LIST OF CONVENTIONS

IPA symbols are used in transcribing Hindi sounds, except for the following.

t:	voiceless dental stop
d:	voiced dental stop
T:	retroflex voiceless stop
D:	retroflex voiced stop
R:	retroflex flap
N:	nasalization of preceding vowel
h:	aspiration of preceding consonant
c:	voiceless alveopalatal affricate
j:	voiced alveopalatal affricate
y:	alveopalatal glide
ii:	front long tense high vowel
uu:	back long tense high vowel
ai:	front lax mid vowel
au:	back lax mid vowel
a:	lax mid central vowel
aa:	lax low back vowel

The following conventions are used, mainly in the glosses.

A:	accusative case
D:	dative case
G:	genitive (possessive) case
E:	ergative case
INS:	instrumental case
P:	past tense
F:	future tense
PR:	present tense
SUBJ:	subjunctive form
PROG:	progressive aspect marker
PRF:	perfect aspect marker
INF:	non-finite form
PART:	partitive
PSI:	polarity sensitive item
PCPL:	participial

CHAPTER I

INTRODUCTION

This book deals with the relation between syntactic structure and semantic representation in the analysis of wh constructions. The central claim I want to advance is that semantic interpretation is defined on structures that are close to surface syntax. In particular, I want to claim that the scope domain of a wh expression is the clause in which it occurs at surface structure. This, of course, leaves open issues of interpretation that would otherwise be handled by assigning scope to wh expressions outside the local domain. I argue, however, that intuitions about meaning in these cases are better handled by an enhancement of the semantics used in interpreting wh structures. The proposed modifications, justified on independent grounds, are shown to obviate the need for deriving representations that diverge sharply from surface structure. The syntactic claim of locality is based primarily on data from Hindi, though reference to other languages is also made. In explicating the semantics, English data is used whenever the intuitions are the same as for Hindi. The goal, of course, is to make an explicit proposal so that its applicability across languages can be empirically tested.

The investigation of Hindi wh structures is carried out in two parts. I deal first with questions and then with relative clauses. In each case, I first discuss the syntax of the relevant structures in Hindi, establishing the factors that determine scope. I then turn to issues of interpretation, showing how the appropriate meanings can be derived within the constraints on scope imposed by the syntax. In order to orient the reader to the range of the investigation, I give a brief summary of each chapter, discussing the core empirical problems addressed there and the general conclusions reached. I do not present full justification or argumentation here, leaving that for individual chapters to develop.

1. QUESTIONS

1.1. *Locality and Wh Movement*

1.1.1. S-Structure vs. LF Movement The claim that the scope of wh expressions is determined by surface structure position is not controversial as far as overtly moved wh is concerned but goes against standard assumptions about wh in-situ (but see Nishigauchi 1986, 1990 and Pesetsky 1987). A crucial piece of evidence differentiating overtly moved wh from wh in-situ is the following:

(1) a. *What$_i$ do you wonder [who$_j$ [t$_j$ saw t$_i$]]?

    b. Who knows [where Mary bought what]?

Ross (1967) showed that extraction out of a wh island leads to ungrammaticality, as in (1a). It was observed by Baker (1970), however, that a question like (1b) can be answered by naming the individual or individuals who know the answer to the indirect question. Or it can be answered by naming pairs of individuals and objects such that the individual knows where Mary bought that object. The latter answer is analyzed as deriving from a representation in which the embedded wh in-situ has matrix scope. Baker's analysis of the ambiguity of (1b) implies that wh-island effects do not hold for wh in-situ.

Huang (1982) provided the other major insight into differences between overtly moved wh and wh in-situ. He pointed, for example, to the contrast between extraction out of relative clauses in English and Chinese:

(2) a. *Who$_i$ do you like [books that criticize t$_i$]?

    b. ni   zui   xihuan [piping shei de   shu]
       you most like   criticize who REL book
       "Who is such that you like books that criticize him?"

Overt wh movement in English violates Ross's complex noun phrase constraint (CNPC). Chinese allows a direct question interpretation for wh embedded inside the relative clause, suggesting that the wh in-situ takes scope at the matrix clause level in violation of CNPC. Huang's conclusion is that subjacency, the principle that subsumes the wh-island condition and the CNPC, holds at the level of S-structure but not at the level of Logical Form, a position endorsed in Chomsky (1986a).

