii** aaj
Ram-ERG a bag.M and a box.F today
uthaa-yii/*-yaa/-$^{??}$ye.
lift-PFV.F.SG/-PFV.M.SG/-PFV.M.PL
'Ram lifted a bag and a box.' (Bhatt and Walkow 2013: 9c)

(9) a. Rina-ne [kal ek batuaa] aur [aaj **ek saarii**]
Rina-ERG yesterday a purse.M.SG and today a sari.F
khariid-ii thii.
buy-PERF.F be-PST.F.SG
'Rina had bought a purse yesterday and a sari today.'

b. [Ramesh-ne ek baksaa] aur [Sitaa-ne **ek thailii**]
Ramesh-ERG a box.M.SG and Sita-ERG a small.bag.F.SG
uthaa-yii thii / *uthaa-ye th-e,
lift-PERF.F be-PST.F.SG / lift-PERF.M.PL be.PST.M.PL
'Ramesh had lifted a box and Sita had lifted a bag'
(Bhatt and Walkow 2013: 23)

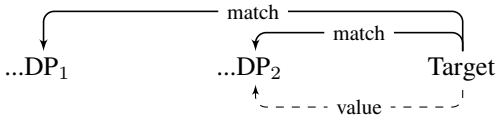
What is interesting in Hindi-Urdu is that there is a subject-object asymmetry regarding CCA in that only agreement with objects (both conjoined and in RNR) triggers CCA. Bhatt and Walkow (2013) account for the asymmetric CCA by proposing that Agreement involves two operations: MATCH which establishes the dependency between the agreement controller and target, and VALUE which copies the value from the controller to the target. They argue that although T MATCHES with the object ConjP for agreement (solid arrow in (10)), case on the object ConjP (assigned by *v*) makes its phi features inaccessible to VALUE T. As a repair, the operation VALUE is postponed to the PF after linearization. At this point, the feature on the linearly closest conjunct will be copied onto T, i.e. a CCA pattern (dashed arrow in (10)). This analysis accounts for Type 1 CCA in (8) with the help of linear order in determining the valuing agreement controller.

(10) Type 1 CCA in Bhatt and Walkow (2013)[2]



As Bhatt and Walkow (2013) note, the analysis extends to Type 2 CCA in RNR. The authors assume a multi-dominance structure for RNR where the shared verb MATCHES with both objects in the RNR remnants (solid arrows in (11)). Just as for conjoined objects, previously assigned cases make the objects inaccessible for VALUE. It is thus postponed to PF where the object in the linearly closest remnant VALUES the shared T head (dashed arrow in (11)). In sum, by utilizing linear order in agreement, Bhatt and Walkow (2013) provide a unified account for both Type 1 and Type 2 CCA.

(11) Type 2 CCA in Bhatt and Walkow (2013)



[2]In figures and trees in this paper, solid arrows indicate MATCH relation and dashed arrows indicate the VALUE operation. Since VALUE entails MATCH, when both relations are present between two elements, only dashed arrows are used in trees.

2.2 Marušič et al. (2015)

Marušič et al. (2015) focus on gender agreement with conjoined subjects in Slovenian and conducted written and spoken elicitation experiments (see also Marušič 2007, Willer Gold et al. 2018). They revealed that Slovenian allows three strategies when agreeing with conjoined plural subjects with mismatching gender features as shown in (12): **i.** default agreement, i.e. masculine plural (*odšli*); **ii.** CCA, i.e. first conjunct agreement with post-verbal subjects and last conjunct agreement with pre-verbal subjects (*odšla*); **iii.** highest conjunct agreement, i.e. first conjunct agreement with pre-verbal subjects (*odšle*).

(12) [Krave in teleta] so odšli /odšla /odšle na pašo.
cow$_{\text{F.PL}}$ and calf$_{\text{N.PL}}$ AUX$_{\text{PL}}$ went$_{\text{M.PL}}$ /$_{\text{N.PL}}$ /$_{\text{F.PL}}$ on graze
'Cows and calves went grazing.' (Marušič et al. 2015: 20)

To capture these three options, Marušič et al. (2015) propose that the ConjP in Slovenian has number features, but lacks gender features. When the agreement target MATCHES with the ConjP, the lack of gender feature on ConjP will either trigger default agreement or postpone the VALUE operation to PF.[3] In PF, when VALUE takes place after linearization, the linearly closest conjunct (the first conjunct in post-verbal subjects and the second conjunct in pre-verbal subjects) will be chosen. When VALUE takes place before linearization, the hierarchically closest conjunct (the first conjunct) will be chosen. Like the analysis in Bhatt and Walkow (2013), Marušič et al. (2015) also utilize VALUE in PF which is sensitive to linear order in accounting for Type 1 CCA.

