

## ADJUNCTION, FEATURES AND LOCALITY IN SANSKRIT AND HINDI/URDU CORRELATIVES

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### Abstract

Both earliest Sanskrit and the modern Indic language Hindi/Urdu have correlative clauses, in which the modifying, dependent relative clause is not required to be adjoined within the correlate XP, but instead to the whole clause containing XP. The two related but temporally distant languages differ in the adjunction relation of relatives: Sanskrit has symmetric adjunction of CP to CP, Hindi on the other hand has asymmetric adjunction of CP to TP containing the corresponding correlate XP. Asymmetric c-command rules out stacked relatives, non-local coindexing and locality condition violations in Hindi/Urdu, and symmetric adjunction in Sanskrit permits stacked relatives, non-local coindexing and a much looser anaphoric relation between the two finite clauses, as well as interpretations not permitted in Hindi/Urdu. I use these properties to make the case for a base-adjunction analysis, in contrast to analyses requiring movement, bringing to bear data which have not been considered in movement accounts. My analysis uses a semantic feature [PRED] as well as uninterpretable features, including those which establish an anaphoric link of the correlative and its correlate, showing how the grammar of Sanskrit and Hindi differ in small but significant ways.

## 1. Correlative clauses in Indic languages

### 1.1. Correlative clauses in Hindi/Urdu

Hindi/Urdu has correlative clauses, like all the modern Indic languages except for Sinhala. Correlatives in Hindi/Urdu have been much discussed, for example in Subbarao 1984, Dayal 1996, Mahajan 2000, and Bhatt 2003, among others. I will be assuming, descriptively, that correlatives consist of pairs of sentences. One of them, which I will call the *correlative* clause is interpreted as a modifier, and contains a relative determiner and an optional NP (indicated in bold in the examples). The other clause contains a constituent which is modified by the correlative clause. I will call this constituent the *correlate*, using the term in Grosu (2002). In the following sentences, the correlate is given in italics.

- 1) [aap-nee **joo kitaabeeN** kal khariid-iiN] vee khoo ga-ii haiN  
you-erg rel books-**fp** yesterday buy-pf.**fp** 3pl get.lost go-pf.f are  
'The books [which you bought yesterday] are missing.'<sup>1</sup>
- 2) [jis (**kisii**)-nee bhii mujh-see kitaab udhaar lii] us-nee kitaab waapas nahiiN dii  
rel some-erg even I-from book borrow took 3s-erg book back not give-pf.f  
'Whoever borrowed my book did not return it.'

The correlative typically has a restrictive definite interpretation, as in (1). With the addition of

*kooii/kisii* ‘some’ or the emphatic *bhii* ‘even’ to the relative in (2), there is a specific indefinite or generic ‘free’ relative interpretation. Finally, two relative expressions are possible within the same correlative sentence (3), each corresponding to a correlate. In all cases, the interpretation is restrictive.

### 3) Multiple relatives

[**jis-jis sipaahii(i)**-kii **jis-jis caurahee(j)**-par DyuuTii hoo-tii hai]  
 rel-rel policeman-gen rel-rel intersection-on duty be-impf is

[*woo(i)* *is(j)*-kaa zimmedaar hai]

3s-nom 3s-gen responsible is

‘Whichever/the policeman(i) who is on duty at whichever intersection(j), he(i) is responsible for it(j).’

#### 1.1.1. Clause internal and clause external relatives

There are two major variants on relative constructions in Hindi/Urdu.<sup>2</sup> The first is similar to the correlatives in (1), with the difference that the correlative clause follows the clause with the correlate (4). Right adjoined correlatives (4) allow a non-specific indefinite interpretation not possible with (1)-(3).

### 4) Right relative, indefinite

unhooN-nee apnee irdgird *aisaa pardaa* khiiNc liyaa [**jis-kee** piichee vee apnee dard  
 3pl-erg self around such curtain draw take-pf rel-gen behind 3pl self’s pain.pl  
 chipaa sakeeN]

hide be.able-cont.3.pl

[The reviewer here says that *sakeeN* should be glossed as "be-able.Pfv.Fem.Hon". Do you agree with this?] NO, I give just the morphological content of the suffix-eeN, the

contingent 3.pl.

