CONCLUSION

In this chapter, I have explored the semantics of questions and argued that questions denote sets of propositions, though echo and D-linked multiple wh questions may denote sets of sets of propositions. Question-embedding verbs uniformly combine with sets of propositions via Ans(Q). In the case of extensal verbs, Ans(Q) picks out the maximally true proposition. The truth requirement is not built into the question denotation but is introduced by Ans(Q).

A possible answer to a question is constrained by the number marking on the wh expression. Single wh questions with singular morphology denote propositions naming atomic individuals while those with plural morphology denote propositions with plural individuals. This accounts for uniqueness/maximality effects. Multiple wh questions encode functional dependencies. Each possible answer exhaustively pairs the members of the domain of the function. In the absence of functional dependencies a multiple wh question denotes propositions naming single pairs of individuals, yielding the REF-Q reading. While list answers involve functional dependencies in the case of multiple wh and questions with quantifiers, they derive from a cumulative reading of individual answers in the case of questions with plural definite.

I have also argued against the standard view that long-distance answers indicate matrix scope of embedded wh-in-situ and presented alternatives that interpret all wh expressions in the clause where they occur at S-structure. The apparent conflict between the absence of wide scope readings of wh in-situ and the existence of long-distance lists in a language like Hindi is thereby resolved. I have argued that these alternatives are needed cross-linguistically by presenting evidence from a number of languages that is problematic for standard approaches. This approach to long-distance lists appeals to universal semantic properties and is predicted to apply universally.

To sum up our investigation into Hindi questions, we have seen, in the case of scope-marking as well as long-distance list answers, that the heuristic of using specification of values as an indicator of syntactic scope is flawed. In each of these cases, principled alternatives to matrix scope assignment of embedded wh were shown to provide greater empirical coverage. Specification of values in the answer has, however, been standardly used to establish syntactic scope. This has proved particularly powerful in the case of wh in-situ, where it is taken as evidence of LF movement in violation of subjacency. The approach argued for here shows that a reappraisal of claims about the nature of LF is needed and we will return to this issue in Chapter VII. The next two chapters enlarge the domain of inquiry by focusing on relative clauses in Hindi and issues of locality having to do with them.

CHAPTER V

RELATIVIZATION STRUCTURES IN HINDI

INTRODUCTION

We now turn to a consideration of relativization structures in Hindi, which are distinguished by the fact that relative clauses readily occur at the periphery of the main clause. As mentioned in chapter I, central to the issue of locality here is the relation between the adjoined relative clause and the main clause DP with which it is construed. The basic thesis I advance is that there are two different types of relativization involved. While right-adjointed relatives are noun modifiers, left-adjointed relatives are generalized quantifiers. Though they enter into different relations with the nominal in the main clause, locality is respected in each case.

I begin this chapter by introducing Hindi relativization structures, noting their implications for a compositional semantic interpretation. I then present syntactic and semantic evidence distinguishing left-adjointed and right-adjointed relatives. I show that the properties of right-adjointed relatives follow from the standard analysis of relative clauses as originating inside the DP they modify and optionally extraposing to the right. Using the difference between left-adjointed and right-adjointed relatives as evidence, I argue for an alternative syntactic analysis of left-adjointed relatives in which they are base-generated in adjoined positions. I demonstrate that such relative clauses are not interpreted as noun modifiers but as operators that A-bind a variable.

1 This chapter and the next contain some material that was previously published in Srivastav (1991d). The specifics of the interpretation have changed, particularly with respect to the analysis of multiple correlatives. I am indebted to Barbara Partee, Peter Hook, Kashi Wall and Maria Pistore for many helpful comments.
1. ADJOINED RELATIVE CLAUSES

1.1. Hindi in the Typology of Relativization

Hindi relativization structures are known in typological literature by the name of correlatives (see, for example, Keenan 1985, Downing 1973, Andrews 1985). The chief characteristic associated with correlative constructions is the possibility of having the relative clause at the periphery of the main clause. Other languages known to have correlatives are Hindi (Raman 1973, Bach and Cooper 1978, Cooper 1979) and Walpiri (Hale 1976, Larson 1982) as well as other South Asian languages like Bangla (Dah, Gupta 1980, Bagchi 1994) and Marathi (Junghare 1973 and Wall 1982). The Hindi examples in (1) illustrate the basic features of relativization in these languages. The relative clause appears in italics and the noun phrase to which it is linked is in boldface:

(1) a. jo khaRii hai vo laRkii lambii hai
   who standing be-PR that girl tall be-PR
b. vo laRkii lambii hai jo khaRii hai
   that girl tall be-PR who standing be-PR
c. vo laRkii jo khaRii hai lambii hai
   that girl who standing be-PR tall be-PR
   "The girl who is standing is tall."

In (1a) the relative clause precedes the head, in (1b) and (1c) it follows it. In (1b) the relative clause occurs after the verbal complex and must be analysed as adjoined to IP or CP. It is not immediately obvious whether (1a) instantiates a similar adjunction on the left since the word order is also compatible with an analysis in which the relative...

2 Hindi also allows non-finite relative clauses, which precede their heads, as demonstrated below:

(i) maIN-e maI nee lue ek laRkii ko delka
   dance PCPL one girl-A see-P
   "I saw a dancing girl" (= a girl who was dancing)
(ii) maIN-e ek maI nee lue laRkii ko delka
    one dance PCPL girl-A see-P
    "I bought a dancing doll" (= a doll that can dance)

The relative clauses here agree in number, gender and case with the head. Presumably, the position to the left of the head is a case position and this bars finite relatives from appearing there. I do not discuss these relatives here.

2 An intonation break between the clauses may be needed to make extraposition structures completely acceptable in English. See McCawley (1992) for some other observations about the difference in extraposition possibilities in the two languages.
the relative clause cannot occur in other positions is shown by the following examples:\footnote{It is harder to show this effect for left-adjointed relatives. I will establish its peripheral position on the basis of other evidence in the discussion to follow.}

(5) a. *vo lāṛkī† lambī jo khaṛii hai hai
   that girl tall who standing be-PR be-PR
   "The girl who is standing is tall."

b. *vo lāṛkī† lambī jo geyii hai
   that girl tall who leave-P be-PR
   "The girl who left is tall."

We know from (4b) that it is possible for a DP to intervene between the main verb and the auxiliary. (5a) shows that a relative clause cannot occur in this position. (5b) establishes that this is not due to any awkwardness caused by the repetition of the auxiliary hai but is a general feature of right-adjointed relatives. (5d) demonstrates the same fact with respect to the possibility of placing a relative clause modifying an indirect object between the direct object and the verb:

(6) a. anū us lāṛkī† ko
   Anū that girl-D
   jo vahaaN khaṛii hai kitaab degii
   book give-F who there standing be-PR

b. anū kitaab us lāṛkī† ko
   Anū book that girl-D
   jo vahaaN khaṛii hai degii
   who there standing be-PR give-F

c. *anū us lāṛkī† ko kitaab
   Anū that girl-D book
   jo vahaaN khaṛii hai degii
   who there standing be-PR give-F
   "Anū will give the book to the girl who is standing there."