1.1.2. LF Movement in Hindi Hindi, like several other Indo-European languages spoken in North India, manifests an interesting typological variation with respect to wh movement at LF. Although Hindi wh expressions can be moved at S-structure as an instance of scrambling or topicalization, these are optional processes. The basic question formation strategy in Hindi, as in Chinese, involves wh in-situ. Crucially, however, the behavior of wh in-situ in Hindi differs from Chinese with respect to subjacency effects.

Consider, for example, the difference between Hindi (3) and Chinese (4) or between the Chinese (2b) and Hindi (5):

(3)   anu jaannaa   caahtii hai [ki kis-ne kyaa khariidaa]
       Anu know-INF want-PR   that who-E what buy-P
       "Anu wants to know who bought what." NOT
       "What is such that Anu wants to know who bought it?"

(4)   ni   xiang-zhidao [shei mai-le   sheme]
       you wonder   who buy-ASP what
       "Who is such that you wonder what s/he bought?"
       "What is such that you wonder who bought it?"

(5)   *[kitaabeN jo   kis-ne likhiiN] mez par rakhii haiN
       books   that who-N write-P table on kept be-PR
       "Who is such that the books s/he wrote are on the table?"

(3) has an unambiguously indirect question reading, while (4) allows a direct question interpretation. And (5), unlike (2b), is ungrammatical. Clearly Hindi is not like Chinese. It displays wh-island and CNPC effects at LF.

The first task we are faced with in analyzing the data is determining the parameter along which Hindi and Chinese might differ. There are two possibilities to consider. It may be that they differ with respect to the applicability of subjacency at LF. Or it may be that subjacency applies universally at LF but parametric variation in syntactic structure renders the effects of subjacency void in one language but not the other. The issue is a complex one and we will not go into it just yet. What I want to draw attention to at this point is the descriptive generalization that Hindi wh in-situ, unlike Chinese wh in-situ, manifests locality effects. This means that we cannot appeal to non-local scope properties of wh in-situ to explain any quantificational phenomena in Hindi. A second task, then, is to account for the meaning of wh structures in Hindi while maintaining locality at LF, the level at which interpretation applies.

1.2. *Questions In Hindi*

1.2.1. The Scope of Hindi Wh   The discussion of Hindi questions centers around the scope of wh expressions inside finite complements. In Chapter II I show that the inability of Hindi wh in-situ to escape a wh island, as in (3) above, is part of a general inability of such expressions to take scope outside finite complements. This, in turn, is explained by the constraints on LF movement imposed by the structure of Hindi.

Hindi is a language that allows free word order but is basically SOV (Gambhir 1981, Mahajan 1990):

(6)   anu-ne kitaab khariidii
        Anu-E book buy-P
        "Anu bought a/the book."

Clausal complements, however, differ in position depending on finiteness. Non-finite complements occur in the canonical preverbal position for objects but finite complements occur at the right periphery of the clause. Wh expressions in non-finite clauses take matrix scope while those in finite clauses take narrow scope. Finiteness and a switch in directionality go together in determining the scope of Hindi wh in-situ:

(7) a.   anu [kyaa karnaa] jaantii hai
        Anu what do-INF know-PR
        "What does Anu know to do?" NOT
        "Anu knows what to do."

    b.   anu jaantii hai [ki kyaa karnaa hai]
        Anu know-PR that what do-INF be-PR
        "Anu knows what is to be done." NOT
        "What is such that Anu knows it has to be done?"

I explain the switch in directionality in terms of the Case Resistance Principle of Stowell (1981). Non-finite complements are nominalizations that can occur in the case position to the left. Finite complements cannot appear in case positions but must appear right-adjoined to IP or CP. They are syntactic adjuncts coindexed with an argument position in the matrix clause, here represented simply as an empty category:

(8)
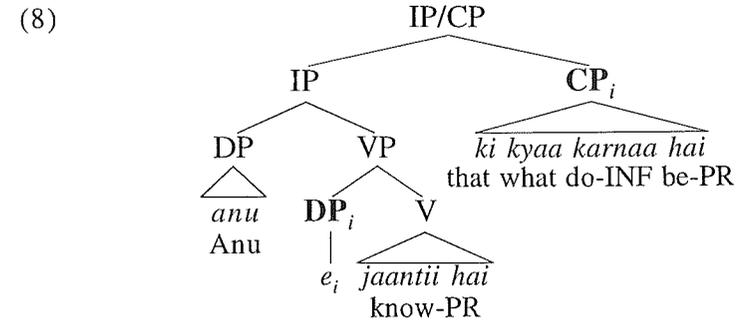
I adopt the view in Cinque (1990) that long wh movement is an instance of a binding chain and successive cyclic movement an instance of a government chain. While all wh expressions enter into government chains only argument wh expressions enter into binding chains. In (8), CP_i is a barrier to government because it is not directly selected by a verb. Even if CP_i were to be considered indirectly selected by the verb, it would not be in the canonical government direction for an SOV language. Thus it also qualifies as a binding barrier. Long as well as successive cyclic movement out of the right adjoined CP is blocked by subjacency. Since the wh's are in situ in Hindi this establishes that subjacency holds at LF.