‘She draw around herself a kind of curtain [behind which she could hide her suffering].’  
 (Jayekar 1992)

The second variant is composed of a relative adjoined to the right of an NP. This construction is the main way that an appositive reading is expressed cf. (5a), but this structure can also have a restrictive reading (5b). Left-adjoined correlatives cannot have an appositive reading, as shown in (6).

### 5) a. NP adjoined, appositive relative

*anu(i)* [**joo(i)** khaRii hai] lambii hai.

Anu rel standing is tall is

‘Anu, who is standing, is tall.’ (Dayal 1996, 155)

### b. NP adjoined, restrictive relative

mujhee [*woo aadmii* [**joo (\*aadmii)** siitaa-koo acchaa lag-taa hai]]pasand nahiiN hai

I-dat that man rel man Sita-dat good seem-impf is liked not is

‘I do not like [the man [who Sita likes]].’ (Mahajan 2000, 203)

### 6) Left-adjoined correlative: no appositive reading

\*[**joo(i)** khaRii hai] *anu(i)* lambii hai  
 rel standing is Anu tall is  
 ‘Anu, who is standing, is tall.’ (Dayal 1996, 155)

The NP adjoined relative construction in (5) clearly involves subordination of a finite clause within a matrix clause. The relative clause is adjacent to the NP it modifies, forming a constituent with it. The correlatives in (1)-(4) appear to be peripheral to TP, and adjoined to a clausal category. The relative clause can be linearly separated from the correlate which it modifies (1). While Hindi/Urdu allows clause internal finite clauses (5a,b), it is more usually the case that finite relative clauses are at the left or right periphery of the main clause.

### 1.1.2. A common semantic translation

For those accustomed to NP-headed relatives, correlative structures seem less transparent than NP-headed structures. A clearly subordinated relative clause adjoined to its head very unambiguously singles out in syntactic structure what the modifying clause is, in contrast to the matrix clause. It is also completely clear from surface syntax which NP is modified. But these are parsing considerations not necessarily built into Universal Grammar, which allows various syntactic options besides NP-headed clauses, such as the correlatives discussed here, as well as internally head relative clauses.

The semantic interpretation of both NP-adjoined and correlative structure is a conjunction of propositions sharing a common referent:

- 7) a. NP-adjoined restrictive relative  
 woo [laRkii [**joo** khaRii hai]] lambii hai  
 that girl rel standing is tall is  
 ‘The girl [who is standing] is tall.’ Dayal 1996:152
- b. Translation of (7a)  
 tall’ (s x (girl’(x) & stand’ (x))) (Dayal 1996: 156)<sup>3</sup>
- c. Correlative clause version of (7a)  
 [**joo** laRkii khaRii hai](i) woo(i) lambii hai  
 rel girl standing is 3s tall is  
 ‘[Which girl is standing] she is tall.’ (Dayal 1996: 188-181)
- d. Translation of (7c)  
 tall’ (s x(i) (girl’ (x(i) & stand’ (x(i)))) (Dayal 1996:191)<sup>4</sup>

Note that the translations of both the NP-adjoined and the clause-adjoined relatives are very similar in structure.<sup>5</sup> The clause- adjoined structure of correlatives is closer syntactically to the form of its translation, which in both cases consist of coordinated propositions. I will say more below about how the relative clause, with its internal NP description, is syntactically linked with its correlate, and what the role is of relative and other determiners.

One could argue that there is no inherent or universal preference for NP-headed structures over clause-adjoined correlative structures. Clause adjunction is a free operation of MERGE, not necessarily driven by a need to check features or to discharge theta roles. The placement of modifier clauses are an example of Chomsky’s merger of one XP to another (2004). So I will

assume that there is no a priori reason that languages cannot select either NP-adjoined relatives or clause-adjoined correlatives, or both. I will make the case in this paper that it is not necessary to reduce all relative structures in a language to a single base source, from which other variants are derived by movement. The single-base concept would be more attractive in a theory of syntax which allows D-structure, a well-formed complete syntactic projection from the lexicon in which various conditions must be met. But with the absence of D-structure, a Minimalist theory can derive syntactic objects of many sorts, subject to interface conditions such as Full Interpretation.