(6a) instantiates what is taken to be the basic word order for triadic verbs in Hindi. (6b) shows that the indirect object can occur after the direct object. (6c) establishes that it is not possible to move just the relative clause to this position. If the adjoined position of the relative clause in Hindi were due to scrambling, we would expect greater freedom of positioning than seen in (5)-(6) since scrambling allows constituents to move to non-peripheral sites.

A somewhat indirect argument against the view that the variation in (1) is a reflex of scrambling comes from non-restrictive or appositive relatives. As in English, non-restrictive relatives in Hindi can modify proper names and are accompanied by an intonational break. Unlike restrictive relatives, however, these relatives must be adjacent to the head:

(7) a. *jo khaṛii hai anū lambī hai
   who standing be-PR Anū tall be-PR
   who standing be-PR
   "Anū, who is standing, is tall."

Non-restrictive relatives, we see, do not have the same options as restrictive relatives. This shows that even though Hindi manifests a great deal of word order variation, there are structures that are quite restricted in this respect (see also Mohanan 1990 and Mahajan 1990 for further discussion on scrambling restrictions). Thus it does not come as a surprise that the position of restrictive relatives, though freer than that of non-restrictive, is still constrained.

I have established so far that relativization in Hindi instantiates adjunction structures. That is, the relative clause and the DP it is linked to do not form a constituent at S-structure. The question that I want to explore next is the implications of this syntactic analysis for interpretation.

1.2. Adjoined Relatives as Noun Modifiers

Previous approaches to the phenomenon have assumed that adjoined relative clauses are noun modifiers, analogous to restrictive relative clauses in languages like English. In section 1.3 I will present data to show that this assumption needs to be revised, but before doing that I want to outline how adjoined relative clauses can be interpreted as noun modifiers (cf. discussion in Chapter 1, section 2.1). The standard interpretation of relative clauses treats the wh expression as a lambda operator that abstracts over the position marked by its trace. This yields a set-denoting expression that can then interact with the set denoted by the head (Partee 1975). We can illustrate with an example like (1c) in which the head and the modifier are adjacent.
In order to interpret adjoined relatives we have to determine whether the relative clause originates inside the DP and is moved via extraposition or whether it is base-generated in the adjoined position. Let us consider the extraposition option first, which has been proposed for Hindi by Verma (1966), Kachru (1973) and (1978), Subbarao (1984) and Bains (1989). Although these studies do not provide an explicit semantics, it is easy to see how the desired interpretation can be derived. Let us demonstrate with (1b), the case of right-adjoined relativization:

5 I am ignoring for the moment the fact that the main clause DP undergoes QR. This will be discussed in section 2 in connection with the right roof effect associated with extraposition.

6 I do not assume syntactic reconstruction though that would yield equivalent results in the case of relative clauses. But in Chapter II we saw that syntactic reconstruction leaves open the possibility of subsequent LF wh movement, which does not occur in Hindi.
LOCALITY IN WH QUANTIFICATION

The spirit of compositionality in that it allows expressions to be interpreted in positions for which there is no syntactic motivation. Of course, such a weakening can be justified if syntactic and semantic considerations warrant it.

We see, then, that there is no problem in interpreting adjunction structures in terms of noun modification. In the next section, however, I point out some differences between relative clauses adjoined to the left and those adjoined to the right, which raise doubts about the fundamental assumption that relativization structures uniformly involve noun modification.

1.3. Differences between Relative Clauses

An important difference between left-adjointed and right-adjointed relatives has to do with headiness, by which I mean the presence or absence of the common noun in the relative clause and the main clause. It has been observed that in left-adjointed structures both DPs can be realised with a common noun.\(^7\) Right-adjointed structures, however, do not allow the relative clause to contain the common noun.

\(^7\) There is, of course, a fundamental problem with the adjoined clause approach which has not been sufficiently addressed by its proponents. There is no explanation for the fact that if a relative clause occurs inside the main clause it

RELATIVIZATION IN HINDI

must be adjacent to the head, as shown by the grammaticality of (1c) or (4c) and the ungrammaticality of (5).

\(^8\) In the discussion of scope marking structures I analyse the finite complement as adjoined to CP at D-structure but I interpret it as the restriction of the wh in the matrix, using the implicit variable T. Though the interpretation is compositional in the strict sense, it too allows interpretation to be reconstituted in lower positions. Note that an alternative analysis in terms of extraposition is feasible for scope marking and has, in fact, been proposed by Heberger (1994). The reason for not adopting the extraposition analysis in scope marking was because it would leave open the explanation of the negative island effects. If an alternative explanation were available for the negation facts, strict compositionality could be maintained in the analysis of scope marking by using the trace of the extraposed CP, instead of T, to interpret the structure. One difference between the two cases that may be relevant is that restriction on quantifiers (what T stands for) is obligatory while noun modification (what R stands for) is optional.

\(^9\) In Kachru (1973, 1978) sentences like the second one in (9a), that is, those with a common noun in both clauses, are represented with a question mark. I consider the first sentence basic and, in some sense, more natural than the other two. All three, however, are acceptable and need to be accounted for.
In other words, the relative clause in (9a), but not the one in (9b), can be internally headed:

(9a) jo *laRkiN khaRii hai* vo lambi hai
which girl standing be-PR that girl tall be-PR
jo laRkiN khaRii hai vo *laRkiN lambi hai*
which girl standing be-PR that girl tall be-PR
jo khaRii hai vo *laRkiN lambi hai*
who standing be-PR that girl tall be-PR
"Which girl is standing, she is tall."

b. vo *laRkiN lambi hai* jo khaRii hai
that girl tall be-PR who standing be-PR
*vo *laRkiN lambi hai* jo laRkiN khaRii hai*
that girl tall be-PR which girl standing be-PR
*vo lambi hai* jo laRkiN khaRii hai
she tall be-PR which girl standing be-PR
"The girl who is standing is tall."

A second difference between the two types of relatives has to do with a demonstrative requirement in left-adjointed structures. Subbarao (1984:13) observes that if the main clause DP is indefinite, the relative clause can only occur to the right.

(10a) *jo *laRkiyaN khaRii haiN* do lambi haiN
which girls standing be-PR two tall be-PR
"Which girls are standing, two are tall."

10 From this point on, I will translate left-adjointed relatives in a way that distinguishes them from ordinary relativized structures. Though these translations do not sound natural in English, they preserve the essential properties of the Hindi construction.

11 It is possible for the main clause DP to be a null pronoun, as in (i):

(i) jo *laRkiN khaRii hai* [pro] lambi hai
which girl standing be-PR tall be-PR
"Which girl is standing, (she) is tall."

This is not surprising, given that Hindi is a pro-drop language. However, it is well-known that there are constraints on pro-drop having to do with semantic recoverability (Huang 1984 and Rizzi 1986). I assume that pro-drop is not possible in the case of vo do "those two" since the meaning cannot be recovered from [pro] do "two" and the structure in which it occurs.

b. do *laRkiyaan lambi haiN jo khaRii haiN*
two girls tall be-PR who standing be-PR
"Two girls who are standing are tall."

The only way to express (10) in a left-adjointed structure is to use a participle in the main clause. The participle provides the demonstrative un and makes the main clause DP definite:

(10c) jo *laRkiyaan khaRii haiN un-meN se do lambiN haiN*
which girls standing be-PR them-PART two tall be-PR
"Which girls are standing, two of them are tall."

