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Binding Facts in Hindi and the Scrambling Phenomenon

VENEETA SRIVASTAV DAYAL

1 Introduction

Gambhir (1981), in the first systematic analysis of word order in Hindi, discusses paradigms like the following:

(1) a. raam-ne mohan-ko kitaab dii [*S IO DO V*]
Ram-ERG Mohan-DAT book gave
'Ram gave Mohan a book.'

b. kitaab raam-ne mohan-ko dii [*DO S IO V*]
c. mohan-ko kitaab raam-ne dii [*IO DO S V*]
d. kitaab mohan-ko raam-ne dii [*DO IO S V*]
e. mohan-ko raam-ne kitaab dii [*IO S DO V*]
f. raam-ne kitaab mohan-ko dii [*S DO IO V*]

She notes that though (1a)–(1f) express the same proposition, (1a) can be considered basic since it is neutral with respect to preceding discourse. (1b)–(1f), on the other hand, signal shifts in emphasis that require context for full interpretation.

That the correspondence between an English sentence and its Hindi counterparts is one-to-many can be can be described by the statement, standard in typological literature, that English is a "fixed word order" language while Hindi is a "free word order" language. From the point of view of generative linguistics, however, this is not enough. Since language is held to be a system of rules, an investigation into what accounts for the freedom of word order is required in order to arrive at a more explanatory account of the phenomenon. The current assumption within the Government and Binding framework is that all languages

Theoretical Perspectives on Word Order in South Asian Languages
Miriam Butt, Tracy Holloway King, Gillian Ramchand (Eds.)

have a fixed word order at base.[1] "Free word order languages" differ from "fixed word order" languages in allowing an instance of move alpha, namely scrambling. In the case of the Hindi examples above, one can say that at D-structure all of them have the order of arguments S IO DO V, with the variations in surface order seen in (1b)–(1f) resulting from leftward movement of arguments.

Such an analysis begs the question of whether scrambling is an instance of A-movement or A′-movement, the two types of movement noted in the literature. Passive or raising constructions are instances of A-movement, involving movement of an NP from a theta marked position into a non-theta argument position in order to receive Case. Wh-movement or quantifier raising are instances of A′-movement, involving movement of an NP from a Case and theta marked position into a non-argument position in order for interpretation to take place. The claim that scrambling involves movement, therefore, entails that it should display the properties of A-movement or the properties of A′-movement. If it does not, it raises doubts about the adequacy of the standard binary classification of movement types. These issues have generated considerable theoretical interest in recent years.

In a study of scrambling in Japanese, Saito (1985) argues that scrambling is an instance of A′-movement by showing that the empirical behavior of scrambling is similar to that of wh-movement and quantifier raising. In particular, he analyzes scrambling as adjunction of NP's at the sentential level. Under this view a sentence like (1b), for example, would have an S-structure representation like the following with the DO adjoined to IP:

(2) a. [$_{IP}$ kitaab$_i$ [$_{IP}$ raam-ne mohan-ko t_i dii]]
book Ram-ERG Mohan-DAT gave
[DO$_i$ [S IO t_i V]]

Gurtu (1985) also analyses Hindi scrambling as an adjunction operation, thereby conflating it with A′-movement. Webelhuth (1989, 1992), however, draws attention to the fact that scrambling in German has, in addition to the properties associated with A′-movement, some properties of A-movement. He thus concludes that though scrambling involves adjunction as in (2a), the adjoined position is both an A and an A′ position. Déprez (1989) and Mahajan (1990) add further support to Webelhuth's stand that scrambling has properties associated with A-movement. Abstracting away from differences between their particular proposals, they both claim that two types of scrambling exist. One has

[1]See Hale (1983), however, for an alternative view in which languages may differ with respect to configurationality and word order at D-structure.

properties of A′-movement and involves adjunction to maximal projections. The other has properties of A-movement and involves movement into argument positions that are empty at D-structure. This latter option is made possible by the conception of phrase structure proposed by Pollock (1989) and Chomsky (1989). Under this view, the verbal complex is actually made up of several functional projections such as Agreement Phrase, Negation Phrase, Tense Phrase etc. which dominate VP. The specifier positions of these functional projections count as argument positions which may be generated empty. In languages that allow scrambling, NP's are generated VP internally and move into these empty Spec positions. Thus, (1b) is analysed along the lines of (2b), where XP and YP stand for functional projections:

(2) b. [$_{YP}$ kitaab$_i$ [$_{XP}$ raam-ne$_j$ [$_{VP}$ t_j mohan-ko t_i
book Ram-ERG Mohan-DAT
dii]]]
gave
[DO$_i$ [S$_j$ [t_j IO t_i V]]]

From this brief summary of the literature on scrambling, it is obvious that there is a fairly complex interaction between empirical and theoretical considerations. The primary thrust of this paper is to reexamine the empirical motivation behind the view that scrambling is an instance of A-movement. In particular, it focuses on the claim made by Mahajan (1990) that scrambled NP's in Hindi can serve as antecedents for reflexives. Since Binding Theory (BT) refers to antecedents in argument positions only, he uses this fact to argue that the landing site of scrambling must be an argument position. While I agree with Mahajan that BT is an effective diagnostic for distinguishing types of movement, I take issue with his application of the diagnostic. Using a general strategy of articulating a version of BT that covers the core binding facts in Hindi before investigating the impact of scrambling on binding possibilities, I come to a different conclusion from him about the type of movement involved in scrambling.

I begin by discussing scrambling to presubject position and establish that the resulting binding possibilities are incompatible with a view of such scrambling as movement to an A-position. I then turn to intermediate scrambling and show that there is no evidence from BT to argue for movement to A-position there either. The conclusion, clearly, is that as far as BT goes, scrambling is an instance of A′-movement only, not A-movement. I then consider those properties that distinguish scrambling from other instances of A′-movement. I follow the

lead of several other researchers in drawing the conclusion that the present typology of movement types is too coarse-grained to account for the observed distinctions.