Although not made explicit by Marušič et al. (2015), Type 2 CCA can be quite straight-forwardly accounted for by the operations proposed. Take TP RNR in Dutch, in (13), for example, where the embedded subjects mismatch in person and number features. The shared auxiliary shows agreement with the second subject, i.e. CCA.

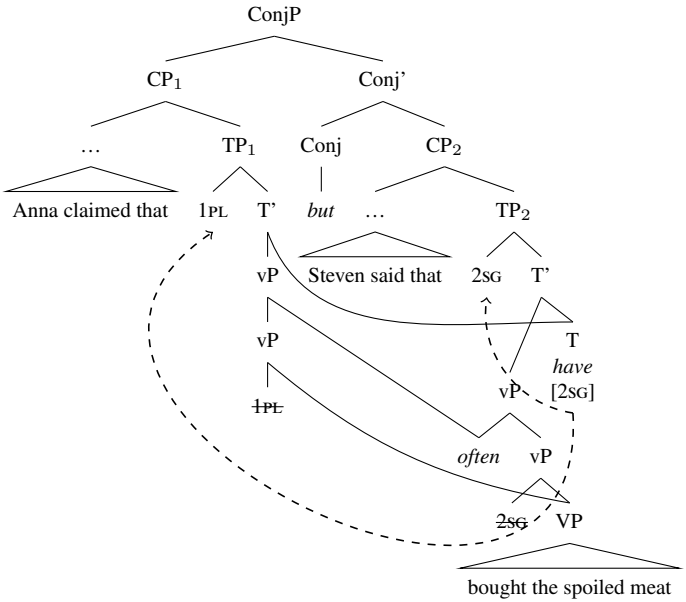
(13) Anna beweerde dat wij, maar Steven zei dat **jij**, vaak bedorven
Anna claimed that 1PL, but Steven said that 2SG, often spoiled
vlees **hebt**/*hebben gekocht.
meat have.2SG/*.PL bought
'Anna claimed that we, but Steven said that you, often bought spoiled meat.'
(Dutch; modified from (3) and (19) in the appendix of Kluck 2009)

I illustrate the multi-dominance structure for (13) in (14). Details irrelevant for the current discussion are left out. I refer the readers to Gračanin-Yuksek (2007), Kluck (2009), Bhatt and Walkow (2013), Grosz (2015), Shen (2018) for

[3] Marušič et al. (2015) use AGREE-LINK for MATCH and AGREE-COPY for VALUE.

the arguments for the multi-dominance structure. As shown, two matrix clauses are conjoined. The T head (*have*) is merged once but, via multi-dominance, simultaneously linked to both embedded clauses. Then T MATCHES with both embedded subjects (1PL, 2SG). The mismatching features on T, resulting through agreement with two subjects, cannot be resolved, thus VALUE is postponed to PF. In PF, if VALUE takes place before linearization, the choice of the controller cannot be determined according to the hierarchical closeness, since neither embedded subject c-commands the other. On the other hand, if VALUE takes place after linearization, the second embedded subject is chosen in VALUE, due to its linear proximity to the target. As a result, the auxiliary in (13) shows CCA in the similar way as depicted in (11).[4]

(14) structure of (13)



As shown in this section, the two analyses in the linear approach to CCA are able to provide a unified account for Type 1 and Type 2 CCA. The difference between the analyses proposed by Bhatt and Walkow (2013) and Marušič et al. (2015) lies in the trigger of the postponed valuation. In Hindi-Urdu, it is the inaccessibility of the feature of ConjP due to its case; whereas in Slovenian, it is the lack of gender feature on ConjP. I argue that in Type 2 CCA, as in (13),

[4]Conjoined subjects with mismatching features do not trigger CCA in (i), unlike (13). This is expected since in (i) the Conj head resolves the mismatching features on each subject to plural and T agrees with the resolved plural on the conjunction phrase.