Similarly, compare (10a)–(10b) with (11) in which a demonstrative has been added to the main clause DP. The left-adjointed and the right-adjointed relative are both acceptable now:

(11) a. jo *laRkiyaN khaRii haiN ve do lambiN haiN*
which girls standing be-PR those two tall be-PR
"Which girls are standing, those two are tall."

b. ve do *laRkiyaan lambiN jo khaRii haiN*
those two girls tall be-PR who standing be-PR
"The two girls who are standing are tall."

Subbarao’s observation that left-adjointed relatives are compatible only with definite DP’s, though essentially correct, requires one further modification. In Hindi, bare noun phrases can function as definites (see Verma (1966) and Porterfield and Srivastav (1985) for discussion) but such DPs are not possible in left-adjointed structures, as brought to my attention by Geoff Pullum (personal communication):

(12a) *jo *laRkiN khaRii hai* laRkiN lambi hai
which girl standing be-PR girl tall be-PR
"Which girl is standing, she is tall."

b. *laRkiN lambi hai jo khaRii hai*
girl tall is REL standing is
"The girl who is standing is tall."

12 Heck (1989) considers (11a) ungrammatical. Although speakers may prefer the main clause to have ve dona "both those" in place of ve do "those two", both are possible.
It would seem, then, that the restriction on the main clause DP in left-adjoined structures is stricter than definiteness; the DP must contain a demonstrative.

There is, however, a small class of determiners that seems not to require the demonstrative with left-adjoined relatives. These are, roughly speaking, the universals:

(13) a. jo laRkiyana khaRii haiN which girls standing be-PR
    sab/dono/tiino lambii haiN all/both/all three tall be-PR
    "Which girls are standing, all/both/all three are tall."

b. sab/dono/tiino laRkiyana lambii haiN all/both/all three girls tall be-PR
    jo khaRii haiN who standing be-PR
    "All/both/all three girls who are standing are tall."

Note though that these determiners may cooccur with the demonstrative vo, without a difference in meaning. That is, sab/v/e sab, dono/v/e dono, tiino/v/e tiino show the kind of alternation we see between both/both the in English. One could very well analyze (13a) as having a null demonstrative in it, keeping intact the generalization that left adjunction requires a demonstrative in the main clause DP.

It is worth mentioning in this connection another determiner that may occur in left-adjoined structures without an overt demonstrative. The DP in (14a) has the determiner har ek "each/" every which cannot be analyzed as having a null demonstrative since ve har ek "those every" is unacceptable. It can, however, be analyzed as having a null partitive un-meN-se har ek "them-PART each one". This determiner is particularly interesting because it brings out yet another difference between left-adjoined and right-adjoined relatives:

(14) a. jo laRke khahte haiN (un-meN-se) which boys standing be-PR them-PART
    har ek meraa chaar hai each one my student be-PR

13 I am not sure whether har ek is like "every" or "each". What is of relevance here is that it is clearly singular.

RELATIVIZATION IN HINDI 163

b. *jo laRkaa khaRaa hai (un-meN-se) which boy standing be-PR them-PART
    har ek meraa chaar hai each one my student be-PR
    "Which boys are standing, each one is my student."

Although har ek is a singular determiner, the left-adjoined relative is required to have plural morphology, as shown above. In contrast, the right-adjoined relative must have singular morphology, as shown in (15):

(15) a. har ek laRkaa meraa chaar hai each one boy my student be-PR
    jo khaRaa hai who standing be-PR
    "Each boy who is standing is my student."

Finally, a pronoun inside a left-adjoined relative cannot be bound by arguments inside the main clause while those in right-adjoined relatives can (Maria Bittner, personal communication):

(16) a. *jis laRke-se vo, sahse pohle mili hai which boy-INS she of-all before meet-PR
    har laRki, us-se shaadit kartii hai every girl be-INS marriage do-PR
    "Which boy she meets first, every girl marries him."

b. har laRki, us laRke-se shaadit kartii hai every girl that boy-INS marriage do-PR
    jis-se vo, sahse pohle mili hai who-INS she of-all before meet-PR
    "Every girl marries the boy she meets first."

Related to this is the fact that a pronoun in the main clause must be disjoint in reference with a name in the right-adjoined relative but may corefer with one in the left-adjoined relative:
LOCALLITY IN WH QUANTIFICATION

(17) a. anu-ne, vo kitaab tumhaare liye bheji hai
    Ana-E that book you-G for send-PRF-PR
    jo us-ko, ravi-ne diti thi
    which she-D Ravi-E give-PRF-P
    "Ana has sent that book for you which Ravi had given
    her."

b. us-ne, vo kitaab tumhaare liye bheji hai
    she-E that book you-G for send-PRF-PR
    jo ana-ko, ravi-ne diti thi
    which Ana-D Ravi-E give-PRF-P
    "She has sent that book for you which Ravi had given
    Ana."

(18) a. jo kitaab us-ko, ravi-ne diti thi
    which book she-D Ravi-E give-PRF-P
    anu-ne, vo kitaab tumhaare liye bheji hai
    Ana-E that book you-G for send-PRF-PR
    "Which book Ravi had given her, Ana has sent that book
    for you."

b. jo kitaab ana-ko, ravi-ne diti thi
    which book Ana-D Ravi-E give-PRF-P
    us-ne, vo kitaab tumhaare liye bheji hai
    she-E that book you-G for send-PRF-PR
    "Which book Ravi had given Ana, she has sent that book
    for you."

We have seen here that that there are sharp differences in the
behavior of left-adjointed and right-adjointed relatives with respect to
the demonstrative requirement, agreement with singular determiners,
bound variable and disjunct reference facts. Standard analyses of
Hindi correlatives in terms of extraposition or adjunction focus on a
set of data that does not bring out these distinctions. As such, they
attempt a uniform analysis for what is clearly not a uniform
phenomenon. In the next sections I propose separate syntactic and
semantic analyses for right-adjointed and left-adjointed relatives.
Syntactically, right-adjointed relatives will be shown to originate inside
the DP and undergo extraposition. Left-adjointed relatives, on the
other hand, will be treated as base-generated in adjointed positions.
Semantically, right-adjointed relatives will be shown to involve noun
modification while left-adjointed relatives will be shown to behave like
A* operators. I will first develop the account for right-adjointed
relatives in section 2 before turning to left-adjointed relatives in section
3.

2. RIGHT ADJUNCTION AND NOUN MODIFICATION

2.1. Embedded and Extraposited Relatives

If we consider the differences listed in section 1.3. we notice that in
each case the behavior of the right-adjointed relative is the expected
one while the behavior of the left-adjointed relative is unusual. That is,
the right-adjointed relative behaves like an ordinary restrictive relative.
Now, the most plausible analysis for right-adjointed relatives in English
is one where they are generated inside DP and optionally extraposed.
A similar analysis can be posited for Hindi on the basis of correlations
between right-adjointed relatives and embedded relatives of the kind
seen in (1c). Towards this end, consider the behavior of embedded
relatives with respect to the demonstrative requirement, agreement with
singular determiners, bound variable and disjunct reference facts.

