Closest Conjunct Agreement in Head-Final Languages

Title: Closest Conjunct Agreement in Head-Final Languages

Names of authors: Elabbas Benmamoun[1], Archna Bhatia[1], Maria Polinsky[2]

Affiliations: University of Illinois Urbana-Champaign[1], Harvard University[2]

Current mailing addresses: [1] Department of Linguistics, 4080 Foreign Languages Building, 707 S Mathews Av, Urbana, IL 61801, USA; [2] Department of Linguistics, Boylston Hall, Harvard University, Cambridge, MA 02138, USA

.

Email addresses: benmamou@illinois.edu; bhatia@illinois.edu; polinsky@fas.harvard.edu

Closest Conjunct Agreement in Head Final Languages[1]

Elabbas Benmamoun, Archna Bhatia, and Maria Polinsky

We discuss the phenomenon of closest conjunct agreement with a special focus on head-final languages. We present data from two such languages, Hindi and Tsez, which allow agreement with the rightmost conjunct. This contrasts with head-initial languages, such as Arabic, where close conjunct agreement is with the leftmost conjunct in clauses with VS order. This asymmetry raises a number of questions that we will discuss. First, is the typological difference between head-initial and head-final languages in the context of coordination due to a difference in the structure of coordination in these two groups? Second, to what extent is the syntactic configuration relevant to the computation of closest conjunct agreement? Third, what is the role of linear adjacency in closest conjunct agreement? These questions have wider implications for the analysis of agreement and the relation between syntax and the morpho-phonological component. In this paper, we consider agreement in the context of coordination and explore the interaction between hierarchical relations, such as Agree, and linear adjacency/proximity in closest conjunct agreement.

Keywords: Closest conjunct agreement, Agree, Linear adjacency/proximity, Hindi, Tsez, coordination, head-final

[1] We would like to thank Bernard Comrie, Grev Corbett, Heidi Lorimor, Keith Plaster, and the audience at the 2009 Annual Meeting of the Linguistic Society of America for helpful comments. The Tsez data are courtesy of Arsen Abdulaev, Madjid Xalilov, Ramazan Rajabov, and Paxrudin Magomedinov. All errors are our sole responsibility.

1. Closest conjunct agreement

In languages such as Moroccan Arabic or Lebanese Arabic, there are two patterns of agreement in the context of coordination. In clauses with SV order the verb must agree with both conjuncts (full agreement):

(1) a. *ʕomar w Kariim ža (Moroccan Arabic)

Omar and Karim came.III.MASC.SG

b. ʕomar w Kariim žaw

Omar and Karim came.III.PL

'Omar and Karim came.'

In clauses with VS order, by contrast, the verb can agree with either the leftmost conjunct (2a) or with both conjuncts (2b):

(2) a. ža ʕomar w Kariim (Moroccan Arabic)

came.III.MASC.SG Omar and Karim

'Omar and Karim came.'

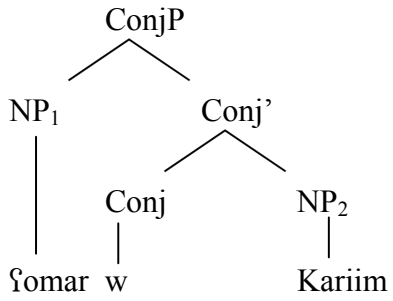
b. žaw ʕomar w Kariim

came.III.PL Omar and Karim

'Omar and Karim came.'

To account for the asymmetry between the behavior in clauses with SV and VS order with respect to closest conjunct agreement (CCA), Benmamoun (1992) argues that in the SV order agreement is through Spec-head agreement but in the VS order agreement is by means of government, a relation that obtains between the verb and the complete conjoined phrase and its specifier, if we assume an asymmetric structure of coordination as in (3).

(3)



This analysis drew on the assumption that the agreement relation is always based on the configuration relation between the two agreeing elements and that both Spec-head agreement and government are relations that a language may employ to realize the agreement relation, in much the same way as Case assignment was accounted for under earlier Principles and Parameters analyses.[2]

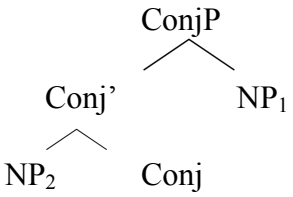
A slightly different analysis is provided by Johannessen (1996), who assumes a similar structure for coordination in head-initial languages. Under this approach, CCA is analyzed as a result of agreement with ConjP; it only appears that agreement is with the closest conjunct since the features of the conjunct in the specifier (NP_1) are transferred to the head (Conj) through the

[2] For example, nominative Case was assumed to require a Spec-head relation while accusative Case was assumed to require a government relation in English. By contrast, Koopman and Sportiche (1991), propose that in the VS order in Arabic, nominative case is assigned under government (on a par with the accusative).

Spec-head configuration and then further percolate up to the ConjP (this is an instance of unbalanced coordination). Agreement with both conjuncts is also achieved through agreement with ConjP but this happens in balanced coordination, where the features of both conjuncts are resolved and inherited to the ConjP.

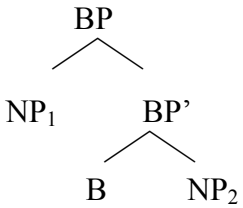
For head-final languages, she assumes that specifiers appear on the right of the head as shown in (4) below. Thus, CCA is predicted to be with the last conjunct in head-final languages due to the specifier (NP_1) being the last conjunct. Notice that the conjunction head Conj appears to the right of the second conjunct (NP_2), which is consistent with a head-final structure for coordination.

(4)



Munn (1999, 2000) also capitalizes on an asymmetric structure of coordination, though one that is different from Johanessen's. He assumes an adjunction structure of coordination where a conjunct (NP_2) is part of a Boolean Phrase with the head B (conjunction), and this phrase is then adjoined to the other conjunct (NP_1) on the right in languages such as Arabic.

