The Structure of Coordination and Close Conjunct Agreement

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There are strong arguments that conjuncts within the coordination structure are not in a symmetric relation with each other. For example, in head initial languages, such as English, it has been argued that the leftmost conjunct is structurally more prominent than the other conjunct(s). The arguments come from binding, movement (Munn 1993), prosody (Ross 1967, Munn 1993), and close conjunct agreement (henceforth CCA; Johannessen 1993, 1998, Munn 1993, 1999). In this paper, we discuss a paradox that arises in coordination in Hindi, a head final language. Hindi displays CCA but with the rightmost conjunct. On the other hand, binding, movement, and prosody show that the leftmost conjunct is structurally more prominent. We will argue: (i) that Hindi coordination patterns with English coordination in being head initial with the leftmost conjunct structurally more prominent than the rightmost conjunct; and (ii) that CCA does not argue for the structural prominence of a particular conjunct but rather for the role that linear order plays in agreement.

The short paper is organized as follows. In section 1, we consider the Hindi data with respect to the arguments for the asymmetric structure of coordination and show that Hindi has a head initial (asymmetric) structure of coordination. It turns out that the

coordination phrase is not the only head initial phrase in Hindi, it was pointed out to us that the CP/ForceP *'ki'*, demonstrative phrase *'yeh/vo'*, conditionals *'agar'*, "because" phrase *'kyuNki'*, etc also are head initial, despite the fact that phrases such as Noun Phrase, Adpositional Phrase and Verb Phrase are indeed head final.[1] In section 2, we discuss analyses of CCA, particularly the analyses of Munn (1993, 1999) and Johannessen (1993, 1998) that rely on the asymmetric structure of coordination and particularly the structural prominence of the leftmost conjunct (in head initial structures) to derive CCA. We show that the Hindi CCA facts challenge those analyses. In section 3, we suggest an alternative analysis for CCA which gives more importance to the linear proximity and discuss the implications that arise for current analyses of agreement.

1. Head Initial Asymmetric Structure of Coordination in Hindi

Coordination is argued to have an asymmetric structure (Kayne 1994) as opposed to a flat structure (1). An asymmetric structure for coordination is where one of the conjuncts is structurally more prominent than the other and thus can enter into asymmetric relations with it. Two of the representative asymmetric structures for coordination in the literature are proposed in Munn 1993, 1999 and Johannessen 1993, 1998.[2] The difference between these two structures relates to whether the conjunction particle and the second conjunct form a maximal projection that is adjoined to the first conjunct as proposed by Munn

1 See Davison (2006) for initial complementizers in Hindi. She also points out that languages with relative pronouns also have initial conjunctions (Hindi has relative pronouns). Bhatt (1996) uses a head initial structure for demonstratives.

2 Actually, Munn (1987, 1992) posits a different structure from Munn (1993, 1999), which is similar to the structure adopted by Johannessen.

(1993) and illustrated in (2) or whether they are in a head complement relation with the first conjunct as specifier (e.g., Johannessen 1993, 1998) as shown in (3). The structures given in (2) and (3), with leftmost conjunct in a structurally more prominent position than the other conjunct, represent the head initial languages; in head final structures, the rightmost conjunct would be in a structurally prominent position.

(1) **"flat structure" :** $[_{XP}$ XP and XP]

(2) "**BP structure" :** $[_{DP1}$ DP_1 $[_{BP}$ B $DP_2]]$

(3) **"Spec-head structure" :** $[_{CoP[X]}$ X $[_{Co'}$ Co Y]]

A number of arguments have been advanced to support the asymmetric structure of coordination. The evidence comes mainly from Binding, extraposition (Munn 1993), and prosody (Ross 1967, Munn 1993).[3] Below we consider Hindi coordination with respect to these arguments and demonstrate that it has a head initial asymmetric structure.[4]

1.1. Binding

The strongest evidence, according to Munn (1993), in favor of the asymmetric structure of coordination comes from binding. As shown in (4a), the left-most quantificational phrase (QP) conjunct binds the bound pronoun in the second conjunct, but the QP in the second conjunct in (4b) does not bind the bound pronoun in the first conjunct. This

3 Barss & Lasnik (1986) also suggest binding as a test for asymmetric relation in general. Additional arguments come from cliticization (see Ross 1967, Munn 1993) and unlike category coordination (see Munn 1993, Johannessen 1996, 1998 for discussion) etc. However, these additional tests are not relevant for Hindi, e.g. the conjunction head never cliticizes in Hindi; and both the conjuncts always show the same Case.