(19) shows that embedded relatives do not allow internal heads.
They pattern with the right-adjointed relative in (9b) rather than with
the left-adjointed relative in (9a) in not allowing a common noun
inside the relative clause:

(19) vo laRkii jo khaRii hai lambii hai
    that girl who standing be-PR tall be-PR
    vo laRkii jo laRkii khaRii hai lambii hai
    that girl which girl standing be-PR tall be-PR
    vo vo laRkii khaRii hai lambii hai
    that which girl standing be-PR tall be-PR
    "The girl who is standing is tall."

Similarly, (20) shows that embedded relatives occur with indefinite
DPs as well as with bare DPs. Again, this is like the right-adjointed
relatives in (10b) and (12b) and unlike the left-adjointed relatives in
(10a) and (12a):

(20) a. do laRkiiyaanN jo khaRii haiN lambii haiN
    two girls - who standing be-PR tall be-PR
    "Two girls who are standing are tall."

b. laRkii jo khaRii hai lambii hai
    girl who standing be-PR tall be-PR
    "The girl who is standing is tall."

"Two girls who are standing are tall."

"The girl who is standing is tall."
Further, when the determiner in the main clause is singular, embedded relative clauses also have singular morphology. That is, they align with (15) rather than (14):

(21) a. har ek laRkaa jo khaaR hai meraa chaatr hai each one boy who standing be-PR my student be-PR
   b. *har ek laRkaa jo khaaRe haiN meraa chaatr hai each one boy who student be-PR my standing be-PR
   “Each boy who is standing is my student.”

Embedded relatives also allow pronouns to be bound by matrix clause quantifiers, on par with (16b) and unlike (16a):14

(22) har laRkii, us lRke-se ji-se vo, sabse pahle every girl that boy-JNS who-INS she of-all before miltii hai shaddii kartii hai meet-PR marriage do-PR
   “Every girl marries the boy she meets first.”

And, finally, a name inside an embedded relative must be disjoint in reference to a pronoun c-commanding the head DP. This is again like (17) and not like (18):

(23) a. anu-ne, vo kitaab jo us-ko, ravi-ne dii thi Ann-E that book which she-D Ravi-E give-PRF-P tumhaare liye bheji hain you-G for send-PRF-PR
   “Anu has sent that book for you which Ravi had given her.”
   b. us-ne, vo kitaab jo ana-ko, ravi-ne dii thi she-E that book which Ana-D Ravi-E give-PRF-P tumhaare liye bheji hain you-G for send-PRF-PR
   “She has sent that book for you which Ravi had given Ana.”

14 In the case of DP’s with overt case-marking, extrapolation is preferred over embedding but embedded relatives are not marginal or ungrammatical.

Note that none of the properties under discussion are at all surprising for embedded relatives. We know, for example, from languages like English that restrictive relative clauses do not have internal heads. I will suggest for now that wh expressions with common nouns are R-expressions while bare wh expressions are pronominal. (19), for example, would have the following structure:

(24) [that girl, [who*which girl, is standing]]

Cointlexification between the head and the wh operator will lead to a violation of Principle C in the case of an internally-headed relative clause but not otherwise. In Chapter VI, the semantics of internally-headed relatives will also be argued to be incompatible with the semantics of noun modification. Thus the distribution of the common noun in restrictive relatives follows from syntactic and semantic principles.

The fact that embedded relatives are insensitive to the type of the determiner as well as to its presence follows from the fact that relative clauses take scope at the level of the common noun (cf chapter 1, section 2.1. and section 1.2 above). It then does not matter what type of head DP is involved. (20a)-20b are interpreted as (25a)-25b respectively:15

(25) a. [∃x([two(x) ∧ *girl(x) ∧ stand(x) ∧ tall(x)]
   b. tall’(x∧wo(x) ∧ *girl(x) ∧ stand(x))]

The difference between the two sentences is simply in uniqueness requirements. (25a) makes an assertion about a sum individual with two parts that is a girl and is standing, while (25b) makes an assertion about a unique sum individual with these properties.

Finally, the structure of embedded relativization transparently accounts for agreement, bound variable and disjoint reference facts. In (21), for example, the relative clause is expected to show singular morphology since it is in the scope of the singular determiner har ek. The bound variable reading of the pronoun inside the relative clause in (22) is also expected since the subject c-commands the object DP and can bind elements inside it. Similarly, (23a) is

15 Recall that we have adopted a theory in which the domain of entities includes atomic as well as sum individuals. Numerals like two, for example, can therefore be treated as predicates. two(x) will be true if x is a sum of at least two atomic individuals. Note that indefinites are treated as generalised quantifiers while definite are treated as individual-denoting (see Bittner 1994a, 1994b for further discussion).
acceptable because there is no violation of Binding Theory but (23b)
is ruled out because the R-expression is coindexed with a c-
commanding pronoun.

Given the parallel behavior of embedded and right-adjointed
relatives, it seems quite plausible to treat Hindi right-adjointed
relatives on a par with English right-adjointed relatives as being derived from
embedded relatives via extraposition. Note that this provides a partial
explanation for the differential behavior of left-adjointed relatives. It
is well accepted that extraposition to the left is not possible in
languages like English. If this is a universal, as claimed by Baltin
(1985), Hindi left-adjointed relatives could not be derived by
extraposition. They must then be base-generated in adjoined
position. We thus come to the conclusion that Hindi left-adjointed and
right-adjointed relatives have different structures. This is illustrated
below:

(26) a. Left-adjointed

\[ \text{CP} \rightarrow \text{IP} \]
\[ \text{DP} \rightarrow \text{NP} \]
\[ \text{VP} \rightarrow \text{IP} \]
\[ \text{subject: } \text{laRka \ haj \ hati} \]
\[ \text{which: girl standing be-PR} \]
\[ \text{object: lambi hai} \]
\[ \text{she tall be-PR} \]

b. Right-adjointed

\[ \text{IP} \rightarrow \text{CP} \]
\[ \text{DP} \rightarrow \text{NP} \]
\[ \text{NP} \rightarrow \text{IP} \]
\[ \text{VP} \rightarrow \text{IP} \]
\[ \text{subject: laRka \ hati} \]
\[ \text{who standing be-PR} \]
\[ \text{object: tall be-PR} \]

A question that arises, of course, is why extraposition to the left
should be prohibited in natural language. Guerel (1980) suggests
that this is ruled out due to semantic considerations, a constituent
adjointed to the left always being interpreted as a topic. It is certainly
ture that the relative clause in a correlative can, in many cases, be

The problem of blocking leftward extraposition is, of course, not
specific to Hindi and I expect that whatever account works in the
general case will transfer over to Hindi. The point I am trying to
make here takes as the null hypothesis the view that Hindi, like other
languages, allows extraposition to the right but disallows it to the left.
The relativization structures in (26) would then be the expected ones.
The differential behavior of left-adjointed relatives seen in section 1.3
could be taken as providing confirmation of this null hypothesis. If
of course remains to be shown why left-adjointed relatives display the
particular behavior they do and I will take up this task in section 3
after discussing some further properties of Hindi embedded and
extraposed relatives.