## 1.2. Old Indic correlative clauses

In this paper, I will be comparing Hindi/Urdu and Sanskrit, in which the forms of relative clauses are very similar, particularly the lexical forms used for marking relative and interrogative clauses. Correlative clause are found in the earliest form of Sanskrit, the language of the religious poetry and prose of the Vedic era, and the later Classical period. Correlatives have a restrictive interpretation (8), and a ‘free relative’ interpretation as in (9). There are also multiple relatives within one clause (10):

### 8) Restrictive

[**yás** tán ná véda ] kím rcI kari?yati  
 rel-nom that.acc not know.pres.3s what.int.acc verses.inst do.fut.3s  
 ‘[The one who does not know this] what will (*he*) do with the Verses?’  
 R.V. 1.164.39c, Etter 1985, 167<sup>6</sup>

### 9) ‘Free’, universal interpretation

[**yád** im usmási kár-tave] karat tát  
 what.rel.acc he.acc be.eager.pres.1pl do-inf do.pres.3s that.acc  
 ‘[What(i) we are eager for him to do t], he does that(i)’ R.V. 10.74.6, Hettrich 1988, 273

### 10) Multiple relatives

[**ya?(i)** svabhavo hi **yasya(j)** syat] [*tasya(j) asau(i) duratikrama?*  
 rel.nom nature.nom ptcl rel.gen be.opt.3s that.gen that.nom difficult.nom  
 ‘[Who has what nature], *it* is difficult for *him* (to overcome).’ Hit. 3.8, Hock 1989, 96.

The interpretations found in Hindi/Urdu correlatives (1)-(3) above also have counterparts in Sanskrit. But Sanskrit is less restrictive than the modern language. Among other differences, there is an appositive reading for some left-adjoined correlatives ? compared with (6):

### 11) a. Initial appositive relative clause

[ **yó** gmata ím íd aṣṭha-  
 rel.nom sing.part.gen.pl ptcl be.impf.middle.2s  
 apír uti´ sívá? sákha ]  
 ally.nom favor.inst auspicious.inst familiars ]  
 sá tvám ná indra mṛlaya  
 ptcl you.nom we.dat Indra.voc be.gracious.caus.imper.2s

‘You who have become the good friend of the Singers with your favor to your familiars be merciful to us, O Indra.’ RV 6.45.17, Hettrich 1988, 639.

There is a striking absence in Sanskrit of evidence for the NP adjoined relative. Examples such as (12 a) which could be seen as NP adjoined are just as easily seen as clauses adjoined to the left or right of a full clause.<sup>7</sup> The initial relative pronoun is (only) linearly adjacent to the correlate.

12) Headed or adjoined relative

a. ná mr̥ṣa [srantam [yád avanti deva ?]]  
not useless pain rel.acc favor.pres.3pl gods.nom.pl  
‘The [pain [which the gods favor \_\_\_]] is not useless.’ (Hettrich 1988, 541)

Hettrich includes a number of examples such as (12), in which the relative pronoun immediately follows the head N. It is not clear that the relative clause is adjoined to the preceding NP. It could equally well be adjoined to the preceding CP, as in (12b)

12) b. [ná mr̥ṣa srantam ] [yád avanti deva ?]  
not useless pain rel-acc favor.pres.3pl gods.nom.pl  
‘[The pain is not useless] [which the gods favor.]’

Hock (1989: 111-2) offers a compelling argument against the (12a) structure in Vedic Sanskrit. What appears to be examples of NP-adjoined structures are plausibly analyzed as relative adjunction to a clause with an initial nominal phrase (12b). Hock finds that the small number of examples of relative clauses wholly contained within a clause turn out to have other explanations, such as parenthetical phrases in apposition, to the left or right of the correlative element.