2 Presubject Scrambling as A′-movement

In this section, I will be concerned with scrambling to a presubject position, i.e., I will be considering examples like (1b)–(1e). To keep the discussion simple, I will use an ordinary transitive verb but the conclusions carry over, without any modification, to the ditransitive structures in (1). (3b) is an instance of presubject scrambling:

(3) a. raam-ne mohan-ko maaraa
Ram-ERG Mohan-ACC beat
'Ram beat Mohan.' [*S O V*]

b. mohan-ko$_i$ raam-ne t_i maaraa
[*O S V*]

In order to see what BT can tell us about the nature of scrambling in (3b) let us establish first how it applies to basic transitive structures like (3a). Towards this end, consider the following paradigm:

(4) a. raam-ne$_i$ apne-aap-ko$_{i/*j}$/us-ko$_{*i/j}$ maaraa
Ram-ERG self-ACC/him-ACC beat
'Ram beat self/him.' [*S O V*]

b. raam-ne$_i$ [apne$_{i/*j}$/uske$_{*i/j}$ bhaii-ko] maaraa
Ram-ERG self's/his brother-ACC beat
'Ram beat self's/his brother.' [*S O V*]

c. raam-ne$_i$ raam-ko$_{*i}$ maaraa
Ram-ERG Ram-ACC beat
'Ram beat Ram.' [*S O V*]

As we can see, there is nothing particularly exotic about the binding possibilities of Hindi. The one thing to note is that when a pronoun is in Spec of NP, as in (4b), it cannot be coreferential with the subject, while a reflexive in the same position must be. This contrasts with English, where both the pronoun and the reciprocal is possible in that position. Hindi is similar in this respect to Latin, Russian, and Danish etc.. We may safely adopt for the basic cases considered in (4), then, a fairly standard version of BT:[2]

[2]In this paper I will not be concerned with how BT applies to elements inside embedded clauses. See Gurtu (1985), Harbert and Srivastav (1988) and Mohanan (1990) for discussion.

(5) a. Principle A: An anaphor must be bound in its governing category.

b. Principle B: A pronoun must be free in its governing category.

c. Principle C: An R-expression must be free (everywhere).

Governing Category is defined as the minimal domain containing the expression, its governor and an accessible subject/SUBJECT. *Bound* and *Free* refer to coindexing of an element with a c-commanding argument.

We are now in a position to evaluate the impact of scrambling on binding possibilities. Consider what happens when the the DO of (4a)–(4b) is scrambled to a presubject position:

(6) a. apne-aap-ko$_{i/*j}$/us-ko$_{*i/j}$ raam-ne$_i$ maaraa
self-ACC/him-ACC Ram-ERG beat
'Ram beat self/him.' [*O S V*]

b. [apne$_{i/*j}$/uske$_{*i/j}$ bhaii-ko] raam-ne$_i$ maaraa
self's/his brother-ACC Ram-ERG beat
'Ram beat self's/his brother.' [*O S V*]

We see that scrambling makes absolutely no difference to the binding possibilities, BT applies as if the DO were in its base position. This is parallel to the case of wh-movement seen below:

(7) [Which picture of himself]$_i$ did John$_i$ see t_i ?

The grammaticality of (7) suggests that Principle A of BT applies as if the moved wh-phrase were in its base position and, under standard assumptions, this is done by reconstruction.[3] Transferring this to the case of scrambling in (6a)-(6b), the implication is that the scrambled DO is in an A′-position and hence subject to reconstruction.

This finding, of course, is not incompatible with Mahajan's account, which allows for the presubject position to be an A′ as well as an A position, though not simultaneously. Let us see whether there are binding facts that would support the view that the scrambled object is in A-position. If the scrambled position can be an A-position, the prediction is that it will be able to bind a reflexive. Example (8a) shows that this is not possible:

[3]In the case of raising structures, on the other hand, BT is sensitive to the configuration at S-structure, as shown by (i):

(i) [John$_i$ appeared to himself [t_i to be winning the race]]

If reconstruction were to happen, Principles A and C would be violated. It follows that there is no reconstruction in cases of A-movement.

(8) a. *mohan-ko$_i$ apne-aap-ne$_i$ maaraa
Mohan-ACC self-ERG beat
'Self beat Mohan.' [*O S V*]

Here we have a reflexive in subject position and an antecedent in the presubject scrambled position. The ungramaticality of the sentence provides clear evidence that the presubject position is not an argument position, and hence the movement involved in scrambling is not A-movement. The ungrammaticality of (8a) is expected if scrambling is A′-movement. Once the DO is reconstructed, Principles A and C are both violated.

The conclusion we have drawn from (8a) directly contradicts Mahajan's claim that reflexive binding is possible in such a construction. Mahajan's claim is based on examples like (8b), which differs from (8a) in that the reflexive is in Spec of DO:[4]

(8) b. *mohan-ko$_i$ [apne$_i$ baccoN-ne] maaraa
Mohan-ACC self's children-ERG beat
'Self's children beat Mohan.' [*O S V*]

It is worth emphasizing that Mahajan himself considers such examples marginal. In my own judgement, and most of the speakers I have consulted, it is unacceptable. Now, the point to note is that there is no explanation for the ungrammaticality, or even the alleged marginality, of (8b) under the view that scrambling can be to an A position. Since the reflexive would have a c-commanding antecedent, Principle A should be satisfied. If, however, scrambling is only A′-movement, as I am suggesting, the DO would be reconstructed and the resulting violation of Principle A would account for its ungrammaticality.[5]

On the basis of (8a) and (8b), then, we can conclude that the evidence from reflexive binding shows presubject scrambling to be an instance of A′-movement only. I will now discuss cases of pronominal binding and show that the facts are compatible with the view that presubject scrambling is unambiguously A′-movement. Let us consider the pronominal counterparts of (8):

(9) a. *mohan-ko$_i$ us-ne$_i$ maaraa
Mohan-ACC he-ERG beat
'He beat Mohan.' [*O S V*]

[4]Mahajan's example (40) on page 33 also has an adverbial in it. The simplification here does not affect the point of the discussion.

