

Closest conjunct agreement in head final languages*

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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 when the verb follows the conjoined phrase. This contrasts with head-initial languages, such as Arabic, where close conjunct agreement is with the leftmost conjunct in clauses with VS order. In addition, both languages exhibit certain flexibility of word order at root clause level; when the verb precedes the conjoined phrase, it can also agree with the leftmost conjunct. The empirical data from the two languages raise the following questions. 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 proximity in closest conjunct agreement? These questions have wider implications for the analysis of agreement and the relation between syntax and the morpho-phonological component.

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

1. Closest conjunct agreement

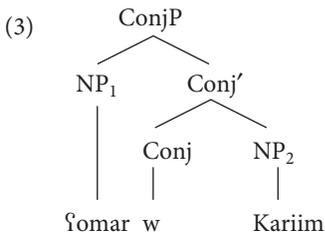
In languages such as Moroccan Arabic or Lebanese Arabic, there are two patterns of agreement in the context of coordination. In clauses with SV order the verb must agree with both conjuncts (full agreement):

- (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), instantiating closest conjunct agreement (CCA), or with both conjuncts (2b), instantiating full agreement:

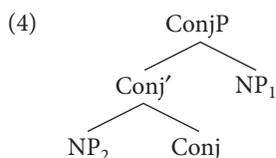
- (2) a. *ža* *ʕomar w Kariim* (Moroccan Arabic)
 came.III.MASC.SG Omar and Karim
 ‘Omar and Karim came.’
- b. *żaw* *ʕomar w Kariim*
 came.III.PL Omar and Karim
 ‘Omar and Karim came.’

Most current accounts (Munn 2000; Soltan 2006; van Koppen 2007; Marušić et al. 2007; Bošković 2009) assume that CCA arises in the context of phrasal coordination (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 asymmetric, with prominence in head-initial languages given to the leftmost conjunct, 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 proposed in earlier accounts, e.g., Benmamoun 1992). 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.

Assuming these analyses are on the right track, the prediction is that in head-final languages, where the verb follows conjoined DPs, CCA if available, should be with the rightmost conjunct. This is related to the assumption that the structure of coordination should be the mirror image of the structure of coordination in head-initial languages; the latter assumption is spelled out by Johannessen (1996), who proposes an asymmetric coordinate structure with the right-hand specifier:



In this paper, we will present and analyze data from two unrelated head-final languages, Hindi and Tsez. We will show that the predictions outlined above are only partially confirmed: CCA is indeed with the right-hand conjunct, but that is not the only option, and the structure of coordination is different from what is shown in (4). Our ultimate conclusion is that CCA is sensitive not only to hierarchical structural relations but also to linear proximity; taken together, these observations call for a compositional model of agreement.

The paper is structured as follows: Section 2 presents the relevant data from Hindi and Tsez. Section 3 addresses linear proximity and adjacency in agreement; we hypothesize that both strict adjacency and linear proximity are manifestations of the same phenomenon indicative of surface effects in agreement. Section 4 presents our proposals concerning compositionality of agreement and the interaction of syntactic effects with PF. Section 5 is a summary of our conclusions and outstanding questions raised by the new patterns of CCA.

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 intriguing similarities with respect to CCA (there are some differences as well, which we will discuss below). 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.¹

In Hindi, verbs and auxiliaries agree with the absolutive DP. All aspect markers (affixes or separate auxiliaries) and the past tense auxiliary agree with the absolutive in number and gender, but not person (5a). The present tense auxiliary agrees

with the absolutive/nominative DP in number and person, but not gender (5b), while the future tense auxiliary agrees in number, gender and person features (5c).

- (5) a. maiN/tuu/veh jaa-taa thaa (Hindi)
 I/you/he go-HAB.MASC.SG PAST.MASC.SG
 'I(male)/you(male)/he used to go.'
- b. maiN jaa-taa huuN
 I go-HAB.MASC.SG PRES.1SG
 'I (male) go.'
- c. maiN vahaaN huuN-gii/*huuN-gaa
 I there PRES.1SG-FEM.SG.FUT/*MASC.SG.FUT
 'I (female) will be there.'