It is not clear where the ‘head’ N must be in Sanskrit relative constructions. The nominal head can appear freely in either the relative or the host clause, or in both, although there is a clear tendency for N to occur in the first clause in linear order (Hettrich 1988). This pattern would seem to be motivated by discourse conditions rather than syntactic structure. If so, then the NP adjunction source for correlatives is absent and we can assume that correlative clauses are base adjoined to another clause in Sanskrit.

## 2. A base adjunction analysis

The base-adjunction view of correlative clauses has been discussed in various analyses, such as Andrews 1976/1986, McCawley 2004 and Dayal 1996. It seems to be something of a minority view, given the rich pool of knowledge of displacement processes and the constraints on them. My discussion will add a historical perspective, examining the syntax of correlatives in Sanskrit, which represents what we know of the earliest stages of Indic. I will argue that Sanskrit did not express syntactic subordination of finite clauses, though non-finite clauses are subordinate and clause internal. It will also take into account some aspects of correlative clauses which have not emerged from movement analyses based on correlative clause extraction from DP.

The main difference between correlatives in Sanskrit and modern Indic languages lies in the syntactic adjunction relation: in the modern language the adjunction syntactically encodes subordination, while in Sanskrit it does not. There are some interesting interpretative and locality differences which, I argue, follow ultimately from this syntactic difference. The discussion will show that the syntax is coupled with the semantic properties of relative determiners, expressed as features building an anaphoric link between the modifier clause and the correlate which it modifies. It does not appear that movement rules are at all involved in the derivation of Sanskrit correlatives, while they might be involved in Hindi/Urdu. But the crucial difference is in the adjunction relation, not in the availability of movement.

This section begins with an overview of Sanskrit relative clauses, which are always clause adjoined, not NP adjoined. I then propose that Sanskrit correlative CPs are symmetrically adjoined to CP, in contrast to Hindi/Urdu, which has asymmetric, subordinating adjunction of correlative CPs to TP. This difference of structure is supported by differences of clausal architecture, the range of possible interpretations of correlatives, minimality of question scope, and possible iterations of adjunction. In particular, Hindi/Urdu multiple relatives are locally adjoined and constrained by a condition on asymmetric c-command which does not hold for Sanskrit. I outline the case for saying that all correlatives are base-adjoined, rather than extracted from a clause-internal DP. Evidence is given for the fundamentally anaphoric nature of correlatives, which is a central part of my formal analysis using syntactic and semantic features. I conclude with a note on the core difference between Sanskrit and Hindi/Urdu correlatives.

## 2.1. Symmetric and asymmetric adjunction of correlative clauses

In this section, I discuss the two possible structures for adjoining correlative clauses to a host clause. The difference between the two is in the clausal category of the host clause, CP or TP, and in the projecting category (Chomsky 2004). For Sanskrit, I follow Hock (1989) in giving correlatives the structure in (13).

13) [Symmetric adjunction to another clause] (Hock 1989)

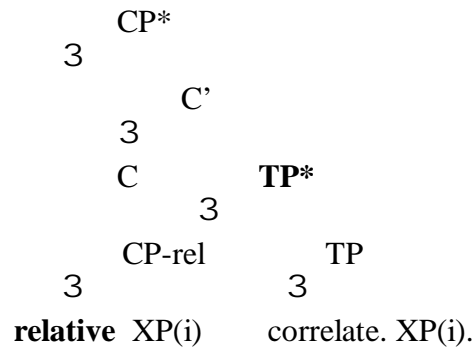
a.	CP	b.	CP
	3		3
	CP1[Rel]		CP1
	<b>Relative XP</b>		Correlate XP
	correlate XP		CP2[rel]
			<b>Relative XP</b>

It has long been observed that clauses in Sanskrit seem to be linked in a very loose paratactic way, without syntactic encoding of subordination (for example by Delbrück (1888), Hermann 1895, Gonda 1975, Hettrich 1988). Hock (1989) uses a formal syntactic representation to express this relation, the symmetric adjunction of a full clausal projection to another full clausal projection, which I express as in (13). A correlative may precede or follow another full clause. It is unclear exactly which CP projects, given that all the categories are CPs. Each CP c-commands the constituents of the other clause: while the relative CP c-commands its correlate, the correlate CP also c-commands the relative phrase.