[5]At the end of Section 3, I discuss a dialect in which anaphors may not be subject to Principle A. That may bear on the difference between Mahahan's judgement of (8b) and mine.

b. mohan-ko$_i$ [uske$_i$ baccoN-ne] maaraa
Mohan-ACC his children-ERG beat
'His children beat Mohan.' [*O S V*]

These facts follow straightforwardly on the view that presubject scrambling is an instance of A′-movement. Once reconstruction takes place, the relevant structures will be as follows:

(10) a. [$_{IP}$ us-ne$_i$ [$_{VP}$ mohan-ko$_i$ maaraa]]
he-ERG mohan-ACC beat

b. [$_{IP}$ [$_{NP}$ uske$_i$ baccoN-ne] [$_{VP}$ mohan-ko$_i$ maaraa]]
his children-ERG Mohan-ACC beat

In (10a), the DO is bound by the subject in violation of Principle C, hence the ungrammaticality. In (10b), the pronoun, which is in Spec of NP, and the DO do not c-command each other. There is no violation of BT, hence the grammaticality.[6]

To sum up this section, we looked at the core cases of binding in transitive structures like (4), and decided upon the version of BT articulated in (5). We then considered cases where the DO is scrambled to presubject position and saw that reflexive binding facts shows this to be unambiguously an instance of A′-movement, a conclusion that is also compatible with the pronominal binding facts.

3 Binding in Ditransitive Structures

Let us turn now to the case of intermediate scrambling, i.e, to structures like (1f). Recall that the canonical order of arguments in Hindi is S IO DO V. In (1f) the DO moves to a position between the subject and IO and the question we are interested in investigating is whether this is an A or an A′ position. In order to see what BT tells us about this position, I will once again articulate a version of BT that works for the core cases before applying it to scrambled structures.

The binding relationship between subject and object in Hindi, we saw in Section 2, was pretty straightforward in the case of simple transitive sentences. Thus the version of BT that we used as a diagnostic in analysing the scrambled sentences was the standard one. When we turn to ditransitive structures, however, the binding relationship is

[6]I am grateful to an anonymous reviewer for pointing out that (9) does not provide evidence against Mahajan's claim that scrambling can be A or A′-movement. The ungrammaticality of (9a), for example, is predicted. If the DO is in argument position, Principle B is violated; if it is in A′ position, Principle C is violated after reconstruction. The grammaticality of (9b) is also predicted. The DO cannot be in argument position since there will be a violation of Principle B. However, if it is in A′ position, reconstruction will take place and there will be no violation of BT, as shown in (10b).

fairly complex even in the basic cases. It is therefore even more important that we make our assumptions about BT explicit before using it as a diagnostic.

It is a well-documented fact that the Hindi reflexive is subject oriented. Analogous to this is the fact that the Hindi pronoun is anti-subject oriented (Mohanan 1990). In (11), for example, the reflexive in the DO cannot corefer with the IO, but must corefer with the subject. Similarly, the pronoun in DO must be disjoint in reference with the subject but may corefer with the IO:

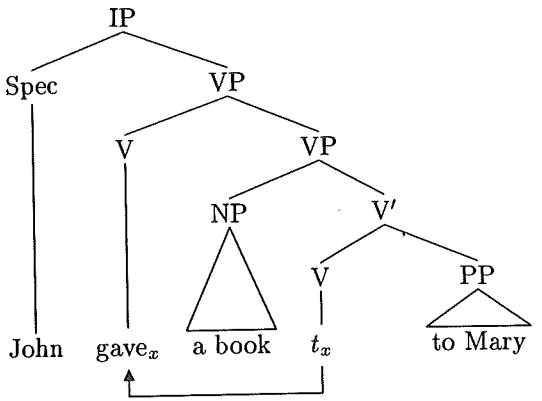
(11) a. raam-ne$_i$ mohan-ko$_j$ [apnii$_{i/*j}$/uskii$_{*i/j/k}$
Ram-ERG Mohan-DAT self's/his
kitaab] dii
book gave
'Ram gave Mohan self's/his book.' [*S IO DO V*]

b. raam-ne$_i$ mohan-ko$_j$ apne$_{i/*j}$/uske$_{*i/j/k}$
Ram-ERG Mohan-DAT self/his
baare-meN bataayaa
about told
'Ram told Mohan about self/him.'

It is immediately obvious from the data here that the version of BT we had adopted earlier does not work, or rather seems to work selectively. Principles A and B do seem to be in effect but only in relation to the subject; they do not seem to apply to IO. The problem is to find a way to capture this generalization in structural terms. It is obvious that the subject is hierarchically superior to the other arguments, but not so clear what the structural relationship between IO and DO is. I will consider two current ideas about binding in ditransitive structures that can be used to explain the (anti) subject orientation in Hindi.

An analysis of ditransitive structures in English that has proved quite influential was given by Larson (1988), and can be illustrated by (12):

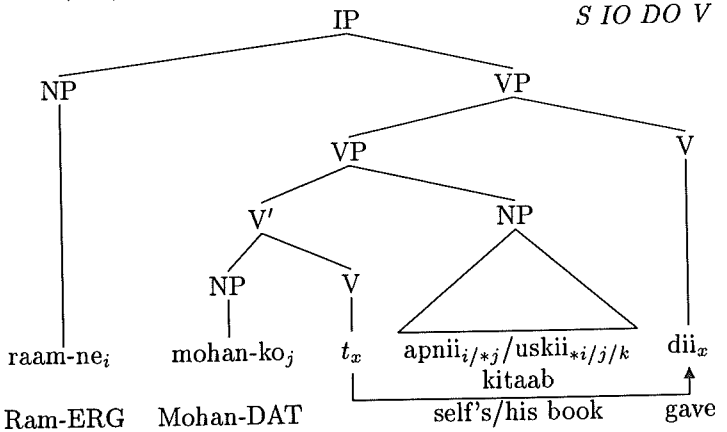
(12)



The basic idea is that the VP consists of an empty V taking a VP complement whose Spec is the DO, whose head is the verb and whose complement is the IO. The surface order is a result of the verb raising to the empty V position. Note that in this structure, the DO asymmetrically c-commands the IO so that it is predicted that DO can bind IO, but IO cannot bind DO. In fact, it is the asymmetric binding possibilities that is the primary motivation for Larson's analysis of such verbs in English.