Ordinary adjuncts in Hindi, however, allow direct question interpretations of wh expressions inside them:

(9) a.   anu kis-se   milne   ke baad ghar gayii
        Anu who-INS meet-INF after   home go-P
        "After meeting who did Anu go home?"

    b.   *anu kaise bartan saaf karne ke baad thak gayii
        Anu how dishes clean do-INF after   tired become-P
   "For what x, Anu got tired after washing dishes in manner x?"

The kind of argument-adjunct asymmetries we see in (9) have traditionally been taken to indicate that subjacency, or constraints on binding chains in Cinque's terms, can be violated at LF. Since we have independent evidence that subjacency effects hold at LF in Hindi, such examples provide evidence for Nishigauchi's (1986, 1990) claim that pied-piping is responsible for so-called long wh movement at LF.

1.2.2 Locality in Scope Marking   In Chapter III I consider the strategy used in Hindi for questioning out of finite complements. (10) illustrates what is known in the literature as the scope marking structure (van Riemsdijk 1983):

(10)   jaun kyaa soctaa hai [ki merii kis-se   baat karegii]
       John what think-PR that Mary who-INS talk do-F
       "Who does John think Mary will talk to?"

The hallmark of scope marking is that there is a wh expression in the matrix but the answer specifies values only for the wh expression in the embedded clause, giving rise to the view that the sole function of the matrix wh is to extend the scope of the embedded wh. One way of deriving the desired effect is to replace the matrix wh at LF by the embedded wh as an instance of expletive replacement. The problem for Hindi is obvious. LF wh movement out of finite complements is unavailable.

I develop an account of scope marking in which the matrix wh is not an expletive but an ordinary wh argument of the matrix verb, coindexed with the adjoined finite complement. That is, a scope marking structure instantiates the type of adjunction that is standard for finite complementation in Hindi. As far as wh movement goes, matrix and embedded wh expressions both take local scope but the coindexation of the dominating nodes connects them into an indirect wh dependency:

(11)
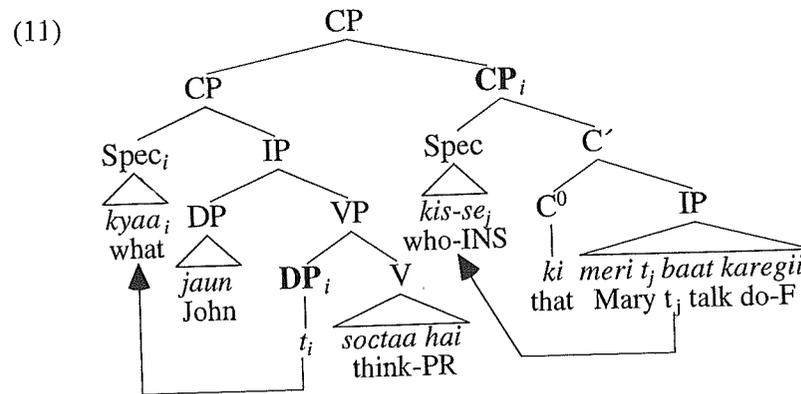
This syntactic analysis is substantiated by a semantics in which the matrix wh is treated as quantifying over propositions and the embedded clause as forming the restriction of this quantification. I adopt the theory of questions in Hamblin (1973) where questions

denote the set of possible answers. Applying compositional rules of intepretation, I derive (12) as the translation of (11):

(12) $\lambda p \exists q [\lambda p' \exists x [p' = ^\wedge \text{will-talk'}(m,x)](q) \wedge [p = ^\wedge \text{think'}(j,q)]]$

Answers now list propositions that John stands in the *think* relation to and which furthermore are members of the indirect question. The indirect question denotes the set of propositions that list the individuals Mary will talk to.