In concluding this section, let me make a terminological
distinction. Note that a special term such as correlative is not needed
to refer to right-adjointed relatives if they are typologically indistinct
from regular restrictive relatives. From this point on I will therefore
use the term to refer only to the structurally distinct left-adjointed
structures.

16 While this account seems quite plausible it will not hold up if WCO is
taken to be a leftness effect and languages with left-branching relative clauses
also do not allow leftward extraposition.
2.2. The Right Roof Effect in Extraposition

The structure of restrictive relativization that I have suggested above for Hindi is not particularly controversial. In fact, my main claim is that Hindi does not justify any modification to analyses of the phenomenon based on restrictive relativization in languages like English. I should mention, however, that it has been claimed by Subbarao (1984) and McCawley (1992) that Hindi right-adjoined relatives differ from English extraposed relatives in not showing Ross’s Right Roof Effect. The aim of this section is to put in perspective the data presented in support of this position and show that they do not warrant a substantive distinction between restrictive relativization in the two languages.

Let us begin by considering a simplified version of a Hindi example given by Subbarao to show absence of the Right Roof Effect:

(28)

\[
\begin{align*}
\text{IP} & \\
\text{NP} & \\
\text{AdvP} & \\
\text{VP} & \\
\text{Ih} & \\
\text{un liRkOn-ko} & \\
\text{jo} & \\
\text{dariwasaa band kiyaan} & \\
\text{those boys-O leave-INF} & \\
\text{door close-P} & \\
\text{who come-PRF-P} & \\
\text{jo aaye the} & \\
\text{IP} & \\
\text{CP} & \\
\end{align*}
\]

In (28) the relative clause originates inside the adverbial phrase and is adjoined to matrix IP, as opposed to the adverbial phrase. Subbarao claims that this is a case of attachment to a superordinate clause, in violation of the right roof constraint. McCawley gives the following examples to make the same point:

(29) a \text{un jhuToN-ko dohranaa buraa bai} \\
those lies-A repeat-INF bad be-PR \\
\text{jo raam-ne tumhe bataaye the} & \\
which Ram-E you-D tell-PRF-P \\
\text{to repeat the lies that Ram told you is bad.} & \\

In (30) the overt subject of the relative clause is the pronoun of the relative clause.

b. aagar raam sitaa-ko vo pati dikhaya ye vo \\
if Ram Sita-D that letter show-SUBJ she \\
bhaag jaaya gii jo run-Ne likhaa \\
run-away-P which you-E write-P \\
\text{if Ram shows Sita the letter that you wrote, she will run away.} & \\

The thrust of the arguments here is that given that Hindi right-adjoined relatives do not obey known constraints on extraposition, they warrant a separate treatment from ordinary relativizers. One possibility would be to have them base-generated in adjoined position (see also Dwivedi 1994).

Before assessing the data in (28)-(29), let us adopt a specific analysis of the right roof effect. In May (1985) it is proposed that an extraposed relative clause must be governed by its head at LF. The head, being a quantified DP, is subject to QR which is a local operation. At LF, then, the head and the relative clause will be dominated by all the same maximal projections and there will be no intervening maximal projection if extraposition is to a local domain. If the relative clause is adjoined higher, the head will not be able to e-command it. Thus proper government will not obtain unless extraposition obys the right roof constraint. As May shows, this explains the fact that in a sentence like (30) the pronoun and the proper name are necessarily interpreted as disjoint in reference. The requirement of government by a head prevents the relative clause from adjoining to the matrix IP, a position that would not interfere with the coreference under discussion:

(30) \text{Ipa told beri, lpy that the concert was attended by many people tii last year lpy, who made Mary nervous.} & 

Now, if the obligatory disjoint reference in (30) is evidence of the right roof effect, it is easy enough to test whether relative clause extraposition in Hindi displays this effect. Consider (31) which is structurally parallel to (30):

\[\text{un liRkOn-ko dohranaa buraa bai} \]

\[\text{those lies-A repeat-INF bad be-PR} \]

\[\text{jo raam-ne tumhe bataaye the} \]

\[\text{which Ram-E you-D tell-PRF-P} \]

\[\text{to repeat the lies that Ram told you is bad.} \]

\[\text{un liRkOn-ko dohranaa buraa bai} \]

\[\text{those lies-A repeat-INF bad be-PR} \]

\[\text{jo raam-ne tumhe bataaye the} \]

\[\text{which Ram-E you-D tell-PRF-P} \]

\[\text{to repeat the lies that Ram told you is bad.} \]

\[\text{un liRkOn-ko dohranaa buraa bai} \]

\[\text{those lies-A repeat-INF bad be-PR} \]

\[\text{jo raam-ne tumhe bataaye the} \]

\[\text{which Ram-E you-D tell-PRF-P} \]

\[\text{to repeat the lies that Ram told you is bad.} \]

17 The relevant definition of e-command here is one in which the first maximal projection rather than the first branching node counts.
(31)  [I think she love the man who knows my friend.]

(32)  baice khele raha the jis-kii awasaa va rahib thi children play-PROG-P who-G sound come-PROG-P

The relative clause here obviously needs a plural antecedent but there is no such noun phrase in the main clause. This phenomenon, traditionally treated as right node raising, is also present in Hindi, as shown by the possibility of the Hindi version of (33):\textsuperscript{18}

(34)  ek andmii aaya aur ek orurat cali gaiyi a man come-P and a woman leave-P

While examples like (34) and (32) are part of the grammar of Hindi, a theory of noun modification cannot be based on them. As in English, they do not represent the core case of noun modification. They only show that it may be possible to process sentences even in the absence of a strict syntactic relation, as long as a likely nominal can be inferred. As such, I will take it as established that relative clauses acting as noun modifiers are constituents of the DP at D-structure. The difference between Hindi and English seems to be that Hindi tends to extrapose relative clauses much more readily than English. This would tie in with the general tendency in Hindi for finite clauses to occur at the right periphery of the clause.

3. LOCALITY IN CORRELATIVES

3.1. Variables inside Noun Phrases

We have established so far that Hindi right-adjointed relatives display the properties standardly associated with restrictive relativization. That is, they are generated inside the noun phrase they modify and extraposed to the right. We have also adopted the view that natural language does not allow extraposition to the left and concluded that left-adjointed relatives are base-generated in that position. Though this structural distinction between left and right-adjointed relatives is compatible with the fact that left-adjointed relatives do not display the...

\textsuperscript{18} In both (32) and (34), it is not possible to have a full noun phrase in the relative clause. Since internal heads are always possible in the case of correlatives, I take these sentences to involve noun modification rather than variable binding. Note also that (34) can have indefinite determiners on the nouns in the main clause, again suggesting that it belongs with restrictive relatives rather than with correlatives.
properties standardly associated with restrictive relativization, it does not explain it. The goal of this section is to characterize the nature of the relation between the left-adjointed relative and the main clause DP in such a way that its unusual properties can be accounted for.