Translating Larson's proposal to Hindi, we get the following representation for (11a):

(13) *S IO DO V*



This analysis, we can see, accounts correctly for the binding possibilities shown here. Since the IO does not c-command the DO, Principles A and B ensure that the reflexive or the pronoun inside DO is bound or free with respect to the subject only. Larson's account, how-

ever, cannot be accepted as it stands because it makes an incorrect prediction about binding of elements in IO by DO. Since the DO c-commands IO, it should be possible for it to bind reflexives inside IO. This fact does not hold in Hindi, as shown by the following:

(14) raam-ne$_i$ [apnii$_{i/*j}$ maaN-ko] bacca$_j$ thamaayaa
Ram-ERG self's mother-DAT child handed
'Ram handed self's mother the child.' [*S IO DO V*]

One way of reconciling the facts of Hindi while preserving Larson's insight is to incorporate linear order in addition to hierarchical structure in the definition of binding, as was proposed by Barss and Lasnik (1986). BT would then refer to antecedents that c-command and precede, and there would be a simple explanation for the range of facts considered here. In (13), for example, the IO neither c-commands nor precedes DO and therefore does not count as an antecedent for the reflexive/pronoun in it. In (14) the DO c-commands but does not precede the IO, and therefore cannot bind the reflexive inside IO. In Hindi ditransitive structures, then, the only position which precedes and c-commands the NP's inside the VP is the subject, giving rise to the (anti) subject orientation effect.

The core facts of binding in Hindi ditransitives, then, can be accounted for with a minimal modification to the Larsonian analysis of such structures. Let us now turn to another proposal in the literature that can account for the facts we are considering. It has been suggested that subject orientation of anaphors is due to LF raising of the anaphor to INFL (Lebeaux 1983, Chomsky 1986, Pica 1987, among others). If Principle A applies after such raising, the subject is the only c-commanding argument that can bind anaphors inside VP. Recently, this account has been extended to cover anti-subject orientation of Scandinavian pronouns by Hestvik (1992). He argues that pronouns in Scandinavian also raise to INFL at LF. When Principle B applies, the subject is the only c-commanding argument, and therefore it enforces disjointness only with the subject. According to this approach, the LF structure of (11a) would be as in (15), where BT applies to elements in INFL enforcing binding or disjointness with the subject:

(15) [$_{IP}$ raam-ne$_i$ [$_{INFL}$ apnii$_{i/*j}$/uskii$_{*i/j}$ [$_{VP}$ mohan-ko
Ram-ERG self's/his Mohan-DAT
[t kitaab] dii]]]
book gave

Note that in this approach, the relationship between the DO and IO at D-structure is not relevant for purposes of binding and the VP could have a flat structure or a structure in which the DO or the IO asymmetrically c-commands the other or a structure in which they are generated in either order, as suggested for Bangla by Bayer (1990).[7]

In this section I have outlined two ways in which binding possibilities in Hindi ditransitive structures can be accounted for. One uses the structure of ditransitives proposed by Larson in conjuction with a version of BT that refers to antecedents that precede and c-command. The other posits raising of anaphors and pronouns to INFL at LF where the only c-commanding NP is the subject. The choice between the two approaches is not critical for purposes of this paper. The important thing, rather, is to make explicit the core binding facts since they are not standard, and show how BT can deal with them. I believe that the discussion here, though by no means exhaustive, provides a basis for testing the type of movement involved in scrambling out of such structures.

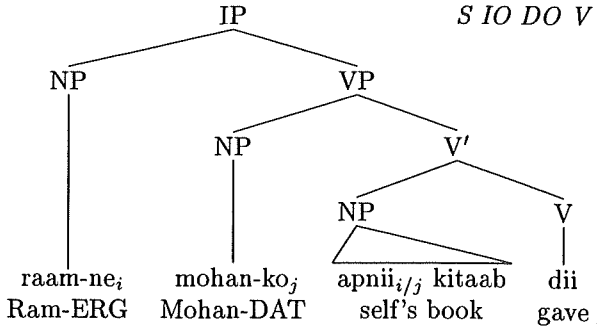
Before concluding this section, I would like to note a difference in dialects that is of relevance in the discussion of scrambling to follow. The account I have given is based on the dialect of those speakers who do not find coreference between a reflexive in DO and IO acceptable. There are some speakers, however, for whom the anaphor is not strictly subject oriented (Gurtu 1985, Mahajan 1990). For them the binding possibilities are as follows:

(16) a. raam-ne$_i$ mohan-ko$_j$ [apnii$_{i/j/*k}$/uskii$_{*i/j/k}$
Ram-ERG Mohan-DAT self's/his
kitaab] dii
book gave
'Ram gave Mohan self's/his book.' [*S IO DO V*]

Focusing exclusively on the possibility of the IO binding the reflexive in the dialect under discussion, Gurtu (1985), Mahajan (1990) and Déprez (1989) take the IO in Hindi to asymmetrically c-command the DO, yielding representations like the following for (16a):

[7] LF movement is generally assumed to be unbounded, thereby accounting for the fact that subject oriented anaphors in Italian, Chinese etc. can be bound long distance. The Hindi anaphor, however, must be bound in the domain of the finite clause (Gurtu 1985, Mohanan 1990) but this does not invalidate the view that there is INFL raising of the anaphor in Hindi. Hindi does not allow unbounded wh-movement out of tensed clauses at LF. We might assume that long distance movement of the Hindi anaphor is blocked in the same way that wh-movement is blocked (Srivastav 1991).

(16) b.



If the IO counts as an antecedent for the reflexive in DO, however, it is predicted that Principle B will enforce disjointness between IO and a pronoun in DO. This, as we know, is not the case. A pronoun is perfect for that reading. Note also that even in this dialect reflexives and pronouns are in complementary distribution with respect to coreference with the subject. Thus it is not clear what assumptions about Principle B would be needed to make this analysis work. It seems to me that failure to address this issue is a serious omission in any account that hopes to use reflexive binding as a diagnostic for movement involving these positions.