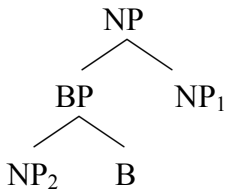
(5)



The presence of two agreement patterns (CCA and Full Agreement) is then explained as a result of the availability of different configurations for agreement. According to Munn, Full Agreement is a result of normal conjunct-resolution rules. However when agreement is achieved through government (in the VS order), which can only "see" the governed element, the conjunct resolution rules can be overridden, resulting in agreement with the conjunct visible to government (CCA). In the SV order where we get the Spec-head agreement configuration, more than one conjunct is visible, and this results in full agreement. [3]

For head-final languages, the BP-adjunction takes place to the left as in (6). As a result the entire coordinated phrase is a projection of the last conjunct. Thus, CCA is expected to take place with the last conjunct in head-final languages.

(6)



In all of the above accounts, the main assumption is that coordination in the context of CCA is phrasal and that an asymmetric structure allows access to only one conjunct, namely the leftmost conjunct in head-initial languages and the rightmost conjunct in head-final languages. The non-prominent conjunct is expected not to be accessible to agreement because it is deeply embedded within the configuration of coordination.

However, Aoun, Benmamoun, and Sportiche (1994, 1999) discuss arguments and data

3 Since Minimalism dispenses with government as a crucial notion, Munn (2000) suggests that the difference might be due to Attract F or Agree without movement (for what was previously accounted for under government configurations); or Move or Agree+Move (for the Spec-head configurations assumed in earlier frameworks).

that seem to challenge the government-based accounts. One conceptual argument, in the spirit of the Minimalist Program, questions reliance on both government and Spec-head to implement the agreement relation. The government relation, very much like the ECM relation, does not rely on any basic relations, such as that between a head and its specifier or complement. The leftmost conjunct in (3) is neither the complement nor the specifier of the head that hosts the verb. Another argument is that, if we assume the internal subject hypothesis, the subject is already in a Spec-head relation with the verb, in which case we should expect full agreement with both conjuncts regardless of the surface order that may result due to the movements of the subject and the verb. However, the most serious challenge comes from agreement in the context of number-sensitive items such as collective predicates and binominals. Aoun et al. show that in Moroccan Arabic and Lebanese Arabic, agreement with both conjuncts is required in the presence of such items, as illustrated in (7) and (8).

(7) a. *tlaqa ʕomar w Kariim (Moroccan Arabic)

meet.III.MASC.SG Omar and Karim

b. tlaqaw ʕomar w Kariim

meet.III.PL Omar and Karim

'Omar and Karim met.'

c. ʕomar w Kariim tlaqaw

Omar and Kariim meet.III.PL

'Omar and Karim met.'

(8) a. *lʕəb ʕomar w Kariim bžužhum

play.III.MASC.SG Omar and Karim together

b. lʕəbu ʕomar w Kariim bžužhum

play.III.PL Omar and Karim together

'Omar and Karim played together.'

c. ʕomar w Kariim lʕəbu bžužhum

Omar and Karim play.III.PL together

'Omar and Karim played together.'

To deal with this problem, Aoun et al. propose that in the context of CCA, the coordination is actually clausal rather than phrasal, contra Benmamoun (1992). The reason why number-sensitive items cannot occur in the context of CCA with singular subjects is due to incompatibility between a singular subject and the number-sensitive items, which require a plural subject. In clauses with SV order, by contrast, the coordination can only be phrasal, which explains full agreement on the verb.

This analysis allows Aoun et al. to maintain a Spec-head analysis of agreement in Arabic, which is simpler since it does not have to introduce a disjunction with regard to the configurations that can license agreement. However, this analysis has been challenged due to the fact that in a number of languages, number-sensitive items are allowed in the context of CCA. Most current accounts (Soltan 2006, van Koppen 2007, Bošković 2009) assume that CCA arises in the context of phrasal coordination itself (instead of clausal coordination). The details of the analyses may vary but two critical assumptions underpin them all. First, the structure of phrasal coordination is not symmetric but rather asymmetric, with prominence given to the leftmost conjunct in head-initial languages as in (3). Second, only one syntactic relation, Agree, is allowed in the context of agreement, which is essentially an update of the government relation.

Under these analyses, CCA is assumed to be a result of the fact that the first conjunct is higher or more prominent in head-initial languages and hence its features are accessible under the Agree relation between V/T and the leftmost conjunct.

2. Closest conjunct agreement in two head-final languages: Hindi and Tsez

Before we begin looking at the agreement facts in Hindi and Tsez, we would like to point out that these languages belong to two different language families and separate linguistic areas, yet they seem to show some similarities with respect to CCA (however there are some differences as well). We begin with a few general remarks about the two languages.

Hindi is an Indo-Aryan language, spoken mainly in the northern parts of India. Tsez is a Nakh-Dagestanian language, spoken in the north eastern Caucasus. Both languages show ergative-absolutive alignment, however Hindi is a split ergative language based on aspect distinctions (perfective *vs*. non-perfective) whereas Tsez is consistently ergative. Both are head-final languages with flexible word order at the root-clause level. Both have mainly agglutinative morphology.[4]

In Hindi, verbs and auxiliaries agree with the absolutive DP. All aspect markers (affixes or separate auxiliaries) and the past tense auxiliary agree in number and gender, but not person (9a). The present tense auxiliary agrees in number and person, but not gender (9b), while the future tense auxiliary agrees in number, gender and person features (9c).

(9) a. main/tuu/veh jaa-taa thaa (Hindi)

[4] In this paper, we concentrate on verbal agreement only. It would also be interesting to see how agreement with determiners (the so-called "concord") is realized in the context of coordination. Tsez does not have determiners. Hindi has determiners (demonstratives) that show agreement; our preliminary results suggest that CCA is possible with determiners too. We leave a complete analysis of CCA on determiners for future work.