(i) John and I are/*am coming to the party.

it is the mismatching feature values of the controllers. Despite the different triggers, the operation that made CCA possible, i.e. postponed VALUE as a repair strategy, is the common factor across the analyses discussed there. In sum, the unification of Type 1 and Type 2 CCA in this approach is ultimately made possible by recognizing the role linear order plays in determining the agreement controller. [5]

3 Non-linear approach to CCA

Apart from the linear approach to CCA, various analyses have been proposed for Type 1 CCA that do not make reference to linear order. Under such a non-linear approach, the linear effect in CCA is an illusion that can be exclusively derived with hierarchical relations. As mentioned above, if the non-linear approach is empirically equivalent to the linear approach to CCA, the former would be conceptually superior as it is purely syntactic (Murphy and Puškar 2018). I will evaluate three analyses within the non-linear approach and show that all three have difficulty in accounting for Type 2 CCA, unlike the linear approach.

3.1 Van Koppen (2005)

van Koppen (2005) surveys complementizer agreement with conjoined subjects in Germanic dialects. She observes that the complementizer can show agreement with the first conjunct of the conjoined subjects in certain dialects e.g. Tegelen Dutch, Waubach Dutch, and Bavarian. In Bavarian, in (15), for example, the complementizer can either show full agreement with the ConjP (2PL) or agreement with the first conjunct (2SG).

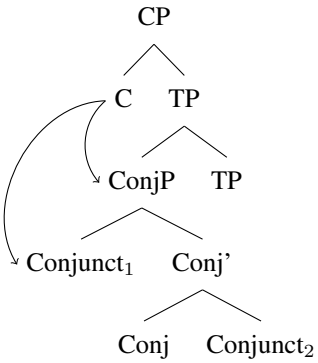
[5] Note that the conclusion relies on the multi-dominance analysis for TP RNR. If TP RNR involves ellipsis of the first embedded TP, the CCA pattern would be accounted for with no preference to linear order. Here I present an argument against the ellipsis analysis for TP RNR from Larson (2012). See Gračanin-Yuksek (2007), Kluck (2009), Bhatt and Walkow (2013), Grosz (2015), Shen (2018) for more arguments for multi-dominance and against the ellipsis analysis. If an ellipsis analysis for TP RNR were tenable, the intended reading of (i) should be available since morphological mismatches are allowed under ellipsis in general. The absence of the intended reading indicates TP RNR does not involve ellipsis.

(i) #Alice is happy that **Iris** ~~can spell **her** name~~, and Claire is proud that **Daniel**, can spell **his** name.
Intended reading: Alice is happy that Iris can spell Iris' name, and Claire is proud that Daniel can spell Daniel's name.

(15) ... **dass-ds/dass-sd** du und d'Maria an Hauptpreis
... that-2.PL/that-2.SG [you.SG and the Maria]$_{[2.PL]}$ the first.prize
gwunna hab-ds.
won have-2.PL
'...that Maria and you have won the first prize' (van Koppen 2005: (25), Bavarian)

van Koppen (2005) proposes that the CCA observed in (15) is actually **highest** conjunct agreement. The structure of complementizer agreement in (15) is illustrated in (16). It is assumed that the first conjunct in Spec,ConjP, and the ConjP itself are equally local to the agreement target, i.e. the C head. van Koppen (2005) argues that C agrees simultaneously with the first conjunct and the ConjP and spells out the feature with the most specific agreement morphology. In Bavarian, agreement morphology for 2SG and 2PL on the C head is equally specific[6], thus C optionally shows full agreement with ConjP and CCA with the first conjunct, as shown in (16).

(16) C [$_{\text{ConjP}}$ Conjunct$_1$ [and Conjunct$_2$]]



The analysis above has two components: **i.** the equidistance component, which makes the highest conjunct and the ConjP equally accessible to the agreement target; **ii.** the morphological specificity that determines which agreement form the target will end up having. Under this analysis, CCA results from choosing the more specific morphological form between two equally accessible agreement controllers. Unlike the linear approach discussed in the previous section, linear order plays no role in this analysis. The illusion of the linear effect stems from the fact that in structures like (16), the highest conjunct happens to be the

[6]Other feature specifications on C are not overtly marked in Bavarian, see (26) in van Koppen 2005.

linearly closest to the agreement target C.[7]

To evaluate whether this analysis can be extended to Type 2 CCA, one needs to compare the structures in (14) and (16). We can see that in TP RNR (14), neither the highest conjunct CP at Spec,ConjP position nor the ConjP itself are relevant for agreement on the embedded T, unlike (16). The structural relation between the highest conjunct CP and the ConjP in TP RNR is thus irrelevant. However, the agreement controllers, i.e. the embedded subjects, are equally local to the shared T in the multi-dominance structure, in other words, the equidistance component of van Koppen (2005)'s analysis is applicable in the structure in (14). Given that the embedded subjects are equally local to the agreement target, the morphological specificity component makes two predictions: **i.** the agreement target will show the more specific morphological form; **ii.** the choice of the agreeing subject would not be affected by linear order of the two.