I have already provided an account of binding possibilities for the majority dialect and will now attempt to reconcile it with the binding possibilities in the dialect where reflexives are not subject oriented. There are a few things worth noting about this dialect. As mentioned above, even though the reflexive can corefer with the IO, a pronoun is strongly preferred over the reflexive for this reading. That is, this dialect does not disagree with the majority dialect in the anti-subject orientation of pronouns. A second significant fact is that coreference of the reflexive with the subject is far more robust than coreference with IO.[8] It seems to me that there are two separate phenomena at work which are amenable to separate explanations. I suggest that in all dialects of Hindi BT is as outlined above, which accounts for the subject orientation of reflexives and anti-subject orientation of pronouns. In addition, there is a dialect in which reflexives that are not bound in the sense of BT, may still be acceptable as long as there is a possible antecedent preceding it.[9] This would explain not only the possibility of the reflexive coreferring with the IO for some speakers, but also their

[8] I thank Gurpreet Bains for confirming this fact, as well as for other judgements that lead me to make my claims about binding possibilities in this dialect sharper.

[9] I hesitate from calling this a logophoric reading since I do not think a referent in the discourse licenses reflexives.

bias towards subject orientation and their preference for a pronoun for coreference with IO. I therefore assume that there is no dialect difference with respect to BT in Hindi, but that there is one with respect to the acceptability of reflexives which are not bound. And from here on I will use the symbol '?' to reflect the intuition that even for speakers who accept it, coreference of the reflexive in DO with IO is neither as robust as coreference with the subject nor as robust as coreference between a pronoun in that position and IO.

Let me go back at this point to an unsolved mystery with respect to judgements discussed in connection with presubject scrambling. In the dialect of most speakers (8b), repeated below, is ungrammatical, while it is marginal in the dialect Mahajan reports on.

(8) b. *?mohan-ko$_i$ [apne$_i$ baccoN-ne] maaraa
Mohan-ACC self's children-ERG beat
'Self's children beat Mohan.' [*O S V*]

Recall that on his theory (8b) should be fully grammatical since the presubject position can be an A-position. Mahajan (1990) notes in a footnote (#17, p. 33) that such structures are odd because a pronoun is possible, and therefore preferred in place of a reflexive, though he admits that there is no clear answer to why that should be the case.

In the present approach, on the other hand, the scrambled DO is not in argument position, and there is consequently a violation of Principle A for all speakers. For those who accept non-bound reflexives, however, it is possible that the scrambled DO marginally licenses the reflexive in (8b). Note that (8a), repeated below, is still predicted to be ungrammatical because of a violation of Principle A and C after reconstruction:

(8) a. *mohan-ko$_i$ apne aap-ne$_i$ maaraa
Mohan-ACC self-ERG beat
'Self beat Mohan.' [*O S V*]

In this section I have listed the core binding facts in Hindi ditransitive structures, and shown how a principled account can be given for them. I have also tried to reconcile the judgements provided in Mahajan with those of the majority dialect. Let us turn now to intermediate scrambling and see what BT tells us about the type of movement involved.

4 Intermediate Scrambling as A′-movement

Mahajan argues that scrambling to intermediate positions is exclusively to A-positions. There are two pieces of evidence he gives in support of this. One, he claims that such scrambling creates new antecedents

for reflexives. In (17a), for example, the NP's are in their canonical positions and the reflexive inside IO cannot be bound by the DO. In (17b), the DO is fronted and, according to Mahajan, the reflexive can now be bound by it:

(17) a. raam-ne$_i$ [apne$_{i/*j}$ baccoN-ko] sher$_j$ dikhaayaa
Raam-ERG self's children-DAT lion showed
[S IO DO V]

b. raam-ne$_i$ sher$_j$ [apne$_{i/*?j}$ baccoN-ko] dikhaayaa
Ram-ERG lion self's children showed
'Ram showed self's children the lion.' *[S DO IO V]*
(Mahajan = apne$_{i/j}$)

Mahajan's judgements, however, are not accepted by most speakers, and I indicate in the examples above my interpretation of the judgements, noting Mahajan's judgements in parentheses where there is a difference. In the majority dialect, the reflexive in (17b) can only be bound by the subject. In the dialect where coreference with DO is possible, it is marginal in the sense discussed in the previous section. That is, subject coreference is salient, and furthermore, the preferred way to get coreference with the scrambled DO is via a pronoun. The right generalization clearly is along the lines suggested for (7b). As far as BT goes, the scrambled DO does not count as an antecedent, accounting for the possibility of pronominal coreference for all speakers and the impossibility of reflexive binding for most. The speakers who accept reflexives coindexed with the scrambled DO are those for whom non-bound reflexives can be licensed by any preceding NP. The scrambled DO provides such a licensor. It is clear from an examination of the full range of binding possibilities, then, that (17b) shows intermediate scrambling to be to A′-position, not to A-position.

The second piece of data that Mahajan provides in support of the view that intermediate scrambling is exclusively A-movement, as opposed to presubject scrambling, which may be either A or A′-movement, is based on examples like (18b), derived from (18a). Again, I indicate where my findings deviate from Mahajan's:

(18) a. raam-ne$_i$ mohan-ko$_j$ [apnii$_{i/*?j}$ kitaab] dii
Ram-ERG Mohan-DAT self's book gave
'Ram gave self's book to Mohan.' *[S IO DO V]*
(Mahajan = apnii$_{i/j}$)

b. [apnii$_{i/*j}$ kitaab] raam-ne$_i$ mohan-ko$_j$ dii
self's book Ram-ERG Mohan-DAT gave
'Ram gave self's book to Mohan.' *[DO S IO V]*

According to Mahajan, the reflexive in DO can refer to either the subject or the IO when it is in its base position. When it is fronted to the presubject position, via the intermediate position, it can only refer to the subject. Mahajan gives the following derivation for (18b):

(19) a. [apnii$_{i/*j}$ kitaab]$_k$ raam-ne$_i$ t'_k mohan-ko$_j$
self's book Ram-ERG Mohan-DAT
t_k dii
gave

The presubject position can be an A′-position and allows reconstruction to t'_k, which makes binding by the subject possible. The missing reading, the one where the reflexive is bound by IO, is evidence that reconstruction stops at the intermediate position t'_k. The IO does not c-command this position and binding of the reflexive is ruled out. Since reconstruction to the base position where the IO would c-command it is not possible, he concludes that movement from the base position t_k to the intermediate position t'_k is A-movement.