I/you/he go-HAB.MSG PAST.MSG

'I/you/he used to go.'

b. main jaa-taa huuN

I(M/F) go-HAB.MSG pres.ISG

'I (M/F) go.'

c. main vahaaN huuN-gii/*huuN-gaa

I there PRES.1SG-FUT.FEM/*FUT.MASC

'I(F) will be there.'

In Tsez, verbs/participles as well as auxiliaries also show agreement with the absolutive argument present in the sentence. They agree in gender (noun class) and number,[5] with four genders in the singular and two in the plural:

(10) Gender agreement prefixes in Tsez

	sg	pl
I	Ø-	b-
II	y-	r-
III	b-	
IV	r-	

In what follows, observe two simple cases of agreement with the absolutive subject and absolutive object:

5 Tsez agreement, which is prefixal, is only visible on a subset of vowel-initial verbs (see Polinsky and Comrie 1999 for details).

(11) a. kid y-ays (Tsez)

girl.ABS.II II-came

'The girl came.'

b. už-ā kid y-egirsi

boy-ERG girl.ABS.II II-sent

'The boy sent the girl.'

Now, let us consider agreement in the context of coordination in both languages. Verbs in both languages may show resolved agreement with the conjoined NP, as shown in (12). [6]

(12) a. oh par us-ne to kelaa aur garii khaa liye ! (Hindi)

Oh but he-ERG EMPH banana.ABS.MASC.SG and coconut.ABS.FEM.SG eat take-PERF**.MASC.PL**

'Oh, but he ate the banana and the coconut!'

b. kid-no uži-n b-ik'is (Tsez)

girl.ABS.II-and boy. ABS.I -and **IPL**-went

'A girl and a boy went.'

Under the previous analyses of CCA, in head-final languages, CCA is expected to be with the last conjunct. We see that both these languages do show last conjunct agreement (LCA) as illustrated in (13). The critical agreement features are indicated in bold.

6 Gender resolution in both languages follows the so-called virile rule (Corbett 1990). In Hindi, gender resolution of an MASC feature and an FEM feature results in MASC. In Tsez, gender resolution of a class I (male) feature and any other class feature results in class I plural feature.

(13) a. main-ne ek chaataa aur ek **saaRii** khariid-**ii** (Hindi)
I- ERG an umbrella.ABS.MASC.SG and a saaree.ABS**.FEM.SG** buy- PERF**.FEM.SG**
'I bought an umbrella and a saree.' (Kachru 1980: 147)

b. kid-no **uži-n** **Ø**-ik'i-s (Tsez)
girl. ABS.II -and boy. ABS.**I**-and **I**-went
'A girl and a boy went.'

CCA obtains with finite verbs, participles as well as adjectives. Example (14) illustrates CCA with adjectives.

(14) a. haath aur Taang niilii hai (Hindi)
hand.ABS.MSG and leg.ABS**.FEM.SG** blue. **FEM** PRES.SG
'The hand and the leg are blue.'

b. nāsin ɣˤʷay-bi-n ža k'etu-n b-igu yoł (Tsez)
all.ABS dog- ABS.PL-and this cat. ABS.**III**-and **III**-good be.PRES
'All (these) dogs and this cat are good.'

In short, head-final languages such as Hindi and Tsez display CCA with the rightmost conjunct. This is as predicted if coordination has an asymmetric structure, as in (4) or (6), with the rightmost conjunct being the most prominent structurally and thus accessible under Agree. In the next section, we will show that this analysis does not always work.

3. Agree and adjacency

As mentioned above, CCA has been considered the result of a structural relation (Agree in the recent analyses) between the V/T and the closest conjunct—specifically, due to the fact that the closest conjunct is also the highest conjunct and thus structurally closer to the V/T than the other conjunct(s) is (/are). However, most of the coordination data considered in these analyses came

from head-initial languages. The prediction is that the structure of coordination in languages where CCA is with the rightmost conjunct should be the mirror image of the structure of coordination in head-initial language.

3.1 Structure of coordination in Hindi and Tsez

Benmamoun and Bhatia (2009) show that the structure of coordination in Hindi is indeed asymmetric but with the leftmost conjunct being structurally more prominent, i.e., having a structure like in (3) or (5) rather than the structure in (4) or (6). We will discuss here two types of evidence in favor of the asymmetric structure.

The first argument for the leftmost conjunct being structurally more prominent is based on binding. This argument for the structure of coordination was first used by Munn (1999) to show the higher structural position of the first conjunct for English, where the leftmost conjunct binds (and accordingly must c-command) the other conjuncts to its right. The same binding obtains in Hindi and Tsez, as shown below:

(15) a. **har aadmii$_i$** aur **us$_i$**-kaa kuttaa bazaar ga-yaa (Hindi)
every man$_i$.MASC.SG and he$_i$-of dog.MASC.SG market go-PERF.MASC.SG
'Every man and his dog went to the market.'

b. ***us$_i$**-kaa kuttaa aur **har aadmii$_i$** bazaar ga-yaa
he$_i$-of dog.MASC.SG and every man$_i$.MASC.SG market go-PERF.MASC.SG

(16) a. už-ā **kinnaw ħalmaγ-bi-n** nesā nesis eniw-no b-ayersi (Tsez)
boy-ERG all friend-PL.ABS-and self.GEN mother.ABS-and IPL-brought
'The boy brought all his friends and their mothers.'

b. *už-ā **nesā nesis eniw-no** kinnaw ħalmaγ-bi-n b-ayersi
boy-ERG self.GEN mother.ABS-and all friend-PL.ABS-and IPL-brought

In (15a) and (16a) the leftmost QP conjunct binds the bound pronoun in the second conjunct.

Under the standard assumptions of syntactic analyses of binding, this implies that the leftmost conjunct c-commands the rightmost conjunct—i.e., the first conjunct is structurally more prominent than the second conjunct. This is not expected if the structure of coordination in Hindi and Tsez is as in (4) or (6), but it is exactly what should be expected if the structure of coordination is as in (3) or (5).