In Tsez, the ergative alignment is independent of tense and aspect, and verbs/participles as well as auxiliaries show agreement with the absolutive argument. The agreement is in gender (noun class) and number,² with four genders in the singular and two in the plural:

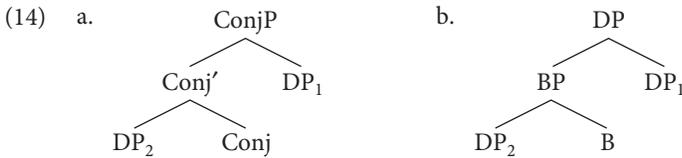
- (6) Gender agreement prefixes in Tsez
- | | | | |
|-----|----|---|----|
| | sg | | pl |
| I | ∅- | | b- |
| II | y- | } | r- |
| III | b- | | |
| IV | r- | | |

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

- (7) a. kid y-ays (Tsez)
 girl.ABS.II II-came
 'The girl came.'
- b. uʒ-ā kid y-egirsi
 boy-ERG girl.ABS.II II-sent
 'The boy sent the girl.'

Neither language allows agreement with arguments or constituents of arguments in any other case; this means that agreement with the possessor or agreement with a PP, familiar from the cases of agreement attraction in English (e.g., Bock et al. 1999), as in (8a, b) is impossible; in (9), the verb has to agree with the absolutive 'brother' but not with the genitive 'girl's', and in (10) the only possible agreement is with the absolutive argument 'rooster' but not with the possessor in the genitive case:

In short, Hindi and Tsez display CCA with the rightmost conjunct. This is as predicted if coordination has an asymmetric structure, as in (14), with the rightmost conjunct being the most prominent structurally and thus accessible under Agree. The structure shown in (14a) follows Johannessen's proposal (1996) in which it is assumed that the features of the highest conjunct (the conjunct in the specifier position) can percolate up to the ConjP and thus V/T can show agreement features of the highest conjunct (the last conjunct), which accounts for CCA with the last conjunct. The structure in (14b) is based on Munn (2000), who assumes an adjunction structure of coordination where a conjunct (DP₂) is part of a Boolean Phrase with the head B (conjunction), and this phrase is then adjoined to the other conjunct (DP₁).



Under a Boolean Phrase approach, for head-final languages, the BP-adjunction takes place to the left as in (14b). 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.

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.

3. Agree and adjacency/proximity

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 such as Arabic.

Let us now consider the design of coordination in head-final languages such as Hindi or 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) rather than

the structure in (4). 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
 every man_i.MASC.SG and he_i-of dog.MASC.SG
 bazaar ga-yaa (Hindi)
 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. **kid-bā halmay-no** nesā nesis eniw-no b-ayersi (Tsez)
 girl-ERG friend.ABS-and self.GEN mother.ABS-and IPL-brought
 ‘The girl brought her (male) friend and his mother.’
- b. ***kid-bā nesā nesis eniw-no** halmay-no b-ayersi
 girl-ERG self.GEN mother.ABS-and friend.ABS-and IPL-brought

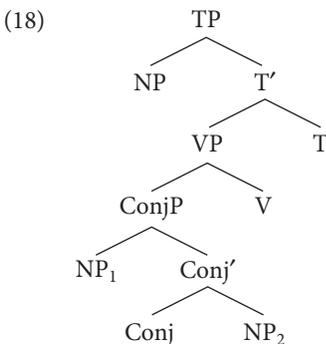
In (15a) and (16a) the leftmost QP conjunct binds the bound pronoun in the second conjunct. Under the standard assumptions of syntactic analyses of binding, this implies that the leftmost conjunct c-commands the rightmost conjunct—i.e., the first conjunct is structurally more prominent than the second conjunct. This is not expected if the structure of coordination in Hindi and Tsez is as in (4), but it is exactly what should be expected if the structure of coordination is as in (3).⁴

Another argument discussed in Benmamoun and Bhatia (2009) and based on similar data from English discussed in Munn (1999) comes from extraposition.⁵ Consider the Hindi sentences in (17).

- (17) a. John-ne kal **ek kitaab** aur **ek**
 John-ERG yesterday one book.FEM.SG and one
mægziin khariid-ii (Hindi)
magazine.FEM.SG buy-PERF.FEM.SG
 ‘Yesterday John bought a book and a magazine.’
- b. John-ne kal **ek kitaab** t_i khariidii, [**aur ek mægziin**]_i
 ‘Yesterday John bought a book, and a magazine.’
- c. *John-ne kal 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_i khariidii, [**ek mægziin**]
 (‘Yesterday John bought a book and a magazine.’)

In (17b) the coordination conjunction *aur* and the rightmost conjunct can be extraposed to the right of the verb.⁶ 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. Note that *aur* is a free standing word—it can be used to request an elaboration to a list (*aur?* ‘and?’ or *aur kaun?* ‘and who (else)?’). If *aur* were a clitic, the data in (17b–d) could have been accounted for as the movement of part of the object rather than the entire object (cf. Bošković 2009 for partial movement in Serbo-Croatian); however, such an analysis is incompatible with the categorial status of *aur*.