4 The data have been surveyed with a few native Hindi speakers (most of them originally from Delhi), and also we searched a corpus (Dainik Jagaran) and have found examples there as well.

indicates that first conjunct is syntactically more prominent than the second in Hindi too.

(4) a. **har aadmii$_i$** aur **us$_i$**-kaa kuttaa bazaar gayaa

every man and his dog market went

'Every man and his dog went to the market.'

b. * **us$_i$**-kaa kuttaa aur **har aadmii$_i$** bazaar gayaa

Since binding is assumed to involve the c-command relationship, the binding facts in (4) are consistent with the structures of coordination in (2) and (3), where the first conjunct asysmmetrically c-commands the second conjunct.[5]

1.2. Extraposition

Munn (1993) shows that in the head initial languages such as English, the second conjunct can extrapose together with the conjunction particle but the first conjunct may not. Thus, the second conjunct and conjunction particle constitute a maximal projection under the assumption that only maximal projections can undergo displacement. The same facts obtain in Hindi as shown in (5).[6]

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5 To show that the binding facts in (4) are not a result of a violation of the Leftness Condition (Chomsky 1973) as stated in (i), Munn (1993) provides further evidence using R-expressions which can be coreferential with the pronouns when in the first conjunct but not when they are in the second conjunct. We find the same situation in Hindi too as illustrated in (ii).

(i) Leftness Condition: A pronoun may not be interpreted as a bound variable of a quantifier when it is to the quantifier's left.

(ii) a. **John$_i$**-kaa kuttaa aur **vo$_i$** bazaar gaye

John's dog and he market went

'John's dog and he went to the market.'

b. * **vo$_i$** aur **John$_i$**-kaa kuttaa bazaar gaye

6 It was pointed out to us that the fact that extraposition of the second conjunct is blocked when the whole coordinated phrase is marked with Case/FOC/TOP may argue against the BP-structure analysis, and that this observation may, in fact, be due to the spec-head structure of coordination. However, we suggest that this may be due to the fact that the Case/FOC/TOP particle attaches to the entire coordinated phrase, so the coordinated phrase forms a prosodic unit that cannot be broken (a case of

(5) a. John-ne kal **ek kitaab aur ek magazine** khariidi

John yesterday **one book and one magazine** bought

'Yesterday John bought a book and a magazine.'

b. John-ne kal **ek kitaab t** khariidii, **[aur ek magazine]**

'Yesterday John bought a book , and a magazine.'

c. * John-ne kal **t ek magazine** khariidii, **[ek kitaab aur]**

'Yesterday John bought a magazine, a book and.'

d. * John-ne kal **[ek kitaab aur] t** khariidii, **[ek magazine]**

'Yesterday John bought a book and , a magazine.'

The grammaticality of (5b) shows that the conjunction particle and the second conjunct can undergo movement as a unit and thus form a constituent. The first conjunct together with the conjunction particle do not form a constituent that excludes the rightmost conjunct, as shown by the ungrammaticality of (5c). The ungrammaticality of (5d) shows that the second conjunct cannot be extraposed without the conjunction.

Thus, the movement facts in the context of Hindi coordination suggest that the conjunction particle and the rightmost conjunct form a constituent that can exclude the leftmost conjunct, which is expected under a head initial structure of coordination and is consistent with similar facts from head initial languages.

lexical integrity) by extraposing any element out of it.

1.3. Prosody - Intonational Pauses

As pointed out by Ross (1967), and discussed in Munn (1993), an intonational pause is more natural after the first conjunct than after the conjunction particle, which is again consistent with the (head initial) asymmetric structure of coordination. The following Hindi data in (6a) also shows that an intonational pause can occur after the first conjunct, however, it cannot occur after the first conjunct and the conjunction, treating them as one unit as in (6b). This shows that the second conjunct and the conjunction particle form a constituent, but not the first conjunct and the conjunction particle.

(6) a. [john ga-yaa] . [aur [us-ne bye bhii nahiiN kah-aa]]

John went and he bye also not said

[CONJUNCT-1] PAUSE [CONJUNCTION [CONJUNCT-2]]

'John left, and he didn't even say good-bye.'

b. * [[john ga-yaa] aur] . [us-ne bye bhii nahiiN kah-aa]

[[CONJUNCT-1] CONJUNCTION] PAUSE [CONJUNCT-2]

'John left and. He didn't even say good-bye.'

Thus, the prosody of coordination also points to an asymmetric structure in Hindi with the conjunction particle and rightmost conjunct forming a unit.