Since both [2SG] and [PL] are overtly marked on the verb (as *hebt* and *hebben*), we would expect both forms to be available regardless of linear order of the subjects, similar to complementizer agreement in Bavarian (15). This prediction is not borne out. The pair of sentences in (17) are minimally different in the order of the subjects. In both sentences, the auxiliary shows agreement with the closest subject and never agrees with the first subject that is linearly further away.[8]

(17) a. Anna beweerde dat wij, maar Steven zei dat **jij**, vaak
Anna claimed that 1PL, but Steven said that 2SG, often
bedorven vlees **hebt**/*hebben gekocht.
spoiled meat have.2SG/*.PL bought
'Anna claimed that we, but Steven said that you, often bought spoiled meat.'

b. Anna beweerde dat jij, maar Steven zei dat **wij**, vaak
Anna claimed that 2SG, but Steven said that 1PL, often
bedorven vlees **hebben**/*hebt gekocht.
spoiled meat have.PL/*.2SG bought
'Anna claimed that you, but Steven said that we, often bought spoiled meat.'

This linear effect is observed in other cases of Type 2 CCA. As shown in Hindi-

[7] This paper focuses on Type 2 CCA and does not discuss the validity of analyses in the context of Type 1 CCA. See Bhatt and Walkow (2013) for an argument against van Koppen (2005)'s analysis of Type 1 CCA.

[8] In addition to experiment results on similar sentences in Kluck (2009), judgments of (17) are based on a forced choice survey conducted with five Dutch speakers. Four out of five speakers chose CCA.

Urdu in (18) and nominal RNR construction in English in (19), changing the linear order of the agreement controllers (objects in (18) and numerals in (19)) while keeping the hierarchical structure identical triggers change in agreement. In sum, the analysis proposed in van Koppen (2005) cannot account for Type 2 CCA.

(18) a. Ramesh-ne ek thailii aur Sitaa-ne **ek baksaa**
Ramesh-ERG a small.bag.F.SG and Sita-ERG a box.M.SG
uthaa-yaa/*-yii.
lift-PVF.M.SG/PVF.F
'Ramesh lifted a bag and Sita lifted a box.'

b. Ramesh-ne ek baksaa aur Sitaa-ne **ek thailii**
Ramesh-ERG a box.M.SG and Sita-ERG a small.bag.F.SG
uthaa-yii/*-yaa.
lift-PVF.F/PVF.M.SG
'Ramesh lifted a box and Sita lifted a bag.'

(19) a. Two tall and one short student/*students came from the U.S.
b. One tall and two short students/*student came from the U.S.

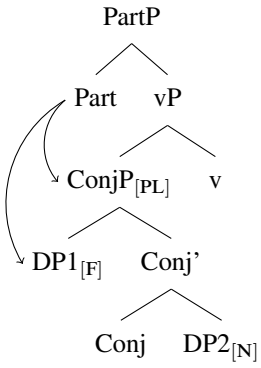
3.2 Bošković (2009)

Bošković (2009) focuses on Type 1 CCA in gender agreement in Bosnian-Croatian-Serbian (BCS). As shown in (20), the participle shows agreement with the second conjunct.

(20) Sva sela i **sve varošice** su **uništene/***uništena.
all villages.PL.N and all towns.PL.F are destroyed.PL.F/PL.N
'All villages and towns were destroyed.' (BCS, Bošković 2009: 5)

The proposed account is purely syntactic. Following Marušič (2007), Bošković (2009) assumes that the ConjP does not have gender features and the agreement target PART matches with ConjP for number and DP1 (the highest conjunct) for gender, shown in (21). The EPP feature on Part requires one agreement controller to be moved to the Spec,PartP position. In BCS, both DP1 and ConjP can, in principle, move. This ambiguity prevents movement of either DP1 or ConjP and undoes the MATCH operation. In the second attempt, Part matches with the ConjP for number and the DP2 for gender, shown in (22). Since the second conjunct cannot move in BCS, the only movable controller, the ConjP, is moved. The result sentence shows resolved number agreement and closest gender agreement, shown in (23). This analysis makes no reference to linear order in accounting for CCA. In other words, the relevance of linear proximity in CCA is an illusion.