Let us begin by seeing why the analysis of correlatives in (26a) does not automatically explain the absence of noun modification readings. Recall that in the Bach-Cooper system the implicit property variable inside the DP denotation allows an adjointed relative which is not its constituent at any syntactic level to be interpreted inside it. This is shown below:

\[(35)\]

\[CP/IP\]

\[\lambda R \text{all}(\text{ex}(\text{girl}'(x) \land R(x))) (\lambda x \text{stand}''(x))\]

\[\Rightarrow \text{all}(\text{ex}(\text{girl}'(x) \land \lambda x \text{stand}''(x)))\]

\[\Rightarrow \text{all}(\text{ex}(\text{girl}'(x) \land \text{stand}''(x)))\]

\[\text{IP}\]

\[\lambda x \text{stand}''(x)\]

\[\text{DP}\]

\[\text{all}(\text{ex}(\text{girl}'(x) \land \lambda x \text{stand}''(x)))\]

\[\text{NP}\]

\[\text{all}(\text{ex}(\text{girl}'(y) \land R(y(x))))\]

\[\Rightarrow \text{ex}(\text{girl}'(y) \land R(x))\]

\[\text{VP}\]

\[\lambda x \text{mQ}(x)\]

\[\text{all}(\text{ex}(\text{girl}'(y) \land R(y)))\]

\[\text{be-PR}\]

\[\text{that}\]

\[\text{girl}\]

While the interpretation we derive is intuitively correct for this sentence, it implies that a noun modification reading will always be available for correlatives. As we have seen, however, this is not the case. Correlatives with indefinite determiners are not acceptable, but there is no plausible way in which the use of the property variable in lowering the interpretation of left-adjointed relatives can be made sensitive to the definiteness of the main clause DP. (36a) is incorrectly predicted to have a valid interpretation on a par with (35):

\[(36) a. *_{j}o \text{lambli haiN khaRjii haiN} \text{do lambli haiN}\]

which girls standing be-PR two tall be-PR

"Which girls are standing, two are tall."

b. \[\exists x(\text{two}'(x) \land *_{j}o \text{girl}'(x) \land \text{stand}''(x) \land \text{tall}''(x))\]

Similarly, the difference between correlatives and embedded or right-adjointed relatives with respect to agreement, bound variable and disjoint reference facts becomes problematic if the Bach-Cooper semantics is accepted. It seems clear, then, that the use of implicit property variables for the purpose of interpreting relative clauses in positions lower than the site of origin must be blocked if we want to preserve the difference between correlatives and other noun modifiers.

It is worth pointing out in this connection that Cooper (1979) uses implicit property variables for two fundamentally different purposes. In one use, \(R\) serves to contextually restrict the interpretation of noun phrase meanings. Thus every man would be interpreted as \(\lambda x \text{all}(\text{men}'(x) \land R(x)) \rightarrow \text{P}(x))\) which denotes not the property set of all men but the property set of a pragmatically restricted subset of men. This restriction also plays a role in anaphoric relations found in donkey anaphora cases where the interpretation of \(R\) may be anaphoric. These uses seem to me qualitatively different from the use of property variables in interpreting relative clauses not present at the level of the common noun. Correlatives were considered the primary motivation for this use of property variables but the foregoing discussion has shown this to be based on mistaken assumptions about the meaning of correlatives. Of course, the evidence I have presented is only from Hindi, but the generalizations extend to the other Indic languages as well. Though crucial examples in Hitite and Walpiri are not available to me, there do not seem to be obvious counterexamples in the literature known to me. If correlatives in South Asian languages are representative of correlatives in general, the conclusion is obvious. The use of implicit property variables in relative clause interpretation is not valid.

This conclusion, in fact, echoes earlier concerns voiced in Jacobson (1983) (see also McCloskey 1979). As Bach and Cooper themselves note, modified noun phrases are also contextually restricted even though \(R\) is not present in the representation after the meaning of the relative clause combines with the DP. A solution to this problem is to introduce property variables inside relative clause clauses as well as DP's. Under this view, a correlative like (35) would be interpreted as \(\text{all}(\text{ex}(\text{girl}'(x) \land \text{stand}''(x)) \land R(x))\). In fact, the need for introducing property variables inside relative clause clauses denotations has been argued to be necessary to account for the possibility of stacking relative clauses. (37a), under this view, has the interpretation in (37b):
(37) a. Every man who I like who I invited came.
   b. IP₁
   \[ \text{DP₁} \]
   \[ \text{DP₂} \]
   \[ \text{CP₁} \]
   who I invited
   came

\( \text{DP} = \lambda \forall \text{man}'(x) \land R(x) \to P(x) \)
\( \text{CP₁} = \lambda y \text{like}'(ly) \land R(y) \)
\( \text{DP₂} = \lambda R \text{DP₁}(\text{CP₁}) \)
\( \lambda \forall \text{man}'(x) \land \lambda y \text{like}'(ly) \land R(x)(y) \to P(x) \)
\( \lambda \forall \text{man}'(x) \land \text{like}'(lx) \land R(x) \to P(x) \)
\( \lambda y \text{invited}'(ly) \land R(y) \)
\( \text{VP₁} = \lambda \text{cane}' \)
\( \text{IP₂} = \lambda \forall \text{man}'(x) \land \text{like}'(lx) \land \text{invited}'(lx) \land R(x)(x) \to \lambda y \text{cane}'(y) \)
\( \forall x \text{man}'(x) \land \text{like}'(lx) \land \text{invited}'(lx) \land R(x) \to \lambda \text{cane}'(x) \)
\( \forall x \text{man}'(x) \land \text{like}'(lx) \land \text{invited}'(lx) \land R(x) \to \text{cane}'(x) \)

Here the NP every man starts out with a property variable which is replaced by the meaning of CP₁. But the denotation of CP₁ itself has a property variable which can then be replaced by the meaning of CP₂. The property variable inside the denotation of CP₁ remains free and can provide the contextual restriction on the meaning of the whole DP, or the means whereby yet another relative clause could be added. In the case at hand, the DP denotes the set of properties of a contextually restricted subset of men who also have the two properties denoted by the relative clauses.

Jacobson (1983) argues against this analysis of stacked relatives and in favor of an analysis in which the second relative clause actually originates inside the first. In her account, the sentence under discussion derives from something like (38a), where CP₂ modifies the relative pronoun in CP₁. Obligatory extraposition accounts for the surface order shown in (38b):

Although Jacobson adopts the Bach-Cooper system and uses the property variable \( R \) in interpreting the CP₂ in its base position, note that the use of this variable is no longer necessary. Under present assumptions, extraposition leaves traces which can be interpreted as variables of the appropriate semantic type and serve as place-holders for the meaning of extrapoosed material. The only point where \( R \) plays a crucial role here is in the modification of man by CP₁, not in the interpretation of the stacked relative.