The point to note is that the embedded wh does not actually have matrix scope. In giving values for the matrix wh, however, answers end up giving values for the embedded wh. This chapter establishes that the wide scope interpretation of embedded wh expressions in scope marking structures is only apparent. In point of fact, scope marking structures are semantically distinct from corresponding extraction structures. These distinctions are maintained by ensuring that the scope of the embedded wh in scope marking structures is strictly local.

1.2.3. Long-Distance List Answers   Chapter IV deals with another phenomenon that is generally assumed to involve non-local scope assignment of wh in-situ. Consider the following:

(13)   kaun laRkaa jaantaa hai
       which boy   know-PR
       ki   merii-ne kahaaN kaunsii kitaab khariidii
       that Mary-E where   which book buy-P
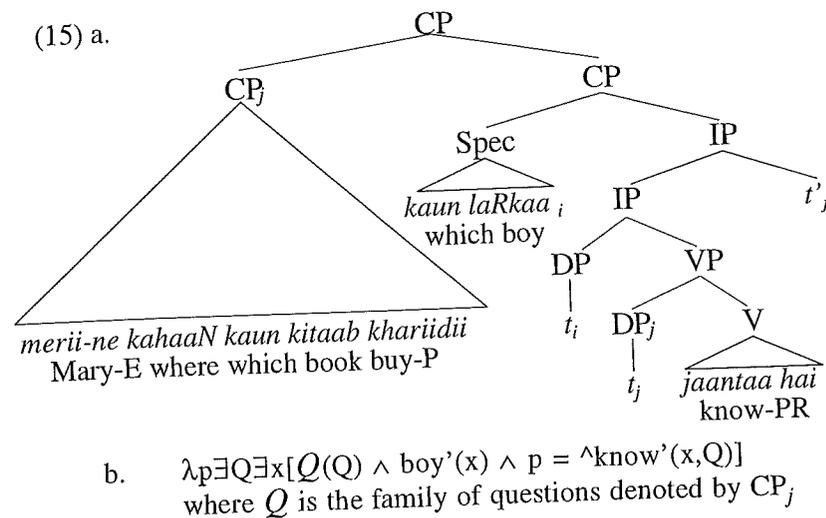   "Which boy knows where Mary bought which book?"

This question is ambiguous in exactly the same way as the corresponding English question (1b). Of particular interest to us here is the answer that lists pairs of individuals and objects. Such answers are generally derived by giving wide scope to the embedded wh, a move that we know is not tenable for Hindi.

I show that in order for long-distance lists to be available, the embedded wh in-situ must refer to a contextually given set of objects. That is, it must be D-linked in the sense of Pesetsky (1987). However, Pesetsky's approach to D-linking does not apply since a long-distance list is only available if the embedded clause is a multiple wh question. (14) has only one embedded wh in-situ and does not allow a long-distance list answer:

(14)   kaun laRkaa jaantaa hai
        which boy   know-PR
        ki   merii-ne kaunsii kitaab khariidii
        that Mary-E which book buy-P
        "Which boy knows which book Mary bought?"

The proposal I advance is that multiple wh and single wh
questions differ in semantic type. The former can denote a set of sets
of propositions (i.e. a set of questions) while the latter denotes a set of
propositions. Such distinctions are motivated independently on the
basis of echo questions, which have several properties in common with
D-linked questions.

I further take the matrix verb *know* to denote a relation between
individuals and questions. In the case of (14) the complement
denotes a set of propositions, an ordinary question. Thus, the relation
know is defined. (14) asks for the unique individual who knows the
answer to the indirect question. In the case of (13), however, the
complement denotes a family of questions, one for each member of
the D-linked set. *Know* is not defined and QR is needed to repair the
type mismatch:

(15) a.

b. $\lambda p \exists Q \exists x [Q(Q) \land \text{boy'}(x) \land p = {}^{\wedge}\text{know'}(x,Q)]$
        where Q is the family of questions denoted by CP_j

The resulting structure is interpreted as a multiple wh question
involving the matrix wh and the indirect question, not the matrix wh
and embedded wh in-situ. One can think of it as a question that looks
for a pairing between boys and questions in the denotation of the
complement, as shown in (15b). The precise nature of this pairing is

further elaborated within the functional approach to questions
developed by Engdahl (1986) and Chierchia (1991, 1993).