(21)



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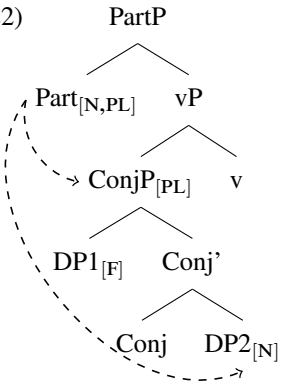

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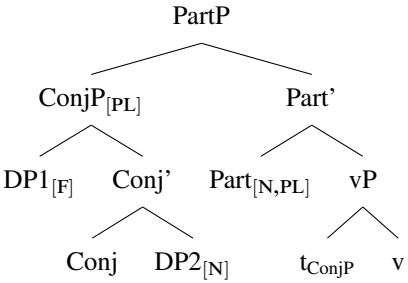


This analysis proposed for Type 1 CCA in BCS cannot be extended to Type 2 CCA due to the distinct structural properties of the constructions involved.[9] CCA in Bošković (2009)'s analysis relies on the disqualification of the first conjunction for agreement due to the movement ambiguity. This ambiguity is triggered by the fact that the two DPs form a ConjP and that the first (but not the second) conjunct can move out of the ConjP in BCS.

In Type 2 CCA, using TP RNR in (14) as an example, two embedded subjects do not form a ConjP and are equally local to the agreement target T. Moreover, the two embedded subjects do not differ in their mobility. Instead, the shared embedded T simultaneously matches with the first and the second embedded subject, both of which then move to their respective Spec,TP positions. In other words, agreement with the first embedded subject is not blocked in TP RNR. With both embedded subjects qualified for agreement, it is not clear how Bošković (2009)'s analysis would generate the CCA pattern in constructions like TP RNR.

[9] Bhatt and Walkow (2013) pointed out that Bošković's (2009) account does not extend to Type 2 CCA. Here we illustrate why that is the case.

3.3 Murphy and Puškar (2018)

Murphy and Puškar (2018) share the idea that the linear effect in CCA is an illusion, but propose a very different analysis for CCA in BCS than the one in Bošković (2009). They argue that the agreement patterns observed in BCS result from different orders of operations 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, the participle agrees with the ConjP. They assume that **i.** the order of the operations with 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 by the need to ↑AGR↑. The authors argue that this analysis generates all the attested patterns in BCS and rules out the unattested pattern, i.e. second conjunct agreement with the post-verbal subject. Different orders and the generated agreement patterns are summarized in Table 1.

order	**outcome**
MERGE ≫ ↑AGR↑ ≫ ↓AGR↓	resolved agreement with the pre-verbal subject
MERGE ≫ ↓AGR↓ ≫ ↑AGR↑	resolved agreement with the post-verbal subject
↑AGR↑ ≫ MERGE ≫ ↓AGR↓	second conjunct agreement with the pre-verbal subject (CCA)
↓AGR↓ ≫ MERGE ≫ ↑AGR↑	first conjunct agreement with the post-verbal subject (CCA)
↑AGR↑ ≫ ↓AGR↓ ≫ MERGE	first conjunct agreement with the pre-verbal subject (HCA)
↓AGR↓ ≫ ↑AGR↑ ≫ MERGE	first conjunct agreement with the post-verbal subject (CCA)

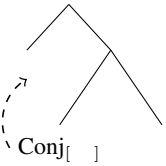
Table 1: orders and outcomes in Murphy and Puškar (2018)

The readers are referred to Murphy and Puškar (2018) for the detailed derivations of all the possibilities. In this paper, I use the second conjunct agreement with the preverbal subject in (24) as an example for CCA in their system, where the participle *prodata* 'sold' shows neuter agreement with the second conjunct *sva odela* 'all suits'.

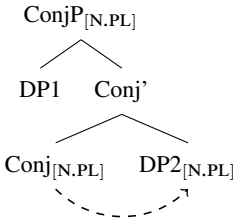
(24) [Sve haljine i **sva odela**] su juče **prodata**.
all dress.F.PL and all suit.N.PL are yesterday sell.PRT.N.PL
'All dresses and all suits were sold yesterday.'
(BCS; Murphy and Puškar 2018)

According to Murphy and Puškar (2018), the agreement pattern in (24) is generated with the order ↑AGR↑ ≫ MERGE ≫ ↓AGR↓. First, the Conj head agrees upward and does not find a DP, since MERGE of the conjuncts has not occurred yet, shown in (25). 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 (26). The resulting ConjP projects the feature of the second conjunct i.e. N.PL. External to the ConjP, since the order of ↑AGR↑ and ↓AGR↓ is constant inside and outside the ConjP, the PART head agrees upward first and triggers the movement of the ConjP to the Spec,PartP position, as shown in (27). After the movement, PART gets the N.PL feature from the ConjP. The result sentence (24) is one where the participle 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.