To sum up, the facts from binding, extraposition and prosody (intonational pause) with respect to coordination in Hindi suggest that the first conjunct is structurally more prominent than the second, and that the second conjunct forms a constituent with

the conjunction particle. This is exactly what we find in English that has a head initial structure of coordination. Thus, it is safe to conclude that coordination in Hindi also displays a head initial structure with the leftmost conjunct being more prominent syntactically. In a head initial language, like English, it is not that surprising that the leftmost conjunct is more prominent than the second conjunct since the second conjunct is a complement of the conjunction particle. Hindi, however, is a head final language, in general, with SOV as its canonical word order (Mahajan 1990, Bhatt 2005). See the bolded part in (7) that shows that the noun phrase and similarly the adpositional phrase (AdpP) is head final.

(7) [$_{NP}$ baccoN kii **maaN**] [$_{AdpP}$ pati **ko**] ghar bulaa-tii hai

[children of **mother**] [husband **ACC**] home call-HAB PRES

[N POSS **N**] [N **ADP**]

'The children's mother calls the husband home.'

Due to this word order difference but similarity in the structure of coordination with head initial languages, Hindi presents us with an interesting set of facts related to CCA. In the following section, we discuss the phenomenon of CCA and how it relates to the issue of the structure of coordination.

2. Close Conjunct Agreement and Coordination

Close conjunct agreement is a pattern of agreement in the context of coordination where

the predicate seems to agree with the closest conjunct rather than with the whole coordination phrase. For example, in some languages, such as Arabic, this pattern of agreement is observed if the verb precedes the subject (i.e., the VS order). This is illustrated by the Moroccan Arabic data in (8) below from Aoun et al (1994). Notice the verb *mʃa* agrees with the closest (first) conjunct *ʕumar*.

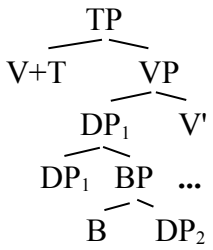
(8) **mʃa**	**ʕumar**	w	ʕali	
left.**MSG**	Omar	and	Ali	'Omar and Ali left.'

One way to access the leftmost conjunct in (8) is to appeal to the structure of coordination in (2) or (3). This is exactly the approach proposed by Benmamoun (1992), Johannessen (1993, 1998) and Munn (1993) who rely on the notion of government to establish an agreement relation between the verb and first conjunct. The assumption is that the agreed-with conjunct is in a more prominent position and thus the predicate has access to it under government (or Agree as in Soltan 2007).

According to Munn (1993), the BP (the phrase consisting of the conjunction particle as head and the rightmost conjunct as complement) is Chomsky-adjoined to the other conjunct that is structurally prominent. The verb can head-govern the specifier of its complement (exceptional government) and establish the agreement relationship with the coordination phrase DP_1 as shown in the configuration in (9), hence CCA.[7]

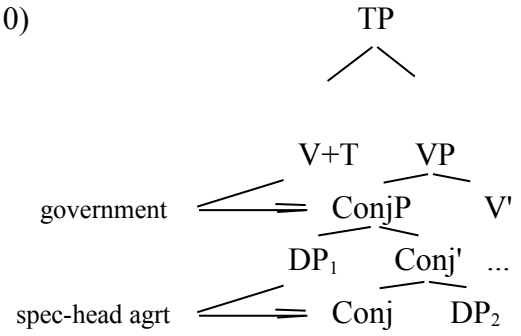
7 Soltan (2007) argues that the BP adjunct is merged later after Agree has taken place with the first conjunct (the only conjunct at the time Agree takes place), which accounts for CCA.

(9)



Johannessen (1993, 1998) assumes the spec-head structure as mentioned in (3). The ConjP acquires the features of the conjunct in its specifier through spec-head agreement relation followed by feature percolation from the head Conj to the ConjP. Verb agreement takes place under government with the ConjP, see (10). Since the ConjP has the syntactic features of the first conjunct, the verb shows first conjunct agreement. The conjunct in the complement position does not provide its features to the ConjP because it is not in a spec-head agreement relationship with the conjunction particle.

(10)



The common theme of both of the above analyses is that it is the first conjunct that is structurally more prominent and it is this structural prominence that explains CCA as it allows the first conjunct to be accessible as an agreement controller.

Thus, agreement (CCA) seems to pattern with binding, movement and prosody in privileging the first conjunct due to its configurational prominence. The

question is whether this patterning is genuine or just accidental due to the fact that the VS order and structural left to right asymmetry of coordination yield an outcome whereby the verb c-commands the leftmost conjunct and also is linearly adjacent to it. Hindi is the ideal language to test this question because coordination is head initial in Hindi with the specifier/prominent conjunct on the left but the verb is usually final (within the VP and the clause). Thus in Hindi, coordination and CCA should clearly help us delineate the role of linear adjacency/proximity vs. structural c-command in agreement, a possibility that is not easily available in VS languages such as Arabic.