Apart from getting the variation between (13) and (14), this
approach to long-distance lists accounts for locality effects in D-
linking, noted by Mahajan (1990). As (16) shows, a long-distance list
answer is not possible if the matrix wh is separated from the multiple
wh complement by an intervening clause:

(16)   kaun laRkaa soctaa hai ki   ravi jaantaa hai
        which boy   think-PR that Ravi know-PR
        ki   merii-ne kahaaN kaunsii kitaab kharidii
        that Mary-E where   which book buy-P
        "Which boy thinks that Ravi knows where Mary bought
        which book?"

If we make the standard assumption that QR is a local operation, the
multiple wh complement could only adjoin to the intermediate clause.
This position is too far from the matrix Spec to allow scope
interaction between the matrix wh and the embedded question. The
only possible interpretation for (16) is the standard one where the
question asks for a unique boy who has the relevant property.

This chapter also looks at cases of long-distance lists that are not
dependent on D-linking. Here too, a plurality-based account which
does not require wh movement out of the complement is argued to
capture a wider range of facts.

Maintaining locality in scope assignment, we see, once again
results in a more optimal analysis of the phenomenon. Since the
alternative proposed for Hindi is not dependent on aspects of
grammar that are subject to parametric variation, it is expected that
long-distance lists can be derived in any language without LF
movement of wh in-situ. The results of this chapter invalidate the
strongest evidence traditionally adduced in support of the view that LF
movement is immune to subjacency.

2. RELATIVE CLAUSES

2.1. Relative Clauses and Noun Modification

The discussion of locality in Hindi relative clauses centers on the
relation between the relative clause as a whole and the DP it is
construed with, rather than on the relation between the wh in Spec and
its trace. The central question under investigation is the possibility of
interpreting a relative clause in a position lower than its site of origin.

I argue against this on the basis of facts from Hindi, showing that such lowering makes incorrect predictions about meaning. I argue instead that a relative clause that is generated higher than the DP it is construed with enters into an operator-variable relation with it.

Relative clauses that function as noun modifiers are often assumed to be attached at the level of the noun phrase rather than at the level of the common noun. If noun phrases are treated as DP's (Abney 1987), this amounts to treating relative clauses as daughters of DP, as in (17a) not of NP, as in (17b):
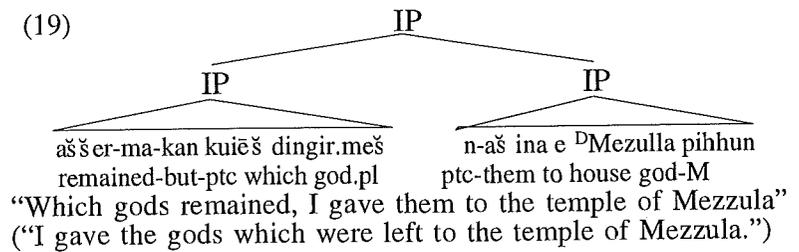
(17) a.

  b.
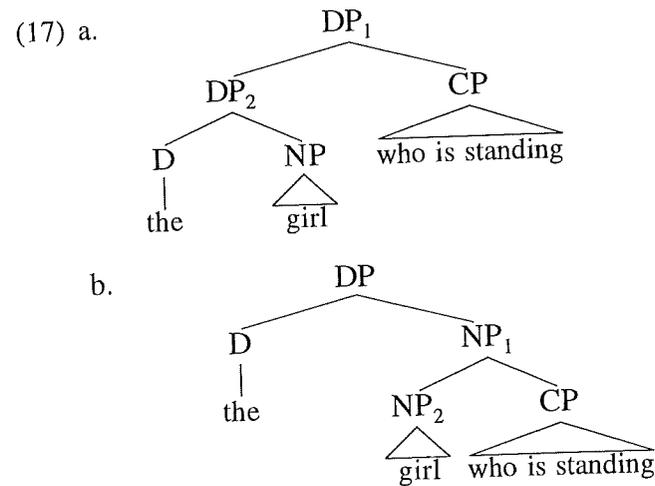
As Partee (1975) has argued, however, the semantics of noun modification favors (17b) over (17a). The interpretation of the unmodified DP_2 in (17a) requires there to be a unique girl in the domain of discourse. DP_1, however, is understood to denote a unique individual who is both a girl and is standing. As pointed out by Partee the use of the restrictive relative is felicitous only if *girl* is not uniquely denoting so that the relative clause can serve to ensure uniqueness. For (17a) to capture the meaning, then, the interpretation of DP_2 *the girl* has to include the meaning of the relative clause, even though it occurs higher in structure. (17b), on the other hand, is transparent with respect to interpretation. The determiner has scope over the modified noun phrase so that uniqueness is expected to be defined on the intersection of the set of girls and the set of people standing rather than on the set of girls simpliciter. Interpretation can proceed compositionally.