In the approach I am advocating, it is not crucial whether scrambling is directly from base position to presubject position, or proceeds via intermediate scrambling. If scrambling is first to intermediate position and then to presubject position, both are instances of A′-movement and reconstruction takes place to the base position:

(19) b. [apnii$_{i/*j}$ kitaab]$_k$ raam-ne$_i$ (t'_k) mohan-ko$_j$
self's book Ram-ERG Mohan-DAT
t_k dii
gave

The presubject position being an A′-position, reconstruction is expected, accounting for the binding of the reflexive by the subject, as in Mahajan's account. The question that remains is why the marginal reading in which the reflexive corefers with the IO is lost. Given my basic claim that coreference with IO in (18a) is not due to BT, but is made available for some speakers due to the presence of a preceding NP, the answer to this is obvious. This reading is unavailable because the licensing of a non-bound anaphor is done at S-structure, where the IO does not precede the scrambled DO and cannot license the reflexive.

We see, then, that upon closer examination, the arguments Mahajan gives from reflexive binding do not warrant treating intermediate scrambling as an instance of A-movement. There is, however, an argument from reciprocal binding that needs to be discussed before I can claim that intermediate scrambling is an instance of A′-movement.

Jones (1993, forthcoming) reports that Hindi speakers that he has consulted agree with my judgements, and not Mahajan's with respect

to reflexive binding. However, his informants do marginally allow for reciprocal binding in certain cases, and my own intuitions accord with his findings. Two of the relevant cases are given in (20). (20a) is a basic ditransitive structure and (20b) is an ordinary transitive with DO scrambled to presubject position:

(20) a. laRkiyoN-ne laRkoN-ko$_j$ [ek duusre-kii$_{?j}$ kitaabeN]
girls-ERG boys-DAT each other's books
diiN
gave
'The girls gave the boys each other's books.' [*S IO DO V*]

b. ?jaun aur meri-ko$_i$ ek duusre-ne$_i$ dekhaa
John and Mary-ACC each other-ERG saw
'John and Mary saw each other.' [*O S V*]

Note that in (20a) even though the reciprocal is better than a reflexive when coreference with IO is intended, it is not perfect. The pronoun is still the preferred option. It seems to me, therefore, that this is not in fact a Principle A effect, and may be amenable to a functional explanation. Turning to (20b), Jones notes that the acceptability of this structure is somewhat improved if the context of discourse makes John and Mary salient. This suggests again that the phenomenon in question is not, strictly speaking grammatical, and one is lead to speculate that the Hindi reciprocal may not be a true anaphor. A piece of supporting evidence for this comes from the following:

(21) laRke aur laRkiyoN-ne$_i$ dekhaa
boys and girls-ERG saw
ki [unkii$_i$/apnii$_{*i}$/ek duusre kii$_{?i}$ tasviireN]
that their/self's/each other's pictures
bik rahii thiiN
were selling
'The boys and girls saw that their pictures were on sale.'

It is clear from reflexive and pronominal binding that the finite complement in (21) constitutes a binding domain. That the reciprocal is marginally possible in this position shows that the explanation must lie outside of BT. I will suggest here that since the reciprocal gives more specific information than the pronoun it is more informative, in a Gricean sense. And a cooperative listener may accept it for that reason in positions where BT allows a pronoun not an anaphor. What seems quite clear to me even from this brief look at the Hindi reciprocal is that it cannot be used as a sound diagnostic for A-movement in scrambling structures, since its distribution does not seem to be constrained by Principle A.[10]

To sum up so far, I have reviewed the evidence from anaphor binding that has been presented in support of the view that intermediate scrambling must be to A-positions, and shown that BT has not been applied correctly. Once the subtle but real differences in judgements are taken into account, the anaphor binding facts turn out to be better accounted for in terms of intermediate scrambling as A′-movement. I have also emphasized that the possibility of pronominal coreference in these structures provides an important control since there is no dialect difference at work with regard to coreference possibilities for pronouns. The absence of Principle B effects with intermediate scrambling are therefore additional support that scrambled objects do not count as antecedents. Before concluding this section, however, I would like to bring in one final piece of data that appears, at first glance, to be problematic for the view that intermediate scrambling is an instance of A′-movement.

Consider the contrast in the following examples with respect to the possibility of coreference between a pronoun in DO and IO:

(22) a. raam-ne mohan-ko$_j$ [uskii$_j$ kitaab] lautaaii
Ram-ERG Mohan-DAT his book returned
'Ram returned Mohan his book.' [*S IO DO V*]

b. raam-ne [uskii$_{*j}$ kitaab] mohan-ko$_j$ lautaaii
Ram-ERG his book Mohan-DAT returned
'Ram returned his book to Mohan.' [*S DO IO V*]

As discussed in Section 3, a pronoun in DO can corefer with IO in the basic ditransitive structure of (22a) but when the DO is scrambled to the left of IO, as in (22b), this reading is lost. But if scrambling is A′-movement, it should allow reconstruction to the base position, thereby making the intended coreference available. That it does not, therefore, appears problematic for this analysis. Note, however, that (22b) is also problematic for the view that the scrambled DO is in A-position. Since the pronoun is in Spec of NP, it does not c-command IO, and there should be no Principle C violation and coreference should be possible.