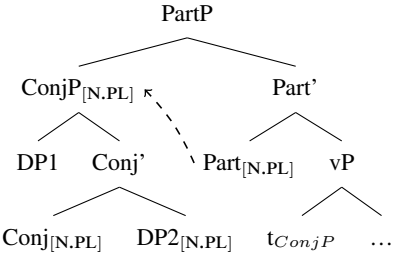
(25) ↑AGR↑ (ConjP internal)



(26) MERGE+↓AGR↓ (ConjP internal)



(27) ↑AGR↑ (ConjP external)



Although Murphy and Puškar (2018) can capture Type 1 CCA as illustrated above, it is unclear how their system would derive Type 2 CCA. The option of CCA in Murphy and Puškar (2018) comes from the fact that the two DPs form a ConjP. In (24), it is the order inside the ConjP (↑AGR↑ ≫ MERGE ≫ ↓AGR↓) that projects the N.PL feature of the second conjunct onto the ConjP,

which the Part head eventually agrees with. As discussed above, agreement controllers in Type 2 CCA constructions do not form the ConjP. Taking the multi-dominance structure of TP RNR in (14) as an example, since the Conj head does not participate in agreement, the order of operations between the ConjP and the conjuncts is not relevant for the derivation of CCA. The only agreement relation is between the T head and the embedded subjects. The fact that the embedded subjects precede the vP adjunct 'often' in (13) indicates that the embedded subjects have undergone EPP movement to Spec,TP positions. Since this movement is assumed to be triggered by ↑AGR↑ in Murphy and Puškar (2018), ↑AGR↑ must precede ↓AGR↓ in (14). Thus the mechanism proposed in Murphy and Puškar (2018) wrongly predicts that T agrees with both embedded subjects, rather than just the second subject.

Although the original analysis does not apply to Type 2 CCA, one can extend the idea of flexible ordering to more operations relevant to the construction at hand. For example, it can be conceived that the MERGE operation is further divided into merge of the first conjunct, MERGE_{C1}, and merge of the second conjunct, MERGE_{C2}. In (14), this would separate merging of CP1 and CP2. One can further assume that the two operations of MERGE and upward and downward agreement are sequentially ordered. There are 24 logically possible orders of these four operations. Six out of the 24 derivations can generate a CCA pattern, as listed in (28).

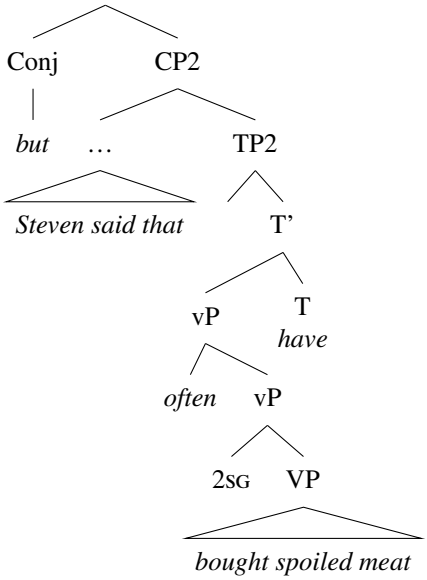
(28) $\text{MERGE}_{C2} \gg \uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C1} \gg \downarrow\text{AGR}\downarrow$
$\text{MERGE}_{C2} \gg \uparrow\text{AGR}\uparrow \gg \downarrow\text{AGR}\downarrow \gg \text{MERGE}_{C1}$
$\text{MERGE}_{C2} \gg \downarrow\text{AGR}\downarrow \gg \text{MERGE}_{C1} \gg \uparrow\text{AGR}\uparrow$
$\text{MERGE}_{C2} \gg \downarrow\text{AGR}\downarrow \gg \uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C1}$
$\uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C2} \gg \downarrow\text{AGR}\downarrow \gg \text{MERGE}_{C1}$
$\downarrow\text{AGR}\downarrow \gg \text{MERGE}_{C2} \gg \uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C1}$

In the rest of this section, I will illustrate one derivation in detail and argue that this extension to the ordering analysis causes more problems than it solves. Take TP RNR in Dutch in (29) as an example. Assuming the later agreement does not override the previous value, the order of $\text{MERGE}_{C2} \gg \uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C1} \gg \downarrow\text{AGR}\downarrow$ can generate a CCA pattern.