By contrast, for Hindi/Urdu, I propose a different adjunction structure (14). In this structure, the correlative CP is adjoined to TP, not to CP. The TP is the category which projects, as TP\*.

The adjunction structure TP\* is the complement of its own CP\* projection. This is a base adjoined structure (cf. Dayal 1996, McCawley 2004). There is an *asymmetric* relation, in that the subordinate correlative clause does not project in category. It c-commands the constituents of TP, including the correlate linked to the correlative. The correlate TP does not c-command the relative XP, for which evidence will be given in sections 2.2.4-2.2.6 and 2.3 below.

14) [Asymmetric adjunction]



I will argue that the two structures explain some systematic and striking differences between correlatives in the two languages. Interestingly, there is evidence from Dutch comparative correlatives (Den Dikken, this volume) that both kinds of adjunction can coexist in one language. Embedded examples of comparative correlatives are marked with the finite complementizer *dat* 'that'. The presence of the overt complementizer on the two-clause combination shows that the structure is identical to (14), with the correlative adjoined to TP. In unembedded contexts, CP is adjoined to CP (cf. 13), and a complementizer is possible within the host clause as well as the correlative.

## 2.2. Sanskrit-Hindi/Urdu finite clause combining strategies

(maybe a better title here would be: 'Sanskrit and Hindi/Urdu clause combining strategies' -- there is more discussed in this section than just finite clause differences) THIS IS A GOOD SUGGESTION

In this section I review evidence that Sanskrit and Hindi/Urdu differ in the adjunction relation between the correlative clause and the 'host' clause, leading to the conclusion that Sanskrit does not syntactically encode subordination for finite clauses, while Hindi/Urdu does, with consequences for interpretation and locality constraints.

### 2.2.1 Nonfinite clauses

Sanskrit does encode non-finite clauses syntactically. For example, the Raising/ECM construction in (15) shows syntactic subordination. In both Sanskrit and Hindi/Urdu (15b), the matrix verb 'see' selects a participle subordinate clause with an accusative subject:

(15) Exceptional Case Marking/Raising to Object

a. [Sanskrit]

arunó [ **ma** sakr̥ḍ vrka? **patha ? yántam** ] dadársa hí  
reddish.nom 1s.acc once wolf.nom path.inst go.impf.acc see.pf.3s ptcl  
'On one occasion a reddish wolf saw [me going along the road].'

RV 1.105.18a, Hettrich (1988), 178.

b. [Hindi]

eek bheeRiyee-nee [hameeN jaNgal-meeN jaa-tee hu-ee] deekh-aa  
one wolf-erg we.dat forest-in go-impf be-pf see-pf  
'A wolf saw [us walking in the forest].'

Sanskrit has control infinitive subordinate clauses of many sorts, including object control in (15a). This must mean that there is clear evidence for case selection, selection of a non-finite verb form, and a controlled null embedded clause subject, very much like in the modern Indic languages. In the next sections, I will note some very different properties of the finite clauses in Sanskrit and Hindi/Urdu.

### 2.2.2 Sanskrit clause architecture: the Clause Initial String and markers of subordination

In this section, I note the first of several aspects of finite clauses which fail to distinguish subordinate clauses from matrix clauses. A distinctive prefix to finite clauses is found in several very old Indo-European languages, including Sanskrit (Hock 1989, Schäufele 1990) and Avestan, Old Persian (Hale 1988). This is a string of head positions occupied by particles and pronouns, which occupy up to five ordered positions in the left periphery of the CP (16).

16) Vedic clause-initial string positions (Hock 1989, 115)

Nexus	1	2	3	4	5
conjunction	accented	unaccented	accented	enclitic	stressed
eg. <i>atha</i> 'so'	word	particle	particle	pronoun	pronominal
	[Rel, Int]				

Evidence that this clause initial string involves CP projections comes from the nature of the particles, which are sentence oriented.