To sum up this section, I have considered two cases in which implicit property variables have been used as place-holders for relative clauses. In the case of languages with adjoined relative clauses I have demonstrated that this yields the right results only for right-adjointed structures that are also amenable to an extraposition analysis. In the case of correlatives, where an extraposition analysis is implausible, the use of implicit property variables leads to incorrect results. The other case I have discussed involves stacked relatives, which have independently been shown to be derived from extraposition. Thus in a system like the present where traces are interpreted as variables, the simplest way to account for the absence of noun modification readings in correlatives is to prohibit the use of implicit variables in interpreting expressions lower than their D-structure position. This implies that the coindexation between the relative clause and the DP in a correlative construction must be something other than noun modification and I will argue in section 3.3, that this relation is one of variable binding. Before doing that, however, I want to comment briefly on the structure of restrictive relativization in light of the claim that implicit property variables cannot be used to lower the interpretation of relative clauses.
3.2. The Structure of Restrictive Relativization

Recall that Partee (1975) argued that on semantic grounds the optimal analysis of restrictive relativization is one where the relative clause is sister to the common noun. Under present assumptions, this would be a structure in which the relative clause is adjoined at the level of NP, not DP. Most current works, however, take restrictive relativization to be adjunction to DP, relying implicitly or explicitly on the Bach-Cooper semantics to ensure the right interpretation (Chomsky 1986a, Safrin 1986). As Higginbotham (1980) points out, the choice between adjunction at DP and adjunction at NP must be based on semantic as well as syntactic considerations. Bach and Cooper's system provides a way of interpreting relativization at the level of DP but the preceding section has shown that correlatives, one of the original motivations for their analysis, actually argues against it. If the use of implicit variables is prohibited in the interpretation of restrictive relativization, it follows that restrictive relativization must be adjunction to NP as originally argued by Partee. In this section I want to consider some of the other arguments presented in the literature in favor of adjunction at the DP level and show how they can be handled if restrictive relativization is at the level of NP.

McCloskey (1979) argues for adjunction at the DP level on the basis of the fact that personal pronouns in Modern Irish can be modified by relative clauses in their restrictive sense. Assuming the standard analysis that pronouns are basic DPs, he argues that the modification must be at that level. As he notes, the argument rests on the assumption that pronouns are indeed DP's. A possibility he considers but ultimately rejects is that pronouns are in fact determiners, as suggested originally by Postal. If it were feasible to treat pronouns as determiners, however, an analysis of restrictive relativization at the NP level would be easy to motivate. Here I will try to revive the possibility of treating pronouns as determiners on the basis of Hindi, which like Modern Irish, and unlike English, allows restrictive relativization with third person pronouns.19 Consider the following paradigm:

19 English allows it to some extent, as in the following:
(i) He who fights and runs away lives to fight another day.
These seem to be restricted to generic statements and may be argued not to be part of the productive grammar of English.

RELATIVIZATION IN HINDI

<table>
<thead>
<tr>
<th>(39)</th>
<th>DEMONSTRATIVE + NOUN</th>
<th>PRONOUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominative</td>
<td>yo chiz/ye chiz</td>
<td>volye</td>
</tr>
<tr>
<td></td>
<td>that thing this thing</td>
<td>wey/e</td>
</tr>
<tr>
<td></td>
<td>ve chiz/eN/ye chiz/eN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>those things/these things</td>
<td></td>
</tr>
<tr>
<td>Oblique</td>
<td>us chiz/公社 chiz</td>
<td>uls</td>
</tr>
<tr>
<td></td>
<td>that thing/this thing</td>
<td>un</td>
</tr>
<tr>
<td></td>
<td>un chiz/eN/公社 chiz/eN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>those things/these things</td>
<td></td>
</tr>
</tbody>
</table>

The idea of treating pronouns as determiners, we see, is intuitively plausible, given the similarity between third person pronouns and deictic determiners.

In Abney (1987) pronouns are treated as intransitive determiners. That is, they are D's that do not take NP complements.20 Suppose we were to suggest that languages differ with respect to the possibility of modifying pronouns because they are intransitive D's in some languages but not in others. We might then say that only in those languages where pronouns are transitive, will restrictive relativization be possible.

Hindi third person pronouns, for example, could be analysed as transitive D's since they have the same form as noun phrase determiners. We get a DP like vo larkaa "that boy" when the NP complement is lexically headed, otherwise a pronominal form like vo "(s)he". While this is usually translated as "he" or "she", there is nothing specious I think in analysing it as "that one". Thus the difference between a relative clause restricting a full noun phrase and one restricting a third person pronoun in Hindi would be the following:21

20 Abney's analysis preserves Postal's idea but incorporates it within X'-theory since the category of the noun phrase is DP and its head is D'. Within the older system, generating an intransitive determiner amounted to a structure in which the noun phrase was an NP with a head that was Det.
21 There need not be an empty position generated under NP in (40): Transitive determiners could directly take CP complements or possibly NP complements dominating CP [X,CP]. The semantics would remain as for (40a).
Consider the semantic interpretations of the two structures. In (40a) the denotation of the NP is semantically vacuous and lets in every individual in the domain of discourse, modulo contextual restrictions. The set denoted by CP intersects with the set of entities to give the set denoted by the CP and the determiner takes this as its first argument. The procedure is fully parallel to the regular noun phrase relativization shown in (40b).

In a theory where pronominal relativization is at the level of DP, it has to be stated for different languages whether a DP that dominates a pronoun can be modified. In the present approach it has to be stated for different languages whether a pronoun is transitive or intransitive. As far as I can see there is thus no real argument from pronominal modification in favor of a structure in which restrictive relatives are attached at the level of DP.

A second argument for the DP analysis, presented by Jacobson (1983), is that items such as *everyone* can be modified by a relative clause. This again rests on the assumption that items like *everyone* are basic DP's. However, Abney (1987) has argued that *everyone* involves head to head movement of *one* from the NP complement of D:

If this analysis is right, relativization at the level of NP becomes entirely plausible.

Thus I take it that there is no motivation for moving from a structure for relativization that transparently reflects meaning, i.e. adjunction at the level of NP, to one in which implicit variables are needed to ensure the right interpretation, i.e. adjunction at the level of DP. This supports the conclusion reached independently on the basis of correlatives.

### 3.3. Correlatives and Variable Binding

I have shown above that the relation between the relative clause and the main clause DP in a correlative construction is not that of noun modification. In this section I would like to propose that the relative clause in a correlative construction is an operator that binds a variable in the main clause.

We saw in section 1.3, that the only main clause DP’s that are compatible with left-adjointed relatives are those which can be analysed as having a demonstrative. Further evidence for this comes from the following:

22 Another advantage of treating restrictive relativization as adjunction to NP is that it would provide a way of structurally distinguishing them from non-restrictive relatives. It seems quite plausible to treat non-restrictive as adjoining to DP since they typically attach to names. Names, I assume, can be basic DP's in every language.

23 Needless to say, it is perfectly acceptable to have right-adjointed and embedded relatives construed with a question wh word in the main clause:

(0) *kaun laRkaa vahaaN rahtaa hai jo khuRaa hai*

which boy there live-PR who standing be-PR
LOCALITY IN WH QUANTIFICATION

(42a) *jo laRka khaRe haiN kaun vahaaN rahaN hai
which boys standing be-PR who there live-PR

"Which boys are standing, who lives there?"

b. jo laRka khaRe haiN un-meN-se
which boys standing be-PR them-PART
kaun vahaaN rahaN hai
who there live-PR

"Which boys are standing, who out of them lives there?"

(42a) shows that the relative clause cannot be construed with a question wh expression. (42b) shows that there is no inherent incompatibility between correlative constructions and question formation. The only difference between the two is that the main clause DP now has a variable. We might say that a left-adjointed relative, being an operator, must bind a variable, otherwise it will be ruled out as a case of vacuous quantification.24 A question word, being itself a quantificational element, cannot provide this variable but a demonstrative can.