Another argument discussed in Benmamoun and Bhatia (2009) and based on similar data from English discussed in Munn (1999) comes from extraposition.[7] Consider the Hindi sentences in (17).

(17) a. John-ne kal **ek kitaab aur ek mægziin** khariid-ii (Hindi)
John-ERG yesterday **one book.**FEM.SG **and one magazine.**FEM.SG buy-PERF.FEM.SG
'Yesterday John bought a book and a magazine.'

b. John-ne kal **ek kitaab** $\mathbf{t_i}$ khariidii, **[aur ek mægziin]$_i$**
'Yesterday John bought a book, and a magazine.'

c. *John-ne kal $\mathbf{t_i}$ **ek mægziin** khariidii, **[ek kitaab aur]$_i$**
(lit.: "Yesterday John bought a magazine, a book and.")

d. *John-ne kal **[ek kitaab aur] t** khariidii, **[ek mægziin]**
('Yesterday John bought a book and a magazine.')

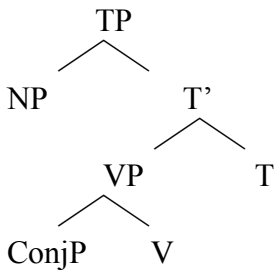
In (17b) the coordination particle and the rightmost conjunct can be extraposed to the right of the

[7] An additional argument based on prosody (also used by Munn (1999) for English) is presented in Benmamoun and Bhatia (2009) to support a structure of coordination where the leftmost conjunct is structurally higher than the other conjunct in head-final Hindi. The interaction between prosody and CCA is clearly a promising but little known area, and we leave it for future investigation. See also fn. 11.

verb.[8] This implies that the two form a sub-constituent independent of the leftmost conjunct, which is exactly what should be expected if the latter is structurally higher and more prominent.

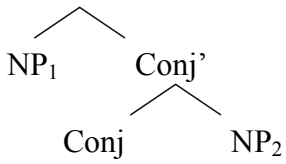
Thus, we see that head-final Hindi and Tsez have the leftmost conjunct in a structurally higher position than the other conjunct(s), just as seen in head-initial languages such as Arabic and English. But this leads to a paradoxical situation. Under the existing analyses discussed above, CCA in Hindi and Tsez would seem to indicate that the *rightmost* conjunct is more prominent because it is this conjunct (but not the others) that can enter into an agreement relation with V/T when the coordination precedes the verb (we will use SV as a shorthand for this order). On the other hand, binding and prosody tests, which have been used to argue for the prominence of the leftmost conjunct in head-initial languages, indicate that it is the *leftmost* conjunct that is indeed configurationally prominent in Hindi and Tsez. Assuming the structure of coordination as in (5) above, V/T should then be expected to agree with the *leftmost* conjunct since it is the most prominent noun phrase, but this is not the case. Instead we find agreement with the rightmost conjunct, even though it is not the structurally prominent NP in the coordination structure. Consider the part of the Hindi coordination structure shown in (18), where the verb agrees with the absolutive object within the VP (ConjP). [9]

(18)



8 Since in Tsez the coordination particle attaches to each conjunct, such a test is simply impossible.

9 We are assuming that the basic structure of the VP in head-final languages is generated with the object as a left sister to the verb.



In (18), T c-commands ConjP and NP_1. Under all of the previous analyses mentioned above, if there is CCA in Hindi we should expect to find it with NP_1 rather than NP_2 because NP_1 is in a closer Agree relation with T(+V) than NP_2; however, we find CCA with NP_2 rather than with NP_1. In addition, it is clear that NP_1 is active (and not incapable of participating in an agreement relation) based on the fact that agreement with both conjuncts is an option in Hindi, which can only be possible if the features of NP_1 are visible and accessible.[10]

In short, while Hindi and Tsez pattern with Arabic with respect to the structure of coordination (cf. (15) and (16) which show that in both languages the leftmost conjunct c-commands the other one), they differ from Arabic in that Arabic only allows CCA with the leftmost conjunct to the right of the verb while Hindi and Tsez also allow CCA with the rightmost conjunct to the left of the verb. Thus, in view of the fact that even in the head-final languages Hindi and Tsez it is the first conjunct that is, in fact, structurally higher/ more prominent than the other conjunct, it is not clear how an Agree account based on an asymmetric structure of coordination would be able to account for last conjunct agreement. Clearly, V/T is not in an Agree relation with the rightmost conjunct in Hindi and Tsez. Based on the facts we have, it seems that a purely Agree based account cannot adequately deal with CCA, at least in some head-final languages. The question then is what accounts for CCA in these languages and

10 See Bošković (2009) for an analysis that develops a mechanism that renders the most prominent conjunct somewhat inert, which in turn allows the second conjunct to participate in the agreement relation. He argues that this is the case in clauses with SV order in Serbo-Croatian, where agreement can be with the rightmost conjunct to the left of the verb. Below, we discuss similar cases in Hindi and Tsez.

whether Agree is still necessary.

We believe that both Agree and linear adjacency are necessary for a proper analysis of CCA. Specifically, we propose that once Agree targets ConjP for agreement with the T(+V) head, linear adjacency plays a role in PF in determining what member of the ConjP can spell-out the agreement features. Linearly, both ConjP and NP_2 are close to the T(+V) head and thus can help spell-out the agreement features; in Hindi and Tsez, both are used. CCA in Moroccan Arabic and Lebanese Arabic clauses with VS order can be explained in the same way by recognizing that in such clauses it is the leftmost conjunct that is adjacent to the agreeing head, while in Hindi and Tsez, in the SV order it is the rightmost conjunct that is typically adjacent to the agreeing head. In sum, agreement happens twice: Agree establishes the relation with the ConjP agreement controller in syntax, and in PF, adjacency may give privilege to the most adjacent conjunct NP in the spell-out of the agreement features.[11] This view of agreement, which can be characterized as compositional (agreement happens twice), allows for variation precisely because one of the two components where agreement is established and verified may be at odds with the other.