17) [Sanskrit] Sentence-oriented particles:

- Unaccented: *u* 'and', *sma* 'always, indeed', *ha* 'certainly'
- Accented: *tú* 'then', *vaí* 'truly, indeed', now, furthermore, surely'

In the string relative and interrogative determiners must appear as single words. They may be moved away from their DP, leaving a remnant NP (Schäufele 1990). The clause-initial string seems to be characteristic of an independent clause, because it contains sentence-oriented particles. Yet the clause initial string is found not just in the independent 'correlate' clause, but also in the correlative clause as well (18). The presence of the clause initial string in *both* clauses of (18) is another indication of symmetric adjunction (Hock 1989).

18) [Sanskrit] Clause initial string in both clauses

[**yám(i) u ha evá** tát pasávo manusyèsu ~~yam~~ kamam(i) ároha? s]  
Rel.acc ptcl ptcl ptcl that cattle.pl.nom man.pl.loc rel.acc desire.acc obtain.pres.3pl  
[**tám(i) u ha evá** pasú?u ~~tam~~ kama? (i) rohati]  
that-acc ptcl ptcl ptcl cattle-pl-loc that-acc desire-acc obtain-pres-3s  
'The desire which(i) the cattle obtained among men, he obtains the same desire(i) among  
the cattle.' S.B. 2.1.2.7 Hock 1989, 111.

Note that the determiners *yam* 'relative' and *tam* 'that' have been moved away from NP in both clauses, a freely available combination.. **Determiner movement and the string of particles are possible marked in main or dependent clauses in Hindi/Urdu**.

(There was a comment by the reviewer, in the light of which this sentence might need some modification: "strictly speaking it is not true that wh-determiners cannot be separated from NPs in H-U. Cf.

But yes, the tendency is a marked one in H-U unlike Sanskrit where I take it it was more easily available.) **See new footnote 8**

### 2.2.3 No syntactically subordinate complement clauses in Sanskrit

The next section offers another example of the absence of syntactic subordination in Sanskrit. Interrogative subordinate clauses cannot be marked as interrogative. In both languages, main clause interrogative sentences are marked by the k- series of determiners, which are distinct in form from the y-/j- series which are specific to relative clauses in both Sanskrit and modern Indic languages. Yes/no questions are prefixed by 'what.int' cf. (19).

19) [Sanskrit] Yes/no question

**kád** aryamno mahás patha ? áti kramema dud.hyo  
what.int Aryaman.gen great.gen road..inst surpass.opt.1pl inferior.pl.acc  
'Should we overcome the base people on the path of the great Aryaman?  
R.V. I. 105.6cd, Etter 1985, 125.

20) [Sanskrit] Constituent question

**kó** dadarsa [prathamá? ja ŷamanam]?  
Who.int see.perf.3s first.ms.acc born.ms.acc  
'Who has seen [(him) as first born]?' R.V. I. 164. 4a, Etter 1985, 66.

If a question is in a dependent complement clause, Vedic Sanskrit substitutes a relative y-determiner for the k- interrogative in both yes-no questions (21) and constituent questions (22):

21) [Sanskrit] Complement yes/no question

ná tásya vidma **tád** u sú prá vocata  
not this.gen know.pres.1pl this.acc ptcl good forth speak.imper.2pl  
[*yúva* *ha yád* *yuvatya?* *kséti* *yóni?u*]  
youth.m-nom ptcl what.rel young.girl.gen lie.pres.3s womb.loc.pl

‘We do not know of this, tell us well [**whether** the young man lies in the lap of the young girl.’ R.V. 40.11ab, Etter 1985, 210.

22) [Sanskrit] Complement constituent question

na ħám tád bhagavan veda [yátra gami?yami]

not- I this.acc Lord.voc know.pres.1s where.rel go.fut.1s

‘I do not know, O Lord, [**where** I will go] S.B. 14.6.11.1, Hettrich 1988, 524.

This pattern is found in Homeric Greek (Chantraine 1958), and disappears in both Classical Greek and later Sanskrit. Nothing like (21)-(22) is possible in Hindi/Urdu (23).

23) ham-nee (yah) puuch-aa [ki kahaaN/ \*jahaaN vee aa-eeNgee]  
 we-erg this ask-pf that where.int/\*where.rel 3pl come-fut-3plm  
 ‘We asked [*where.int* they will come].’