A solution to the problem of interpreting the relative clause compositionally in (17a) is provided by Bach and Cooper (1978) and

Cooper (1979). They suggest that the interpretation of NP's includes a free property variable which can be abstracted over at the DP level and the value of the relative clause filled in by lambda conversion. DP_2 in (17a), under this view, would be interpreted as (18a) and would combine with the relative clause as in (18b) to yield the right interpretation for the noun phrase:

(18) a. DP_2: $\sigma x\ [girl'(x) \wedge R(x)]$

    b. DP_1: $\lambda R\ \sigma x\ [girl'(x) \wedge R(x)]\ (\lambda z[stand'(z)])$

        $\Rightarrow \sigma x\ [girl'(x) \wedge \lambda z[stand'(z)](x)]$

        $\Rightarrow \sigma x\ [girl'(x) \wedge stand'(x)]$

Bach and Cooper's use of implicit property variables to interpret relative clauses in positions lower than their surface structure position is motivated on the basis of languages like Hittite where relative clauses are base-generated adjoined to the main clause. Cooper (1979) gives the following example from Raman (1973) exemplifying what is known as the correlative construction:

(19)

aš š er-ma-kan kuieš dingir.meš   n-aš ina e ^{D}Mezulla pihhun
remained-but-ptc which god.pl   ptc-them to house god-M
"Which gods remained, I gave them to the temple of Mezzula"
("I gave the gods which were left to the temple of Mezzula.")

Here the property variable R in the meaning of the pronoun *n-aš* "them" enables the relative clause to be interpreted inside DP without being syntactically there.

The availability of the semantic procedure sketched in (18) has led to the view, now current, that relative clauses are attached higher than NP even in languages like English where the head and the relative clause are not discontinuous as in Hittite. In chapters V and VI, I present evidence from Hindi correlatives arguing against the use of semantic variables in the interpretation of relative clauses in adjoined positions.

2.2. *Hindi Relative Clauses*

2.2.1. Relativization Structures in Hindi   Chapter V shows Hindi to be typologically like Hittite in allowing relative clauses to occur at the periphery of the clause:

(20) a. jo   laRkiyaaN khaRii   haiN   ve   lambii haiN
        which girls   standing be-PR they tall   be-PR

     b. ve   laRkiyaaN lambii haiN   jo   khaRii   haiN
         those girls   tall   be-PR who standing be-PR

        "The girls who are standing are tall."

Two approaches to the phenomenon are considered. One is to take the relative clause in these sentences to be adjoined to the main clause at D-structure (Keenan 1985, Andrews 1985). Under this view, Bach and Cooper's implicit property variable in the noun phrase denotation would be needed to derive a meaning in which the relative clause modifies the noun phrase. An alternative approach is to take the relative clause as base-generated inside the DP and moved to the periphery as a result of extraposition (Verma 1966, Kachru 1973, 1978, Subbarao 1984). This view has some appeal because of the possibility of structures like (21) where the relative clause occurs in the putative base position. Under this approach, the trace of the extraposed CP would serve as a place holder, ensuring the right interpretation for the structures:

(21)   ve   laRkiyaaN jo   khaRii   haiN   lambii haiN
         those girls   who standing be-PR tall   be-PR

        "The girls who are standing are tall."

The fundamental contribution of this chapter is to establish that the two relativization structures instantiated in (20) are not the same. Crucial data involves substituting indefinites in the matrix clause DP. This is not acceptable for relative clauses adjoined to the left of the clause but is perfectly acceptable for those adjoined to the right:

(22) a. *jo   laRkiyaaN khaRii   haiN   do   lambii haiN
          which girls   standing be-PR two tall   be-PR

     b. do laRkiyaaN lambii haiN   jo   khaRii   haiN
        two girls   tall   be-PR who standing be-PR

     c. do laRkiyaaN jo   khaRii   haiN   lambii haiN
        two girls   who standing be-PR tall   be-PR

        "Two girls who are standing are tall."