Our analysis therefore differs from the previous analyses of CCA in that we do not assume that Agree takes place with the structurally closest conjunct but rather with the whole coordinated phrase. It is in the PF component that the agreement relationship established in the syntactic component (through Agree) is satisfied by spelling out the features, which may optionally be affected by the PF condition of linear adjacency/proximity.

11 It would be important to see if there is a prosodic relation between the verb and the most adjacent conjunct. We suspect that this is the case but this can only be confirmed through a prosodic study. If it turns out that there is a prosodic relation between the two elements we would have good reasons for attributing CCA to spell-out at PF because we expect that component to be sensitive to such relations.

Under the proposal developed here, the syntactic relation of Agree still is a prerequisite for CCA. To see this, consider the following sentences in Hindi given in (19). Recall that in Hindi the verb (or the T+V complex) agrees with the highest absolutive argument. In (19a), the coordinated phrase *sofe aur kursii* is the highest absolutive argument (the subject *raam-ne* is ergative-marked). Hence CCA can take place with a member of this coordinated phrase under linear adjacency/proximity. In the non-ergative (19b), on the other hand, the highest absolutive argument is the subject *raam* itself, and thus agreement can only take place with this argument even if the object is clearly more adjacent to the verb—the object in this construction never triggers agreement.

(19) a. raam-ne sofe aur kursii khariid-ii (Hindi)
Ram-ERG sofa.ABS.MASC.PL and chair.ABS.FEM.SG buy-PERF.**FEM.SG**
'Ram bought sofas and chair.'

b. *raam sofe aur kursii khariid-egii
Ram sofa.ABS.MASC.PL and chair.ABS.FEM.SG buy-FUT.FEM.SG
'Ram will buy sofas and chair.'

The role of adjacency seems to be more pervasive in Hindi and Tsez than in Arabic. Recall that in Arabic, CCA takes place only in clauses with VS order, i.e., where the verb precedes ConjP. In Hindi and Tsez, by contrast, CCA obtains when the verb follows the ConjP as well as when it precedes it. These two patterns are illustrated in (20) and (21) respectively.

Pattern I: Last Conjunct Agreement with preceding ConjP: [$_{\text{ConjP}}$ DP_1 & DP_2] V

(20) a. kid-no **uži-n** **Ø**-ik'i-s (Tsez)
girl.ABS .II-and boy. ABS.**I**-and **I**-went
'A girl and a boy went.'

b. main-ne ek chaataa aur ek **saaRii** khariid-**ii** **(**Hindi)

I-ERG an umbrella.ABS.MASC.SG and a saaree.ABS**.FEM.SG** buy-PERF.FEM.SG

'I bought an umbrella and a saree.' (Kachru 1980: 147)

Pattern II: First Conjunct Agreement with following ConjP: V [$_{ConjP}$ DP_1 & DP_2]

(21) a. y-ik'i-s **kid-no** uži-n (Tsez)

II-went girl.ABS .**II** -and boy.ABS.I.-and

'A girl and a boy went.'

b. Raam-ne kyaa khariid-aa! us-ne khariid-**ii** (Hindi)

Ram-ERG what.MASC.SG buy-PERF.MASC.SG he-ERG buy-PERF **FEM.SG**

kursii aur sofa, jo us-e ham-ne manaa ki-yaa thaa

chair.ABS**.FSG** and sofa.ABS**.**MSG which he-DAT we-ERG forbid do-PERF.MAC.SG PAST.MASC.SG

V Conjunct1 & Conjunct2

'What did Ram buy! He bought the chair and sofa, which we had forbidden him (to buy)!'

Notice that when the verb follows ConjP, CCA is with rightmost conjunct (20). On the other hand, when the verb precedes ConjP, CCA is with the leftmost conjunct (21). This clearly implicates linear adjacency in the choice of conjunct for participation in CCA; Agree targets ConjP but at the point of agreement spell-out, linear adjacency may favor the closest conjunct.[12]

We would also like to point out two important conclusions that can be drawn from the data in (20) and (21). First, the fact that either conjunct can be implicated in agreement in Hindi and Tsez clearly demonstrates that the relative hierarchical relations between the conjuncts have no bearing on CCA in these languages. Certainly, this could be explained by stipulating that the left conjunct is in a higher position in clauses with left conjunct agreement, and that the right conjunct is in a higher position in clauses with right conjunct agreement, but to do so would

[12] There may be semantic, pragmatic, prosodic or some other differences between the agreement with the entire Boolean phrase and the closest conjunct. They call for further investigation, and at this point we simply assume that they may be present but are not clear.

mean that the structure of ConjP would not be uniform and, instead, would depend on the position of the ConjP in the clause. Furthermore, such a stipulation would run afoul of the actual language facts which show that the leftmost conjunct is always structurally prominent, regardless of its position vis-à-vis the verb. Second, a clausal analysis for CCA in these languages would be impossible because if it turns out that the order in (21)—where the verb precedes ConjP—is derived by scrambling of ConjP (as seems plausible), the latter must be phrasal for movement to take place.[13]

The adjacency analysis is also able to deal with the mixed agreement facts that Lorimor (2007) uncovered in her experimental study of agreement and coordination in Lebanese Arabic. Lorimor used a sentence completion task that prompted the subject to use both a verb and an adjective with a coordinated subject lodged between the two agreeing heads; she found that speakers produced sentences as in (22), where the auxiliary verb agrees with closest conjunct to its right while the adjective agrees with the whole coordination to its left.

(22)	kanit	elbatta	wel	wazzi	xuder
	was.FEM.SG	the.duck.FEM.SG	and	the swan.FEM.SG	green.PL
	'Was the duck and the swan green?'				

[13] These facts in Hindi and Tsez also argue against a gapping analysis for CCA (Aoun et al. 1994) because forward gapping would be required in LCA and backward gapping would be required in FCA. There is no evidence that these languages have both options. Moreover, notice that under the clausal analysis given in Aoun et al. (1994), the verb must undergo across-the-board head movement and the other elements within the VP must undergo right node raising. For such analysis to be extended to both types of CCA in Hindi and Tsez, one would need to posit unmotivated complex movement operations to the left of the verb and to the right of the verb to derive the right results.