In order to explain the data, let us step back a minute and consider a consequence of the modified Larsonian approach that we have adopted. Recall that in the basic (unscrambled) ditransitive structure, the IO

[10]Reciprocal binding by scrambled arguments have been noted for German (Webelhuth 1989, Frank et al (1992) and Bangla (Sengupta 1990), but I have not seen reflexive binding mentioned except for Hindi by Mahajan. I don't know, at this point, whether the approach I am taking to Hindi reciprocals would appply to these languages.

precedes but does not c-command the DO, and the DO c-commands but does not precede the IO. Thus neither counts as an antecedent for the other. This suggests that the distribution of pronouns and R-expressions will be unrestricted for these NP's. (23a) and (23b) show that this is not the case:

(23) a. raam-ne mohan-ko$_j$ [uskii$_j$ kitaab] dii
Ram-ERG Mohan-DAT his book gave
'Ram gave Mohan his book.' [*S IO DO V*]

b. raam-ne us-ko$_j$ [Mohan-kii$_{*j}$ kitaab] dii
Ram-ERG he-DAT Mohan's book gave
'Ram gave him Mohan's book.' [*S IO DO V*]

The fact that a pronoun in DO can corefer with an R-expression in IO, as in (23a) is expected, as just mentioned. What is unexpected is the fact that a pronoun in IO cannot corefer to an R-expression in DO, as shown in (23b). Since neither is an antecedent of the other, Principles B and C should not be violated. That there is no such violation of BT is further shown by (23c), where two R-expressions in those positions may seem somewhat repetitive, but do not give rise to ungramamticality:

(23) c. raam-ne mohan-ko$_j$ [mohan-kii$_j$ kitaab] dii
Ram-ERG Mohan-DAT Mohan's book gave
'Ram gave him Mohan's book.' [*S IO DO V*]

Given the range of facts considered here, I conclude that the unacceptability of (23b) cannot be due to a BT violation, but due to a constraint against R-expressions following pronouns.[11]

Turning back to the scrambling cases in (22), then, we can give a parallel explanation for the contrast. Since the constraint I am alluding to is based on linearity, it is not implausible to assume that it applies at S-structure. Scrambling of DO in (22) alters the base order, and coreference is now possible only if the position of pronoun and R-expression is switched, as in (24):

(24) raam-ne [mohan-kii$_j$ kitaab] us-ko$_j$ lautaa dii
Ram-ERG Mohan's book him-DAT returned
'Ram returned Mohan's book to him.' [*S DO IO V*]

[11]The claim that backward pronominalization is impossible in Hindi is discussed in Kachru (1980) and Subbarao (1984). To take a stand on the status of backward pronominalization in Hindi is beyond the scope of the present paper. I will settle for making the weaker claim that for arguments inside VP at least, pronominals must follow the R-expressions with which they are coindexed and not the other way around.

Further proof that it is linear order at S-structure that is critical here, comes from sentences in which the DO and IO are both scrambled to presubject position:

(25) a. [uskii$_{*i/*j}$ kitaab] mohan-ko$_j$ raam-ne$_i$ lautaaii
his book Mohan-DAT Ram-ERG returned
[*DO IO S V*]

b. mohan-ko$_j$ [uskii$_{*i/j}$ kitaab] raam-ne$_i$ lautaaii
Mohan-DAT his book Ram-ERG returned
'Ram returned his book to Mohan.' [*IO DO S V*]

The two presubject positions are A′-positions under the present account and require reconstruction. As expected, the pronoun must be disjoint with the subject, regardless of the relative ordering of scrambled elements. But whether it can corefer with the IO is decided on the basis of surface linear order alone. It is thus ruled out in (25a), but acceptable in (25b).

In this section, I have examined binding possibilities with intermediate scrambling, and shown that intermediate scrambling cannot be an instance of A-movement since it predicts that anaphor binding from this position should be perfect, and pronominal coreference ruled out. Both predictions are incorrect. Anaphor binding is, at best, weak and pronominal coreference perfect. Putting together the conclusions for presubject and intermediate scrambling, we can safely say that BT, when applied carefully, shows that scrambling is not an instance of A-movement.

5 Scrambling as Atypical A′-movement

As far as the binding facts go, it is amply clear that scrambling is not an instance of A-movement, but rather an instance of A′-movement. In this section, I will review evidence that shows that scrambling does not have all the properties that are typically associated with A′-movement. I will conclude that a binary classification of movement types is insufficient to accommodate the types of movements under discussion.

In Section 2 it was noted that sentences like (9b), repeated below, are perfectly wellformed in Hindi:

(9) b. mohan-ko$_i$ [uske$_i$ baccoN-ne] t_i maaraa
Mohan-ACC his children-ERG beat
'His children beat Mohan.' [*O S V*]

It was pointed out that this poses no problems as far as BT is concerned. Since the scrambled object is in A′-position, it will be reconstructed. The two NP's not being in a c-command relationship, Principles B and C will not be violated, accounting for its grammaticality.

Note, however, that the possibility of reconstruction implies that the trace left behind by scrambling must be a variable. Coindexation of a variable with a pronoun to its left should result in a weak crossover violation. The following contrast, noted by Gurtu (1985), shows the atypical behavior of scrambling:

(26) a. *uskii$_i$ maaN kis-ko$_i$ pasand kartii hai
his mother whom likes
[*S O V*]

b. kis-ko$_i$ uskii$_i$ maaN t_i pasand kartii hai
whom his mother likes
'Who is such that his mother like him?' [*O S V*]

In (26a) there is a *wh-in-situ*, which is assumed to raise at LF into Spec position, leaving behind a variable trace. Coindexation with a pronoun to its left is consequently bad. In (26b), however, the *wh* has been scrambled, and coindexation of the trace and the pronoun is possible. If there are only two types of movements possible, and one leaves variable traces, the other NP traces, the conclusion must be that the trace in (26b) is an NP trace.

The absence of weak crossover effects with scrambling is a robust phenomenon, and is attested in every language that has scrambling. As such, it constitutes the best evidence for the view that scrambling has properties of A-movement. This conclusion, of course, rests on the premise that weak crossover violations are symptomatic of all and only A′-movements. Examples (27a)–(27b) certainly seem to suggest this:

(27) a. *Who$_i$ did his$_i$ brother beat t_i?
b. Everyone$_i$ appears to his$_i$ mother t_i to be intelligent.

However, as pointed out to me by an anonymous reviewer, topicalization does not give rise to such violations even though its standard analysis is in terms of A′-movement (Baltin 1985):

(27) John$_i$, his$_i$ brother beat t_i.

Saito (1992) argues that if a particular instance of A′-movement is semantically vacuous, it will not create operator-variable chains. Since weak crossover violations are manifested only in operator-variable dependencies, the absence of weak crossover effects in scrambling is to be expected if scrambling is semantically vacuous.[12] Further arguments in support of the view that scrambling is semantically vacuous A′-movement is given in Frank et al. (1992). We see then that weak crossover facts can be incorporated within a view of scrambling as

[12]Saito (1992), however, takes English topicalization to be non-vacuous and tries to show that it does display weak crossover effects.