I propose that Hindi actually has two types of relativization. Right-adjoined relatives are derived via extraposition from structures in which the relative clause is generated inside the noun phrase. Extraposition to the left being universally proscribed (Baltin 1985), left adjoined relatives cannot be analyzed as originating inside the DP. Instead they must be recognized as adjoined at the clausal level at D-structure. The three relativization structures instantiated by (20a), (20b) and (21) are given schematically in (23):

(23) a. $[_{IP} [_{CP_i}$Relative clause] $[_{IP}...DP_i...]]$

     b. $[_{IP} [_{IP}...[_{DP}D [NP \ t_i]]...] [_{CP_i}$Relative clause]]

     c. $[_{IP}...[_{DP}D [NP [_{CP}$Relative clause]]]...]$

(23b) and (23c) are instances of ordinary noun modification, the relative clause in (23b) being interpreted in the base position due to the presence of its trace. It is therefore compatible with any determiner. The relative clause in (23a) is not a noun modifier and is not interpreted in the scope of the determiner. Instead it is a quantifier that binds the variable denoted by the main clause DP. The unacceptability of sentences like (22a) follows from the fact that indefinites are not appropriate variables for binding.

This analysis of Hindi relativization structures suggests that implicit property variables cannot be used to interpret relative clauses in lower positions, a view that is in keeping with the discussion of Bach and Cooper's analysis in Jacobson (1983).

2.2.2. Relative Clauses as Definites   In Chapter VI, I focus on the semantics of correlatives. My goal here is to give an explicit semantics for correlatives and to relate it to the semantics of similar constructions in other languages.

I interpret a left-adjoined relative clause as a generalized quantifier that binds a variable inside IP. The relative clause denotes the set of properties of the unique individual of whom the predicates inside the relative clause hold. The pronoun in the main clause is treated as a variable which is abstracted over, in order to combine with the relative clause. The whole sentence is true if and only if the property denoted by the main clause is one of the properties denoted by the relative clause. The relation between binder and bindee obviously respects locality.

Assuming a theory like Link (1983) or Landman (1989) where singular and plural entities are included in the domain of individuals, (20a) would be interpreted as (24a). A corresponding sentence with singular morphology would be interpreted as (24b):

(24) a. $\lambda PP(\sigma x\ [*girl'(x) \wedge stand'(x)])(\lambda ztall'(z))$

      $\Rightarrow \lambda ztall'(z)(\sigma x\ [*girl'(x) \wedge stand'(x)])$

      $\Rightarrow tall'(\sigma x\ [*girl'(x) \wedge stand'(x)])$

   b. $tall'(\sigma x\ [girl'(x) \wedge stand'(x)])$

(24a) asserts of the maximal plural individual who is a girl and is standing that she is tall, while (24b) asserts this of the maximal atomic individual, that is, of the unique atomic individual.

An interesting consequence of this approach is that it can extend to multiple correlatives such as (25a). These structures have two (or more) wh elements in the relative clause linked to a matching number of demonstratives in the main clause:

(25) a. jis   laRkii-ne jis   laRke ke saath khelaa
       which girl   which boy   with   play-P

       us-ne us-ko haraayaa
       she   him   defeat-P

       "Which girl played with which boy, she defeated him."
       ("For any pair of girl and boy, such that the girl played with the boy, the girl defeated the boy.")

   b. $\forall_{xy}\ [[girl'(x) \wedge boy'(y) \wedge played\text{-}with'(x,y)]$
      $\rightarrow defeated'(x,y)]$

A rough approximation of the meaning of (25a) is given by the first order formula in (25b). In point of fact, the quantification involved in correlatives is more complex and can be best understood in terms of the difference between single and multiple wh questions, as in the following English examples:

(26) a. Which boy came to the party?

   b. Which boy saw which girl?

While (26a) implies that a unique individual will be named in the answer, (26b) suggests that each boy will be paired with a unique girl. Current theories of questions have, for the most part, ignored the shift from uniqueness to list answers that single and multiple wh questions display. The implicit assumption is that this is a pragmatic effect. Chapter IV, however, takes a close look at the constraints on list answers and argues that they only allow pairings that are one-one or many-one. Crucially, one-many pairings are ruled out. By adapting the functional approach to questions with quantifiers (Engdahl 1986,

Chierchia 1991, 1993) the shift from uniqueness in single wh questions to lists in multiple wh questions is given semantic status.

Briefly, a multiple wh question involves quantification over functions from individuals to individuals, rather than separate quantifications over two individuals. A possible answer is a conjunction of propositions, which exhaustively pair the members in the domain with unique individuals in the range of the function. Number marking on wh expressions determines whether these members will be atomic or plural. This is the same role that number marking plays in single wh questions, where singular wh expressions pick out unique singular individuals while plurals pick out maximal plural individuals. The shift from uniqueness/maximality to lists is thus derived in a principled manner.