It turns out that in Hindi, unlike in Arabic, it is the rightmost conjunct that enters into the close conjunct agreement relation. In (11), the verb *khariidii* displays the number and gender features of the rightmost (closest) conjunct *ek saaRii*.[8]

(11) maiN-ne ek chaataa aur ***ek saaRii*** khariid-ii

I-Erg an umbrella.MSG and ***a saree.FSG*** buy-PERF.***FSG***

'I bought an umbrella and a saree.'

(Kachru 1980, glosses and transcription modified for consistency)

According to Munn's and Johannessen's analyses the CCA facts in Hindi would suggest that the rightmost conjunct is structurally more prominent. However, as we argued in section 1, binding, movement, and prosody show that it is the first conjunct that is more prominent. Thus, the Hindi CCA facts present us with a paradox. However, this paradox

8 In general, the verbs in Hindi agree with the structurally most prominent argument that is not overtly case marked (Bhatt 2005).

is real only if CCA is sensitive to syntactic prominence only. On the other hand, if CCA is also sensitive to word order, the paradox might dissolve. In the following section, we attempt an alternative analysis for CCA that also takes linear word order into account.

3. An Alternative Analysis for CCA: The Role of Linear Adjacency/Proximity

To resolve the apparent paradox that Hindi CCA presents, we suggest that CCA is sensitive to both Agree (/government) and linear adjacency/proximity. Agree establishes a relation between the verb and the coordination phrase and linear adjacency/proximity makes the closest conjunct the most accessible member of coordination.[9] We should stress that linear adjacency/proximity does not obviate or nullify the role of Agree. This is easily evident from the fact that CCA is always with a member of a phrase that the verb can in principle enter into an agreement relation with. That is, Agree isolates the phrase that the verb can agree with but linear adjacency/proximity may select a linearly close nominal within that phrase.[10]

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9 One possibility is that full agreement takes place in the syntactic component through AGREE (Bhatt 2005) resulting from the resolution of the whole coordination phrase for number and gender. CCA, then is a result of a second instance of agreement relation, which is a surface phenomenon and is dependent on linear proximity (a version of this is also suggested by Marušič et al (2006) for Slovenian Last Conjunct Agreement), after the first AGREE relation has taken place in the syntactic component.

10 If linear adjacency/proximity plays a role in CCA, we expect it to be with the last conjunct when the verb follows the coordinated phrase, and with the first conjunct when the verb precedes the coordinated phrase (whenever it is pragmatically possible). This is found to be the case as is shown in (iii) (see also Davison 1991 for similar data). In (11) repeated here as (iiia), the verb follows the coordinated phrase and hence is linearly closer to the last conjunct and thus shows agreement with it. In (iiib), however, we see first conjunct agreement as the verb is linearly closer to the first conjunct.

(iii) a. maiN-ne ek chaataa aur ***ek saaRii*** khariid-ii
I-Erg an umbrella.MSG and ***a saree.FSG*** buy-PERF.***FSG***
'I bought an umbrella and a saree.'

b. Raam-ne kyaa khariid-aa ! us-ne khariid-ii **kursii** aur
Ram-Erg what.MSG buy-Perf.MSg he-Erg buy-Perf.**FSg** chair.**FSg** and

It should also be pointed out that CCA, which we argue is sensitive to linear adjacency/proximity, is an optional process in the sense that not all speakers use it, and even the speakers that employ it do not do so each time agreement takes place. In other words, it is not a stable process, which can be taken to indicate that it is not subject to rigid syntactic conditions but rather to purely linear order and prosodic factors.

While many issues in the context of CCA remain to be examined more closely, particularly the fact that in some languages CCA seems not to be available in the context of number sensitive items (Aoun et al. 1994, 1999, Munn 1999), we hope to have shown that CCA in Hindi provides a good testing ground for the roles of hierarchical and linear relations in the computation of the agreement relation.

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sofaa, jo us-e ham-ne manaa ki-yaa thaa
sofa.MSg which he-Dat we-Erg forbid do-Perf.MSg Pst.MSg
'What did Ram buy! He bought a chair and a sofa, which we had forbidden him!'

In (iiib), AGREE takes place in the syntactic component. It does not matter whether the coordinated object is extraposed or the verb is moved up; in either case, since the verb and the coordinated phrase are linearly adjacent/proximate in PF, the verb shows CCA with the conjunct (within the phrase with which AGREE was established) that is linearly closer to it, which happens to be the first conjunct here.

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