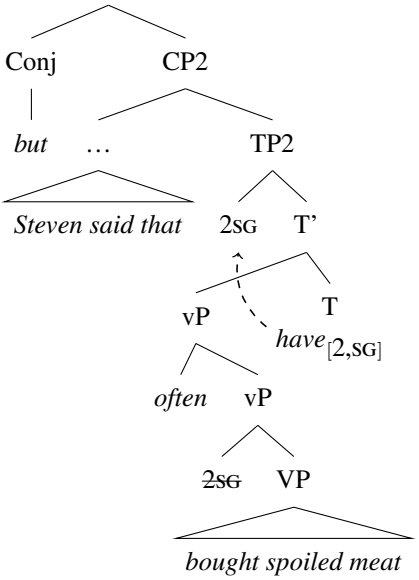
(29) Anna beweerde dat wij nooit, maar Steven zei dat jij vaak,
Anna claimed that 1PL never, but Steven said that 2SG often,
bedorven vlees hebt/*hebben gekocht.
spoiled meat have.2SG/.PL bought
'Anna claimed that we never, but Steven siad that you often, bought spoiled meat.'

The derivation starts with the the Conj head *but*. In (30), materials in CP2 are merged. In (31), T agrees upward, triggering the embedded subject to move to the Spec,TP position, and gets the [2SG] value. In (32), CP1 is merged. What is special about the multi-dominance structure is that several elements in CP1 merge with the existing structure in CP2. For example, the embedded subject in CP1 (1PL) merges with VP which is already merged in a previous derivational step. Lastly in (32), ↓AGR↓ occurs and T agrees with 1PL in its Spec,vP position. The value on T remains that of the second embedded subject, 2SG, showing an apparent CCA pattern.

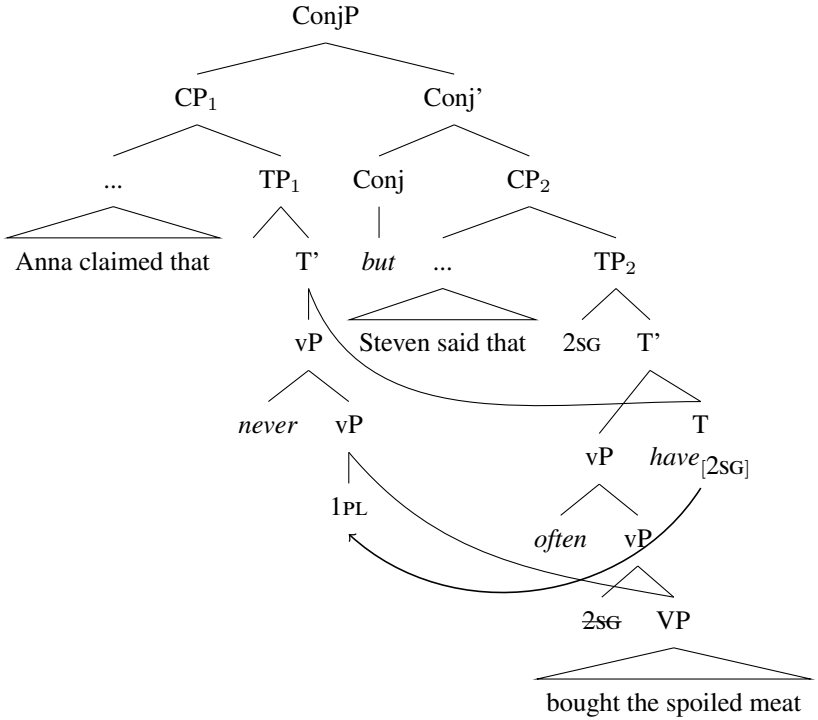
(30) MERGE$_{C2}$



(31) ↑AGR↑



(32) $\textsc{merge}_{C1} \gg \downarrow\textsc{agr}\downarrow$



Despite the CCA pattern, the derivation outlined above suffers from several issues. First, the sentence generated in (30)-(32) involves a wrong word order of the embedded subject in CP1 and the vP adjunct 'never.' As illustrated in (32), T agrees with the embedded subject in the CP1 via downward agreement, which does not trigger subject movement to Spec,TP. As a result, the subject in situ would follow the vP adjunct 'never' at the edge of the vP. The generated sentence shown in (33) is not acceptable and the sentence in (29) cannot be generated in this derivation. It is important to note that this problem is not unique to the particular order illustrated above. None of the possible orders in (28) can generate (29) with the CCA pattern and the correct order between vP adjuncts and subjects.[10]

[10]A further set of 24 orders of the four operations can be constructed if we assume that a later agreement operation can override the valuation from an earlier agreement operation. Out of these 24 orders, six can generate the CCA pattern in TP RNR. None of these six orders can generate the right word order of (29) either.