Single and multiple wh correlatives, I claim, have a similar semantics and their meaning can be captured by adapting the semantics developed for questions. In the case of multiple wh correlatives, for example, generalized quantifiers are built up over relations between members of the domain and range of the function. Once again, a principled shift from the uniqueness/maximality noted in single wh correlatives like (20a) and multiple pairings associated with multiple wh correlatives like (25a) is achieved.

This chapter also argues that relative clauses functioning as definites are are not unique to South Asian languages. The primary difference between Hindi and English free relatives, for example, is that Hindi correlatives are CP's and cannot appear in argument position due to the CRP. English free relatives are DP's and therefore appear in argument position. This accounts for the fact that English does not have multiple wh free relatives akin to Hindi multiple wh correlatives. Making explicit the connection between my analysis of Hindi correlatives and the analysis of English free relatives in Jacobson (1995), I show that the fundamental parametric variation is in the syntax of correlatives and free relatives. Once this is factored in, the semantics is entirely predictable. A similar connection is made between languages with correlatives and those with internally-headed relatives, such as Quechua, Lakhota or Japanese. It is shown that internally-headed relatives in these languages have properties that can only be explained if uniqueness/maximality is part of their meaning. This chapter thus argues for the universal availability of relative clauses as definites.

Chapter VII draws out the general conclusions based on the investigation of Hindi wh structures. The basic observation is that appearances notwithstanding, wh structures are interpreted close to S-structure representations. In the case of questions, so called long wh movement at LF is shown to be an instance of pied piping of the containing clause. In the case of relative clauses, adjoined clauses are

shown to enter into local relationships. Noun modifiers modify a head that they are adjacent to at D-structure while quantifiers bind variables in their local domain. As such, The evidence presented here argues for a constrained view of LF as the level that mediates between S-structure and interpretation.

3. THEORETICAL ASSUMPTIONS

As is obvious from the preceding discussion, I adopt the syntactic framework of the Principles and Parameters theory to investigate the syntax and semantics of wh constructions. This choice is dictated by the fact that locality effects have been most explicitly studied within this framework. However, the basic concerns of the book carry over to any framework that requires wh expressions to take clausal scope.

Engdahl (1986), for example, uses Linked Trees to interpret wh structures. Clause-initial wh expressions are base-generated in that position and associated with argument positions by linking. Wh in-situ is interpreted using the storage and retrieval mechanisms proposed by Cooper (1983). Her analysis of (1b), for example, involves storing the wh in-situ and retrieving it at the embedded or the matrix clause level. With respect to the scope properties of wh in-situ, then, her position is standard and similar conclusions can be drawn about the relevance of bounding nodes in her system as in Huang's or Chomsky's. The link between clause-initial wh expressions and the variables they bind must obey subjacency, construed of course as a condition on representations, not movement. The retrieval of wh in-situ does not take subjacency into account, and may occur at any clausal level. However, if Hindi wh structures were to be interpreted in this system, some constraint would be needed to ensure that retrieval of wh in-situ occurs at the level of the finite complement in this language. The problem posed by Hindi syntax for a theory of wh quantification is therefore a general one. The typological variation in the scope properties of wh in-situ is going to be at issue in any framework that requires wh expressions to take clausal scope, regardless of the way in which such scope is assigned.

The crucial assumptions for the issues raised in this book have more to do with the map from syntax to semantics. I assume that disambiguated syntactic structures are assigned logical representations which can be interpreted model-theoretically. This implies a close connection between the syntactic and the semantic components, a view that is fairly standard within model-theoretic semantics. The Principle of Compositionality (Frege 1960) requires semantic procedures to be defined systematically on syntactic structures. In spite of earlier discussions about the autonomy of syntax, a necessary connection

between syntactic structure and semantic interpretation is also assumed within current syntactic theory. The principle of Full Interpretation (Chomsky 1986b), for example, enjoins syntactic analyses to be semantically accountable and is fully compatible with Frege's idea of compositionality.

Compositionality imposes rigorous contraints on analyses, requiring as it does the meaning of the whole to be a function of the meaning of its parts. Some of the structures discussed in this book appear to challenge the possibility of a compositional account but I have tried to present solutions that achieve full interpretation in a compositional manner. To the extent that this attempt is successful, I hope that the discussion presented here advances our understanding of the interface between syntax and semantics.