In summary, 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 (3) 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, where the verb agrees with the absolutive object within the VP (ConjP).⁷



In (18), T c-commands ConjP and NP₁. Under all of the previous analyses mentioned above, if there is CCA in Hindi we should expect to find it with NP₁ rather than NP₂ because NP₁ is in a closer Agree relation with T(+V) than NP₂; however,

we find CCA with NP₂ rather than with NP₁. Specifically, we show below that V/T in Hindi and Tsez can agree with the first as well as last conjunct depending on whether the ConjP appears postverbally or preverbally. It is therefore clear that NP₁ is active (and thus capable 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 NP₁ are visible and accessible.⁸

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 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 NP₂ 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. 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 in terms of a particular feature. Crucially, contra recent proposals that have tried to develop syntactic mechanisms to single out one conjunct for agreement in the syntactic component we do not assume that Agree takes place with the structurally closest conjunct but rather with the whole coordinated phrase.⁹ The agreement relationship established in the syntactic component (through Agree) is subsequently satisfied at PF by the spelling out of the features, and this process may

be affected by the PF condition of linear adjacency or proximity. This conception of double agreement captures the intuition that phi-features have different weight (see this issue explored in detail in Baker 2008) and may play a different role in the final spell-out. For instance, gender but not number is an inherent feature of nouns (see Aoun et al. 1994, 1999; Baker 2008), which allows it to be accessible as the default when other phi-features are not specified.

The outstanding issue here, which has to be investigated experimentally, has to do with the actual PF-based relationship between the verb and the adjacent conjunct as expressed prosodically or tonally. The importance of such a relationship has been underscored by several researchers, cf. for example, Ackema and Neeleman (2004), who specifically introduce the notion of prosodic checking in PF for such features as agreement; in their model, prosodic checking requires that the two agreeing elements be in the same prosodic domain (which can be reflected in adjacency).

The prosodic domain under CCA still needs to be determined for the languages considered here (as well as the other CCA languages discussed in the literature). If it turns out that there is a prosodic relation between the two elements that would strengthen our conception of attributing CCA to spell-out at PF because we expect that component to be sensitive to such relations. Note that in languages such as Hindi and Tsez, where CCA obtains in both orders, preverbally and postverbally, it remains to be determined whether the verb forms a prosodic unit with a conjunct both when it precedes it and when it follows it. This remains an open question that can only be answered by studying the prosody of coordination, agreement, and word order in these languages.

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. However, ergative subjects in Hindi only appear in the perfective; if the verb is non-perfective, as in (19b), the subject appears in the unmarked (absolutive/nominative) form. Thus, in (19b), the subject *raam* is the highest absolutive argument, and thus agreement can only take place with it, even if the object is clearly more adjacent to the verb—the object in this non-perfective 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 a chair.’

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

The role of adjacency or close proximity is more apparent in Hindi and Tsez than in Arabic, which we considered in the beginning of the paper. 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: [_{ConjP} DP₁ & DP₂] 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
 I-ERG an umbrella.ABS.MASC.SG and a saaree.ABS.FEM.SG
 khariid-ii (Hindi)
 buy-PERF.FEM.SG
 'I bought an umbrella and a saree.' (Kachru 1980: 147)

Pattern II: First Conjunct Agreement with following ConjP: V [_{ConjP} DP₁ & DP₂]

- (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
 Ram-ERG what.MASC.SG buy-PERF.MASC.SG he-ERG buy-PERF FEM.SG
 kursii aur sofa, jo us-e ham-ne manaa
 chair.ABS.FSG and sofa.ABS.MSG which he-DAT we-ERG forbid
 ki-yaa thaa (Hindi)
 do-PERF.MASC.SG PAST.MASC.SG
 '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.¹⁰

On the other hand, in Hindi strict adjacency with the preverbal absolutive is not required—instead, it seems that close proximity is sufficient for CCA. As shown in (24) and (26a), intervening material (an adpositional phrase in this example) can separate the verb and the leftmost conjunct, and FCA can still take place.¹³

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

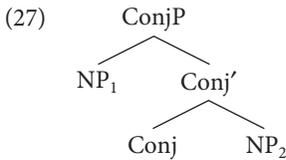
A similar situation obtains in the context of LCA, when the verb follows the coordinated phrase. In Tsez LCA is not possible if another element intervenes between the verb and the coordinated phrase (25b), while Hindi seems to tolerate intervening material (26a). If any generalization concerning the intervening material in Hindi may be possible at this stage, it has to do with the weight of the intervener, but not with any of its grammatical properties: in (26a), the intervener is a short adjunct, and CCA is possible, but in (26b), the intervener is much longer and CCA is blocked. The sensitivity to the weight of the intervening material is a sign of a processing rather than grammatical effect—assuming this is the case, the interaction between CCA and intervention in Hindi should be tested experimentally.¹⁴