It would be difficult to account for such mixed facts under a clausal coordination account but they follow straightforwardly from an adjacency account[14].

Before moving on to our conclusions, we would like to point out that head-final languages with CCA do not always show identical behaviors. One difference between the CCA pattern in Hindi and Tsez reveals that languages may differ in the level of adjacency required for CCA. If anything intervenes between the verb and the leftmost member of the coordinated phrase that follows, FCA is not possible in Tsez.

(23) a. **y**-ik'i-s **kid-no** uži-n (Tsez)
II-went girl.ABS.**II**-and boy.ABS.I-and
'A girl and a boy went.'

b. *y-ik'i-s iduɣor **kid-no** uži-n
II-went home girl.ABS.**II** -and boy.ABS.I-and
'A girl and a boy went home.'

On the other hand, in Hindi strict adjacency with the preverbal absolutive is not required. As shown in (24), intervening material (an adpositional phrase in this example) can separate the verb and the leftmost conjunct, and FCA can still take place.[15]

(24) raam-ne khariid-ii (us dukaan-se) ek saaRii aur kuch kurte (Hindi)
Ram-ERG buy-PERF.FEM.SG that shop-from a saree.ABS.FEM.SG and few kurta.ABS.MASC.PL
'Ram bought (from that shop) a saree and a few kurtas.'

[14] Under a clausal account, one would have to posit right node raising for the adjective, a movement that has no independent motivation in Arabic and that is not generally attested in the language. In fact, mixed agreement is also a problem for the purely Agree-based account of CCA because it is not clear why a goal would target only one conjunct but another goal would target both conjuncts.

[15] However, CCA become less and less likely as more material intervenes. We also find speaker variation in this domain, with some speakers not allowing any intervening material at all, just as in Tsez.

A similar situation obtains in the context of LCA, when the verb follows the coordinated phrase. In Tsez LCA is not possible if another element intervenes between the verb and the coordinated phrase (25), while Hindi seems to tolerate some amount of intervening material (26).

(25) a. uži-n **kid-no** **y**-ik'is (Tsez)
boy.ABS.I-and girl.ABS.**II**-and **II**-went
'A boy and a girl went.'

b. *uži-n **kid-no** iduɣor y-ik'is
boy.ABS.I-and girl.ABS.**II**-and home **II**-went
('A boy and a girl went home.')

(26) raam-ne kuch kurte aur ek saaRii (us dukaan-se) khariid-ii (Hindi)
Ram-ERG few kurta.ABS.MASC.PL and a saree.ABS.FEM.SG that shop-from buy-PERF.FEM.SG
'Ram bought a saree and a few kurtas (from that shop).'

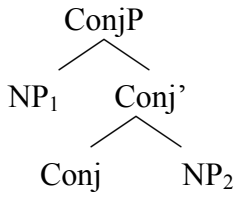
Thus, Tsez presents a case where stricter adjacency is required between two agreeing elements while Hindi does not impose such a strict adjacency condition, though CCA in Hindi is less preferable than full agreement when material intervenes between the verb and the coordinated phrase.

4. General discussion

4.1. Compositionality of agreement. Based on asymmetric coordination in head-initial languages, one could expect that the structure of coordination in head-final languages would be a mirror image of the head-initial coordination, viz., that the rightmost conjunct would dominate the leftmost one. We showed that this assumption is not true: based on the evidence from binding and extraposition, the leftmost conjunct asymmetrically dominates the rightmost one in Hindi

and Tsez:

(27)



Given this structure, which is similar to what is found in head-initial languages, and given the sensitivity of CCA to surface linear order, CCA cannot be accounted for by an asymmetry in the coordinate structure. We have offered a new analysis of CCA, based on linear adjacency condition.

Our analysis belongs to a particular view of agreement approaches, namely the compositional approach to agreement (cf. Haskell and MacDonald 2005, Franck et al. 2002, 2006, 2007, Benmamoun and Lorimor 2006, Bhatia and Benmamoun 2009). Thus agreement takes place in two steps: first in the syntax and then in the PF. The data in Hindi and Tsez both support the compositional approach to agreement. For CCA, we propose that first the agreement relationship between V/T and the coordinated phrase is established in the syntactic component. Then, this relationship is satisfied post-syntactically (in the PF) by spelling out the features of either the whole coordinated phrase or the linearly closest conjunct within this coordinate structure. Thus in our analysis, syntactic relation "Agree" is crucial just like many previous analyses, but the syntactic configuration involving asymmetric coordination is not for CCA; instead an additional condition of linear adjacency/proximity applies at PF resulting in CCA.

This analysis is more uniform, not just across different constructions (left conjunct agreement constructions and right conjunct agreement constructions) but also across language types (head-initial and head-final languages).

The possibility of choosing one conjunct for spell-out may be limited by language processing constraints (such as a lot vs. minimal intervening material for CCA in Hindi) as well as the strictness of the condition of linear adjacency/proximity in individual languages: for example, Tsez requires strict linear adjacency for CCA, whereas linear proximity is sufficient in Hindi. Finally, there are some initial indications that the choice of CCA is sensitive to prosodic constraints (Benmamoun and Lorimor 2006), which require further study. Despite these outstanding issues, the data examined here add to the growing body of evidence in support of the compositional view of agreement.

4.2. Tracking the head parameter.

A question that arises at this point is why a language, such as Moroccan Arabic, does not have CCA with the rightmost conjunct when the ConjP precedes the verb (i.e. in the SV order) as illustrated in (28).

(28) a. *ʕomar w Kariim ža (Moroccan Arabic)

Omar and Karim came.III.MASC.SG

b. ʕomar w Kariim žaw

Omar and Karim came.III.PL

'Omar and Karim came.'