(33) *Anna beweerde dat nooit wij, maar Steven zei dat jij vaak,
Anna claimed that never 1PL, but Steven said that 2SG often,
bedorven vlees hebt gekocht.
spoiled meat have.2.SG bought
'Anna claimed that never we, but Steven siad that you often, bought spoiled meat.'

Second, if the order $\text{MERGE}_{C2} \gg \uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C1} \gg \downarrow\text{AGR}\downarrow$ is available in deriving the TP RNR construction, this order should also be available in agreement with conjoined subjects as in (34). As shown, when two singular DPs are conjoined, the verb must be plural, i.e. resolved agreement, and not singular. Interestingly, none of the six orders that can derive CCA in TP RNR in (28) can derive the acceptable sentence in (34). For example, the order discussed above in (30)-(32), $\text{MERGE}_{C2} \gg \uparrow\text{AGR}\uparrow \gg \text{MERGE}_{C1} \gg \downarrow\text{AGR}\downarrow$, makes a prediction that the Conj head will not get any value, contrary to the fact.

(34) Anna en Roos kochten/*kocht een huis.
Anna and Roos bought.PL/.SG a house
'Anna and Roos bought a house.' (Dutch; Kluck 2009: (2))

In sum, I have shown that Type 2 CCA cannot be derived by assuming flexible orders of various operations, as proposed by Murphy and Puškar (2018). An extended version of the account suffers from both empirical and conceptual problems. It is worth pointing out that the extension outlined above is but one option and is not meant to be exhaustive. The current paper cannot exclude all other extensions that might potentially account for Type 2 CCA. Such extensions would have to be evaluated individually.

In this section I discussed three well established accounts for Type 1 CCA which do not make reference to linear order, and showed that none of the analyses can derive Type 2 CCA in a straightforward manner. This establishes that Type 2 CCA poses a challenge for unifying the two types of CCA under the non-linear approach at its current stage.[11]

4 Linear order in CCA

This paper illustrated the difficulties that the non-linear approach encounters in analyzing Type 2 CCA. Unifying the two types of CCA thus poses a non-trivial

[11] In addition to the works mentioned in this section, Aoun et al. (1994), Munn (1999), Aoun et al. (1999) discuss first conjunct agreement in dialects of Arabic. Aoun et al. (1994, 1999) argue that FCA of the conjoined subjects is derived from clausal coordination and ellipsis. This does not apply to Type 2 CCA because ellipsis has been argued against as a viable analysis for Type 2 CCA (see Kluck 2009, Shen 2018). As a result, discussion of this analysis is left aside.

challenge for such an approach. Rather, we showed that by acknowledging the role that linear order plays in grammar, the linear approach can account for both types of CCA in a unified manner. The claim that linear order is an illusion relies on the premise that CCA patterns can be accounted for without referencing to linear order. What we have shown is that CCA in RNR cannot be accounted for in such a linear-order-free grammar. Consequently, the linear effect in CCA is not an illusion.

As mentioned above, if the linear approach and the non-linear approach were empirically equivalent, the latter would be considered superior on the conceptual ground in that it only involves operations within narrow syntax. Although this paper has shown that the non-linear approach falls short in accounting for Type 2 CCA, it is still possible to analyze Type 2 CCA with the linear approach and maintain the non-linear approach for Type 1 CCA (see a recent empirical argument for Murphy and Puškar 2018 and against Marušič et al. 2015 in Shen 2023). However, the fact that linear order plays a role in *some* part of grammar indirectly weakens this conceptual argument for the non-linear approach.

It is worth noting that the approaches to CCA discussed in this paper are *grammatical* analyses. At the same time, Keung and Staub (2018) and Willer Gold et al. (2018) recently argue that Type 1 CCA involves operations in language processing where linear proximity plays a non-trivial role (see also Shen and Yoo 2023). The current paper leaves the possibility of a processing analysis for Type 2 CCA for future research.

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