- (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 iduyor y-ik’is
 boy.ABS.I-and girl.ABS.II-and home II-went
 (‘A boy and a girl went home.’)
- (26) a. raam-ne kuch kurte aur ek saaRii
 Ram-ERG few kurta.ABS.MASC.PL and a saree.ABS.FEM.SG
 (us dukaan-se) khariid-ii (Hindi)
 (that shop-from) buy-PERF.FEM.SG
 ‘Ram bought a few kurtas and a sari (from that shop).’
 b. raam-ne kuch kurte aur ek saaRii us
 Ram-ERG few kurta.ABS.MASC.PL and a saree.ABS.FEM.SG that
 laRke-ke daadaa-ke dost-kii dukaan-se
 boy-GEN grandfather-GEN friend-GEN shop-from
 khariid-e/*?khariid-ii
 buy-PERF.MASC.PL/*?buy-PERF.FEM.SG
 ‘Ram bought a few kurtas and a sari from that boy’s grandfather’s friend’s shop.’

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:



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 (or close proximity) condition.

Our analysis belongs to a particular view of agreement approaches, namely the compositional approach to agreement (cf. Franck et al. 2002; Ackema & Neeleman 2004; Haskell & MacDonald 2005; Benmamoun & Lorimor 2006; Bhatia & Benmamoun 2009; among others). Agreement is viewed as a process that takes place in two steps: first in the syntax and then in 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 (at PF) by spelling out the features of either the whole coordinated phrase or the features of the linearly closest conjunct within this coordinate structure. The spelling out of different features at PF suggests that the phi-features of the whole conjunct as well as of its constituents may be in competition. This competition can be resolved at PF by appealing to the closer element.

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 much 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 (Ackema & Neeleman 2004; Benmamoun & Lorimor 2006), which require further study.¹⁵ 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.¹⁶ 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).¹⁷

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

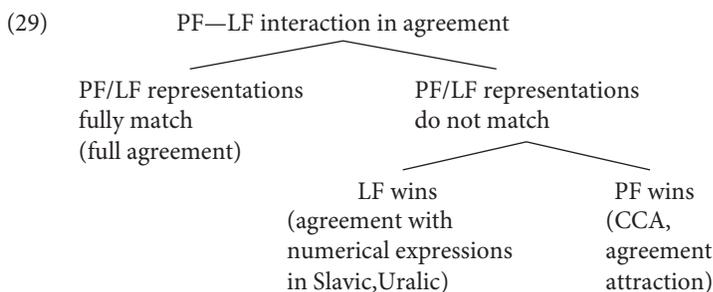
The general conception that PF may be the component where the phenomenon of CCA happens is not far-fetched. Linear proximity and adjacency are notions that use PF vocabulary rather than syntax vocabulary. Therefore, if linear adjacency is involved in CCA, the phenomenon is likely to belong in the PF component (see also Ackema & Neeleman 2004: Ch. 7 For a similar observation). A growing

literature 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 may be 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.¹⁸ CCA in head-initial and head-final languages may be another instantiation of the role played by PF constraints or primitives.

5. Conclusions and outstanding questions

Using CCA data from two 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 (see also van Koppen 2005: Ch. 4 for the same conclusion, which relies on a similar argumentation). 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, and 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 & 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:



Under this typology, the absence of CCA in the context of number sensitive items is an instance of LF superseding PF. A clausal coordination analysis was proposed to explain the unavailability of CCA with number sensitive items in Moroccan and Lebanese Arabic. Thus, CCA is impossible in the context of the collective particle *bžužhum* (30a) or the reciprocal (31a):

- (30) a. *lʕəb ʕomar w kariim bžužhum (Moroccan Arabic)
 play.3MASC.SG Omar and Karim together
- b. ləʕbu ʕomar w kariim bžužhum
 play.3PL Omar and Karim together
 ‘Omar and Karim played together.’
- c. ʕomar w kariim ləʕbu bžužhum
 Omar and Karim play.3PL together
 ‘Omar and Karim played together.’
- (31) a. *gələs ʕomar w kariim hda bəʕDhum
 sat.3MASC.SG Omar and Karim near each other
- b. gələsu ʕomar w kariim hda bəʕDhum
 sat.3PL Omar and Karim near each other
 ‘Omar and Karim sat near each other.’
- c. ʕomar w kariim gələsu hda bəʕDhum
 Omar and Karim sat.3PL near each other
 ‘Omar and Karim sat near each other.’