In Moroccan Arabic, CCA only obtains with the leftmost conjunct when ConjP is to the right of the verb, i.e., in the VS order. We do not have a complete answer to this question at present but we would like to offer two considerations. First, it could be that in Arabic, the restriction is that the agreeing head re-brackets only with the elements to the right, probably due to the fact that it is a head-initial language and the VS order is unmarked. This is certainly the case in the nominal

system as well in the context of the so-called Semitic Construct State where the head noun on the left merges with the NP to its right (Borer 1989, Benmamoun 2000).

Second, it appears that in the context of CCA, the most widespread pattern is the one that tracks the head parameter in the language while the other pattern is rare and therefore marked. Therefore, we should expect some languages, such as Moroccan Arabic or Lebanese Arabic, to show only one pattern, which is indeed the attested case. The implication then is that there should be no languages that only have CCA in a pattern that does not track the head parameter of the language. We are aware of no such language but this has to be further confirmed by a more extensive cross-linguistic study which is beyond the scope of this paper.

4.3. The special status of PF. The general conception that PF may be the component where the phenomenon of CCA happens is not far-fetched. Linear proximity and adjacency are notions that use PF vocabulary rather than syntax vocabulary. Therefore, if linear adjacency is involved in CCA, the phenomenon is likely to belong in the PF component. Also, there is a growing literature that suggests that, though agreement may take place in the syntax, the way the features are spelled-out may not be "faithful" to the syntactic component. For example, features may get altered (for instance, through impoverishment) as discussed by Noyer (1992), or a feature maybe absent (as is the case with the number feature in the VSO order in Arabic—Benmamoun 2000). CCA seems to be of the same type—a somewhat impoverished agreement relation that takes place under adjacency with one single conjunct. There are also echoes of this idea in constraint-based approaches where pressures from one constraint may yield an output that violates a faithfulness constraint, cf. Badecker (2007). For example, French has one form for the masculine demonstrative singular and one for the feminine demonstrative singular, yet the feminine form

may appear in (concord) contexts where the masculine is expected (Perlmutter 1998). Syntax has and should have no say in this but PF seems to be the appropriate domain to account for the "unfaithful" choice of the demonstrative[16]. CCA in head-initial and head-final languages may be another instantiation of the role played by PF constraints or primitives.

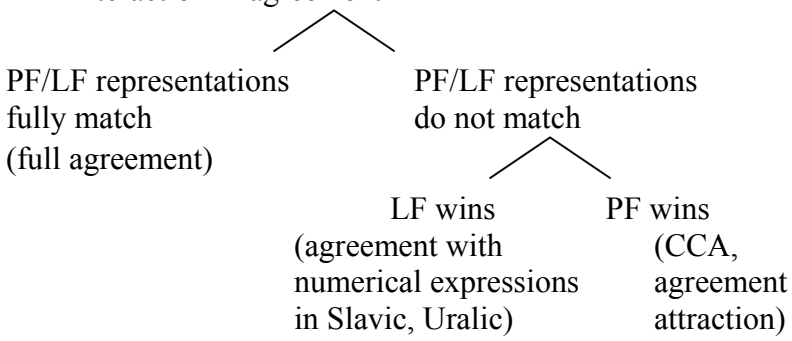
5. Conclusions

Using CCA data from two head-final languages with flexible word order at the root clause level, Hindi and Tsez, we have shown that the previous accounts of CCA, such as Johannessen (1993, 1996, 1998), Munn (1993, 1999, 2000), cannot account for CCA in head-final languages. We have shown that an analysis of CCA based solely on the asymmetry in the structure of coordination cannot explain CCA in Hindi and Tsez since both languages show left conjunct agreement and right conjunct agreement. The two types of agreement are available based on surface word order: if the verb follows the coordinate structure, right/last conjunct agreement takes place, if the verb precedes, left conjunct agreement is available. We have used this agreement pattern to argue for the compositional view of agreement, under which agreement is determined at the syntactic level and at PF; if the two levels yield matching results, there is no variation. If the syntactic level wins over, one observes agreement based on the underlying representation, which is particularly apparent in cases of numerical expressions whose surface forms do not always show the necessary [+plural] feature (Ionin and Matushansky 2004, 2006; Xiang et al. 2008, 2009). CCA, which we have been concerned with in this paper, is an instance of PF superceding the syntactic representation.

We conclude with the following typology of the interaction between syntax and PF:

[16] In Optimality Theoretic terms, this is a case of a phonological constraint outranking a syntactic constraint (Perlmutter 1998).

(29) PF—LF interaction in agreement



Under this typology, the absence of CCA in the context of number sensitive items is an instance of LF superceding PF. To refresh the readers' memory, clausal coordination analysis was proposed to explain the unavailability of CCA with number sensitive items in languages such as Moroccan Arabic and Lebanese Arabic. We hypothesize that number sensitive items in languages such as Moroccan Arabic force certain requirements on LF resulting in full agreement only. In other languages, on the other hand, number sensitive items do not impose such demands on LF which allows CCA in the context of number sensitive items.

Future cross-linguistic work will be able to put this tentative typology to test. In the interim, the obvious conclusion is that agreement in general and even PF-induced agreement in particular does not have to have a uniform explanation, and for the available cases of agreement "violations" it is important to examine their motivation.

Abbreviations

ABS—absolutive, DAT—dative, ERG—ergative, FEM—feminine, FUT—future, GEN—Genitive, MASC—masculine, PERF—perfective, PL—plural, SG—singular.

References

Aoun, Joseph, Elabbas Benmamoun and Dominique Sportiche. 1994. "Agreement and conjunction in some varieties of Arabic". *Linguistic Inquiry 25*, 195-220.

Aoun, Joseph, Elabbas Benmamoun and Dominique Sportiche. 1999. "Further remarks on first conjunct agreement". *Linguistic Inquiry 30*, 669-681.