Similarly, the relative clause cannot be construed with a proper name in the main clause:

(43) *jo laRki khaRi hai anu lambii hai
which girl standing be-PR Anu tall be-PR

"Which girl is standing, Anu is tall."

(43) shows that a left-adjointed relative is not non-restrictive since non-restrictives typically occur with proper names.25 This point is worth

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RELATIVIZATION IN HINDI

making because the left-adjointed relative has a definite reading and is sometimes confused with non-restrictives because of this. (43) is ruled out by the generalization that a left-adjointed relative clause must crucially bind a variable inside the main clause. Since proper names are referential, they are not appropriate binders for the relative clause. The sentence is ruled out on a par with other cases with a missing demonstrative.

In concluding this section I want to demonstrate that there are constraints on the binding involved in a correlative construction that are typical of operator-variable relationships. Complex noun phrases in Hindi, we saw in chapter II, are islands for extraction. This is demonstrated again in (44a) where topicalizing out of the complex DP leads to unacceptability. (44b) shows that a relative clause construed with a DP inside the complex DP also leads to ungrammaticality. This suggests that the DP coindexed with a left-adjointed relative has the status of a variable:

(44a) *ravi main [yeh baat ki ti]
Ravi I this matter that
nahiN aayega aantii thi not come-F know-P

"Ravi I knew the fact that he will not come."

(Ravi, I knew the fact that he will not come)

b. *jo vahaaN rahaN hai maN [yeh baat ki vo
who there live-PR I this matter that he
nahiN aayega aantii thi not come-F know-P

"Who lives there, I knew the fact that he will not come."

Recall that left-adjointed structures can be construed with null pronouns. The unacceptability of structures like (44b) is further shown by the fact that substituting pro in place of the DP makes the sentence completely ungrammatical.

Further, correlatives also show weak crossover effects, typical of variable binding constructions, though admittedly, this is not very strong. However, the unacceptability becomes extremely clear if the variable is a pro:

out one of them. This use of proper names is similar to that in English. The Smiths who live here are my friends does not use Smith as a proper name.
LOCALITY IN WH QUANTIFICATION

(45) *jo vahan (N) rahtaa hai, [ek aurat jis-ko vo pyaar
who there live-PR a woman who-A he love
karta hai] [har-ko, shahidi naahiN karega[i]]
do-PR he-INS marriage not do-F
"Who lives there, the woman whom he loves will not
marry him."

This example has the schema [{c-relative clause}, {p[NP...pronoun...]} {VP...pronoun...}]. The pronoun inside the subject noun phrase cannot be the element bound by the relative clause since it is inside an island, as was shown by (44b). Therefore it is the pronoun in the VP that the relative clause must bind. This blocks coreference between the two pronouns. The pronoun inside the VP being a bound variable, coinlexation with a pronoun to its left leads to a weak crossover violation. Of course, there would be no problem with coreference if there was no left-adjointed relative clause. The problem is not internal to the main clause, but a result of coinlexation between the relative clause and the VP-internal demonstrative.

We see, then, that the variable bound by the relative clause is like variables created by movement. This may appear somewhat problematic since we have explicitly argued against a movement account of correlatives. The pronoun in the main clause, under the approach suggested here, is a resumptive pronoun which is supposed to be insensitive to the effects observed here (McCloskey 1989:14). Sells (1984, 1987) provides a diagnostic for separating resumptive pronouns from variables which are locally A' bound. He argues that the former force extensional readings while the latter are ambiguous between extensional and intensional readings. If this is true then it is easily shown that the pronoun in a correlative construction behaves like a variable. The following clearly allow for intensional interpretations:

(46) a. jo cite maya cauhiye thi vo us-ko mil gayi
which thing I-D needed be-P that he-D get-P
"Which thing I wanted, he got it."

CONCLUSION

To sum up, I have shown in this chapter that right-adjointed relatives manifest typical properties associated with restrictive relatives while left-adjointed relatives display some unusual properties. On this basis, I argue that relative clauses that are adjuncted at the clausal level instantiate two distinct types of relationships with arguments in the main clause. Adopting the view that extraposition is strictly a rightward movement, I have analysed right-adjointed relatives as being generated inside the main clause DP and moved to the right periphery of the clause as S-structure. I have analysed left-adjointed relatives as base-generated in that position. Using as evidence the absence of noun modification readings for left-adjointed relatives I have argued against the use of implicit property variables in interpreting relative

36 Actually, he uses the notion of a "concept" reading to distinguish the two. I use the term 'intension' to make the point because it is more familiar. The distinction between the two, though important, is not directly relevant.

27 For example, resumptive pronouns in Swedish license parasitic gaps and in structures where subjacency violations obtain, their presence does not lead to grammaticality. Unfortunately, parasitic gaps are not testable in Hindi.

28 There appears to be only one exception to the locality requirement. A demonstrative inside a noun phrase can be bound by the quantifier if it is in specifier position, i.e. if it carries genitive case as in (i):

(i) jo larkii khali hai [us-ki bajan] lambii hai
which girl standing be-PR de-O sister tall be-PR
"Which girl is standing, her sister is tall."
clause that are syntactically higher than the DP they are supposed to modify at D-structure. Hindi correlatives, I have claimed, argue for a more traditional view of restrictive relativization at the NP level. This is contrary to standard assumptions where correlatives are taken as the primary motivation for restrictive relativization at the DP level. It seems to me that the conclusions reached on the basis of empirical considerations allow for a more straightforward mapping from syntax to semantics, and are therefore to be preferred on theoretical grounds as well. Finally, I have shown that the left-adjointed relative enters into an operator-variable relation with the main clause DP and I have presented evidence to show that this relationship respects locality. In the next chapter I take a closer look at the semantics of correlatives, making precise the nature of the particular operator-variable relation argued for here.

CHAPTER VI

RELATIVE CLAUSES AS DEFINITES

INTRODUCTION

The focus of this chapter is the semantics of correlatives. It takes as its point of departure the claim in Chapter V that a relative clause left-adjointed to IP is coindexed with a DP in the main clause and that this instantiates an operator-variable relation. In this chapter the semantics associated with this relation is made explicit. Treating the relative clause as a generalized quantifier and the main clause DP as a variable, I show how the two combine via standard rules of quantification. I also introduce here the phenomena of multiple wh correlatives, structures in which more than one wh expression in the relative clause is coindexed with the corresponding number of demonstratives in the main clause. I show that single wh and multiple wh correlatives have behavior parallel to single wh and multiple wh questions. By extending the semantics for questions developed in Chapter IV, I account for the uniqueness/maximality effects in single wh correlatives and the functional relations in multiple wh correlatives. I then show how tense and aspect impacts upon these interpretations. Finally, I connect correlatives with relative clauses with similar semantics in other languages. The main point I establish in this chapter is that relative clauses in natural language function not only as noun modifiers and appositives but also as definites. Correlative-like structures, though syntactically unusual, are semantically common across languages. English free relatives and internally-headed relatives in Quechua, Lakhota and Japanese, for example, all display uniqueness/maximality effects.