A′-movement if one departs from a binary classification of movement types.

Another interesting observation that bears on the nature of scrambling is provided by Déprez (1989). She points to the fact that Hindi has long-distance scrambling (LDS) in addition to sentence-internal srambling (SIS) that we have been discussing. One property that distinguishes them is the fact that LDS displays weak crossover effects. Compare (26b) above with (29):

(29) *kis-ko$_i$ uskii$_i$ maaN soctii hai ki anu t_i
whom his mother thinks that Anu
pasand kartii hai
likes
'Who is such that his mother thinks that Anu likes him?'

Déprez then notes a further property that distinguishes the two. SIS allows floating quantifiers in any of the positions to which NP's can be scrambled:

(30) a. raam-ne mohan-ko [saarii kitaabeN] lautaa diiN
Ram-ERG Mohan-DAT all books returned
'Ram returned all the books to Mohan.' [*S IO DO V*]

b. raam-ne kitaabeN$_i$ mohan-ko [saarii t_i] lautaa diiN
[*S DO IO V*]

c. kitaabeN$_i$ raam-ne mohan-ko [saarii t_i] lautaa diiN
[*DO S IO V*]

d. kitaabeN$_i$ raam-ne [saarii t'_i] mohan-ko t_i lautaa diiN
[*DO S IO V*]

She follows Sportiche (1988) in analysing the quantifier as being generated inside the NP with subsequent movement of the head leaving the quantifier stranded.[13] The data in (30) shows that the quantifier may travel with the head and be stranded at any position to which the NP scrambles.

The point she establishes is that stranding of quantifiers is not a property of A′-movement but of A-movement, as demonstrated by the following English examples:[14]

(31) a. *The children, who$_i$ I will have [all t_i] met before the end of this week, ...
b. The boys$_i$ appear [all t_i to have left].

In (31a), the relevant movement is that of the relative *wh* which leaves

[13]See Guilfoyle et al. (1992), however, for a different view of floating quantifiers.
[14]As noted by Sportiche (1988) and Déprez (1989), however, a quantifier cannot be stranded in its base position: *The boys$_i$ were defeated [all t_i]

the quantifier *all* stranded. Since the movement involved is uncontroversially A′-movement, it can be assumed that quantifier stranding is not licensed by A′-movement. In contrast, (31b) shows that quantifier stranding is possible with raising.

Déprez admits, however, that the evidence from Hindi supporting the idea that quantifier stranding is not a property of A′-movement is not very clear. But if LDS is an instance of A′-movement, as shown by (29), she argues that it should not allow quantifier float. Example (32) shows this to be true:[15]

(32) a. [raam samajhtaa hai ki [phal$_i$ anu jaantii hai
Ram believes that fruit Anu knows
[ki [saare t_i] mohan khaa gayaa]]]
that all Mohan ate
'Ram believes that Anu knows that Mohan ate all the fruit.'

b. [phal$_i$ raam samajhtaa hai ki [t'_i anu jaantii hai
[ki [saare t_i] mohan khaa gayaa]]]
*[phal$_i$ raam samajhtaa hai ki [[saare t'_i]$_i$ anu jaantii hai
[ki t_i mohan khaa gayaa]]]

In (32a) *saare phal* 'all fruit' moves to presubject position as an instance of SIS. From there *phal* 'fruit' moves as an instance of LDS leaving *saare* 'all' stranded in the lower clause. In (32b) it moves further up and the sentence is still fine. In (32c) the whole NP moves via LDS first to the presubject position in the intermediate clause. When the head moves further up, leaving the quantifier in the intermediate position, the result is ungrammatical. This shows that positions that are involved in SIS are different from positions that are involved in LDS. According to Déprez, LDS necessarily involves adjunction to IP, while SIS can be movement into Spec of functional projections. The conclusion she draws is that movement to Spec of functional projections has something in common with movements like raising. In this, her proposal is similar to Mahajan's but there is an important respect in which the two proposals differ. Mahajan allows for only two types of landing sites, L-related or non L-related (A and A′, loosely speaking), but Déprez argues for a ternary partition of positions. Typical instances of A′-movement are to [−H(ead)R(elated), −Case] positions and typical instances of A-movement to [+HR, +Case]. Turning to scrambling, she argues that LDS is movement of the first kind. SIS, on the other hand, she suggests can be movement of the second type or of a third type, namely movement to [+HR, −Case] positions, whose

[15](32) is diffferent from the examples in Déprez. I think that (32) makes her point more clearly than her examples (26) on p. 136.

properties are ambiguous. In this her position is not very different from Webelhuth (1989). Note that once a mixed position is allowed, scrambling does not have to be treated as A-movement just because it does not display all the properties of standard instances of A′-movement.

In this section we have looked at two properties that distinguish scrambling from A′-movements like wh-movement. We also noted that there seems to be a growing consensus that a binary classification of movement types may be too coarse-grained to account for the phenomenon of scrambling. The precise characterization of this third type remains, I think, an open question but to discuss the various proposals lies outside the scope of this paper.

6 Conclusion

In conclusion, let us take stock of the empirical data relevant in determining the type of movement involved in scrambling. It turns out on close scrutiny that there are two phenomena differentiating sentence-internal scrambling from standard types of A′-movement, namely the absence of weak crossover effects and the ability to strand quantifiers. If there are only two types of movement, A and A′, scrambling would have to be considered A-movement. As we have seen, however, analysing scrambling as A-movement makes the incorrect prediction that scrambled objects will behave like arguments with respect to BT. A third type of movement, one which behaves like A′-movement for binding but not for weak crossover and quantifier float, is clearly needed to describe the phenomenon of scrambling.

Acknowledgements

I am indebted for helpful comments and discussion to Maria Bittner, Viviane Déprez, Jane Grimshaw, Ken Safir, and Kashi Wali. I am also grateful to two anonymous reviewers whose extensive comments led to a substantively improved version of the original paper. All remaining errors and omissions are my own.

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