Babyonyshev, Maria A. 1996. *Structural connections in syntax and processing: studies in Russian and Japanese*. Ph.D. dissertation, MIT.

Badecker, William. 2007. "A feature principle for partial agreement". *Lingua 117*, 1541-1565.

Benmamoun, Elabbas. 1992. *Functional and inflectional morphology: Problems of projection, representation, and derivation*. Ph.D. dissertation, USC.

Benmamoun, Elabbas. 2000. "Agreement asymmetries and the PF Interface". *Research in Afroasiatic Grammar,* ed. by Jacqueline Lecarme, Jean Lowenstamm and Ur Shlonsky, 23-40. The Hague: Holland Academic Graphics.

Benmamoun, Elabbas and Archna Bhatia. 2009. "The structure of coordination and close conjunct agreement". Ms., University of Illinois.

Benmamoun, Elabbas and Heidi Lorimor. 2006. "Featureless expressions: When morphophonological markers are absent". *Linguistic Inquiry 37*, 1-23.

Bhatia, Archna and Elabbas Benmamoun. 2009. "Close conjunct agreement: Role of linear adjacency". Paper presented at the 2009 Annual Meeting of the LSA.

Borer, Hagit. 1989. "On the morphological parallelism between compounds and construct state nominals". *The Morphology Yearbook I*, ed. by G. Booij and J. van Marle, 45-65. Dordrecht: Foris Publications.

Bošković, Zeljko. 2009. "Unifying first and last conjunct agreement." Ms., U of Connecticut. http://web2.uconn.edu/boskovic/papers/conjunctagreement2.pdf

Corbett, Greville. 1990. *Gender*. Cambridge: Cambridge University Press.

Franck, Julie, Gabriella Vigliocco and Janet Nicol. 2002. "Subject-verb agreement errors in

French and English: The role of syntactic hierarchy". *Language and Cognitive Processes 17*, 371-404.

Franck, Julie, Glenda Lassi, Ulrich H. Frauenfelder, and Luigi Rizzi. 2006. "Agreement and movement: A syntactic analysis of attraction". *Cognition 101*, 173-216.

Franck, Julie, Ulrich H. Frauenfelder, and Luigi Rizzi. 2007. "A syntactic analysis of interference in subject-verb agreement". *MIT Working Papers in Linguistics 53*. 173-190.

Haskell, Todd and Maryellen MacDonald. 2005. "Constituent structure and linear order in language production: Evidence from subject-verb agreement". *Journal of Experimental Psychology: Learning, Memory, and Cognition 31*, 891-904.

Ionin, Tania and Ora Matushansky. 2004. "A singular plural". *Proceedings of WCCFL 23*, ed. by B. Schmeiser, V. Chand, A. Kelleher and A. Rodriguez, 399-412. Stanford: CSLI.

Ionin, Tania and Ora Matushansky. 2006. "The composition of complex cardinals". *Journal of Semantics 23/4*, 315-360.

Johannessen, Janne Bondi. 1993. *Coordination. A Minimalist approach*. Ph.D. dissertation, University of Oslo.

Johannessen, Janne Bondi. 1996. "Partial agreement and coordination". *Linguistic Inquiry 27:4*, 661-676.

Johannessen, Janne Bondi. 1998. *Coordination*. Oxford: Oxford University Press.

Kachru, Yamuna. 1980. *Aspects of Hindi grammar*. New Delhi: Manohar Publications.

Koopman, Hilda and Dominique Sportiche. 1991. "The position of subjects". *Lingua* 85, 211-258.

Lorimor, Heidi. 2007. *Conjunctions and grammatical agreement*. Ph.D. dissertation, University of Illinois.

Marušič, Franc, Andrew Nevins and Amanda Saksida. 2007. "Linear agreement in Slovene

conjuncts". *Formal Approaches to Slavic Linguistics 15 (The Toronto Meeting),* ed. by Richard Compton, Magdalena Goledzinowska, and Ulyana Savchenko, 210-227. Ann Arbor: Michigan Slavic Publications.

Munn, Alan. 1993. *Topics in the syntax and semantics of coordinate structures*. Ph.D. dissertation, University of Maryland.

Munn, Alan. 1999. "First conjunct agreement: Against a clausal analysis". *Linguistic Inquiry 30:4*, 643- 668.

Munn, Alan. 2000. "Three types of coordination asymmetries". *Ellipsis in conjunction,* ed. by Kerstin Schwabe and Nung Zhang, 1-22. Tübingen: Max Niemeyer Verlag.

Noyer, Rolf. 1992. *Features, positions, and affixes in autonomous morphological structure*. PhD dissertation, MIT.

Perlmutter, David M. 1998. "Interfaces: Explanation of allomorphy and the architecture of grammars". In *Morphology and its relation to phonology and syntax,* ed. by Steven G. Lapointe, Diane G. Brentari, and Patrick M. Farrell, 307-359. Stanford, CA: Center for the Study of Language & Information.

Polinsky, Maria and Bernard Comrie. 1999. "Agreement in Tsez". *Folia Linguistica 33*, 109-130.

Polinsky, Maria and Eric Potsdam. 2002. "Backward control". *Linguistic Inquiry 33*, 245-282.

Soltan, Usama. 2006. "Standard Arabic subject-verb agreement asymmetry revisited in an Agree-based minimalist syntax". *Agreement systems,* ed. by Cedric Boeckx, 239-265. Amsterdam: John Benjamins.

van Koppen, Marjo. 2007. "Agreement with coordinated subjects: A comparative perspective". *Linguistic Variation Yearbook 7*, 121-161.

Xiang, Ming, Boris Harizanov, and Maria Polinsky. 2008. *Processing grammatical and semantic number in Russian*. Poster presented at CUNY Conference on Human Sentence Processing, University of North Carolina at Chapel Hill.

Xiang, Ming, Boris Harizanov, Maria Polinsky, and Ekaterina Kravtchenko. 2009. From surface form to mental representation: A processing investigation of Russian numerical phrases. Ms., Harvard University.