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 results in CCA in the context of number sensitive items.

As pointed out above, CCA highlights the issue of the relation between syntax and the PF component. Our analysis crucially embraces the view that spell-out of the agreement features may be sensitive to PF effects such as proximity and rebracketing under proximity or adjacency. The mapping from syntax to PF is not

always faithful to the syntactic configuration though departures from isomorphy tend to be local. The debates about sentence and phrasal prosody as well as the discrepancies between sentential and morpho-phonological bracketing have engaged different facts of the relation between the two components.¹⁹ Our analysis advances the thesis that rebracketing in PF has morphological consequences; in this instance it determines which conjunct determines the spell-out of agreement features on the target. The next critical task for us and for all the analyses that espouse such a significant role for PF is to undertake in-depth research on prosodic phrasing and word order in the language in order to adequately determine their role in accounting for facts that used to be relegated to core syntax.²⁰ Such research also has the potential to isolate language specific properties that could help account for the differences in how languages determine domains where adjacency effects on phenomena such as agreement are manifested, somewhat similar to research on domains for vowel harmony and stress.

Abbreviations

ABS	absolutive	HAB	habitual
DAT	dative	MASC	masculine
ERG	ergative	OBL	oblique
FEM	feminine	PERF	perfective
FUT	future	PL	plural
GEN	Genitive	SG	singular

Notes

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1. 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.
2. Tsez agreement, which is prefixal, is only visible on a subset of vowel-initial verbs; it is blocked if the verb has an underlying initial laryngeal (see Polinsky & Comrie 1999 for details).

3. Gender resolution in both languages follows the so-called virile rule (Corbett 1990). In Hindi, gender resolution of a MASC feature and a 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.
4. The issue is complicated by the fact that linear precedence may also have an effect. Indeed, in Hindi, scrambling is known to affect binding (Kidwai 2000: 83–137), and although (15b) is undoubtedly ungrammatical, it is impossible to rule out the effect of linearity (we are grateful to an anonymous reviewer for bringing this consideration to our attention). In Tsez, scrambling does not interfere with binding, so one could be more certain that the ungrammaticality of (16b) is due to structural asymmetry between the conjuncts.
5. 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.
6. Since in Tsez the coordination particle attaches to each conjunct, such a test is simply impossible.
7. 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.
8. 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.
9. In our view, this should be the null hypothesis because the entire conjunct is targeted by relations that are sensitive to the syntactic configuration such as movement and anaphoric dependencies.
10. 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.
11. Somewhat similar facts obtain in Slovene and Serbo-Croatian as discussed in Marušič et al. (2008) and Bošković (2009). However, in Slovene, for example, rightmost conjunct agreement is more prevalent with the gender feature, which, as we mentioned above, may be privileged due to its inherent nature (it is associated with the noun in the lexicon).
12. 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 one goal would target only one conjunct but another goal would target both conjuncts.
13. 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.

14. At this stage, we are not aware of any experimental work on the weight of interveners; we leave this question for further study.
15. Languages differ as to whether intervening elements can disrupt the agreement relation which raises the question as to the structure of the prosodic units in question. See Ackema and Neeleman (2004) and van Koppen (2005, Ch. 4) for a discussion of this issue in the context of complementizer agreement in Dutch.
16. Benmamoun (2000) discusses agreement between nouns and proximate demonstratives which also display an agreement asymmetry. The proximate demonstrative does not show agreement when it precedes the noun but it does when it follows it. Benmamoun (2000) attributes the absence of the agreement when the demonstrative precedes the noun to a prosodic relation between them which is absent when the noun precedes the demonstratives. Overall, it seems that there is a strong tendency for the agreement affix to be absent or to realize agreement with the first conjunct when the head precedes the agreement controller in Arabic.
17. Relevant here is the debate about the SVO order in Arabic, namely whether the preverbal subject is a genuine subject or a topic/left-dislocated element that binds a resumptive pronoun. According to Soltan (2006) in the SVO in the context of coordination, the two conjuncts occupy a peripheral position while a null pronominal occupies the argument position that enters into the agreement relation, hence full/plural agreement.
18. In Optimality Theoretic terms, this is a case of a phonological constraint outranking a syntactic constraint (Perlmutter 1998).
19. See Kaisse (1985), Sadock (1985), Nespor and Vogel (1986), Selkirk (1986), Marantz (1988), Inkelas and Zec (1990), Jackendoff (1997), among many others.
20. The same remark applies to recent work on verb movement, dislocation, and scrambling that has argued for a significant role for PF for these phenomena.

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