Sanskrit has several ways of marking sentential complements: (a) parataxis of the selected complement clause, (b) prefixation or suffixation of the quotative *iti* ‘thus’ (Hock 1982), or else (c) the interrogative complement is put in relative form, with an interrogative interpretation. The predicate selecting the complement determines whether it is an embedded question or not (Lahiri 2002). Sanskrit does express a selectional relation, but this selectional relation can be expressed in Vedic Sanskrit only by the very general CP-CP adjunction licensed by the relative form of one of the clauses. Hindi/Urdu has an available marker of subordination (*ki*) which marks interrogative as well as other complement types as syntactically distinct from main clauses.

#### 2.2.4 Minimality violations in questions and relative clauses

Minimality violations include violations of the Complex NP condition, in which a questioned phrase cannot be extracted from a relative clause in languages like English and Italian (Rizzi 1990). Analogues of Minimality violations occur in Hindi/Urdu if a question phrase is within a correlative clause, and the whole combination has the force of an interrogative sentence.

Well-formed sentences, on the other hand, are found which have the force of a question, but the questioned phrase is in the matrix clause. The correlative clause is within the scope of the question. Such sentences are found in both Sanskrit and Hindi/Urdu.

24) Minimality contrast in Hindi

a. Interrogative in main clause

[joo kitaab(i) us-nee t(i) likh-ii hai] woo kis-koo(j) sab-see acchii lag-ii?  
 rel book 3s-erg write-pf is 3s who.int-dat all-from good strike-pf  
 ‘Who likes best the book [that he/she wrote\_\_\_]?’

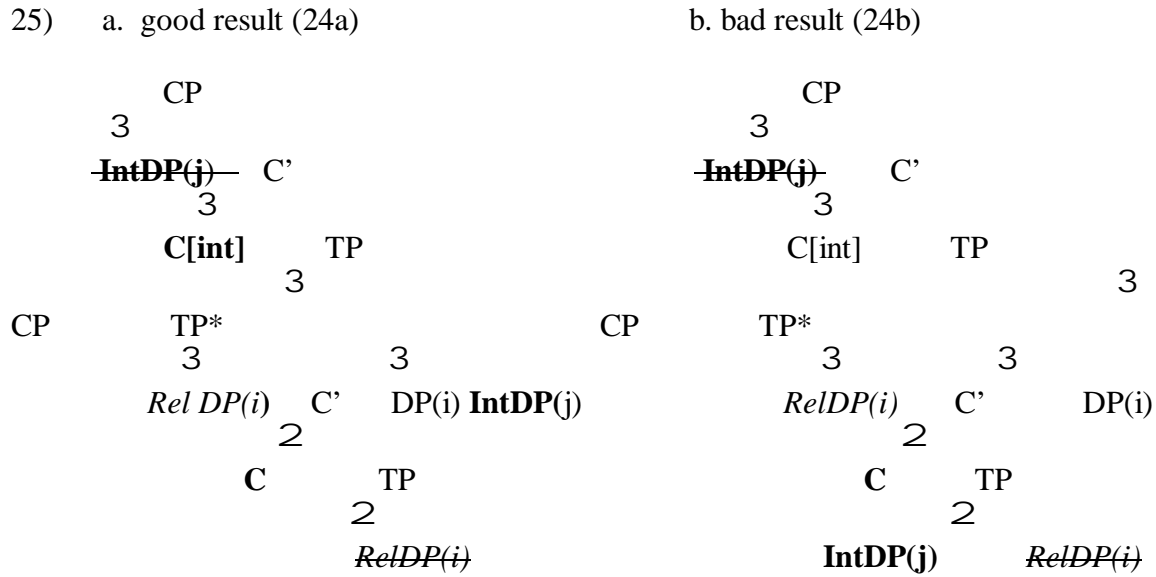
b. Interrogative in relative clause

\*[joo kitaab(i) kis-nee (j) t(i) likh-ii hai] woo aap-koo sab-see acchii lag-ii/?  
 rel book who.int-erg write-pf is 3s[nom] you-dat all-from good strike-pf  
 \*‘Who did you like best the book [that \_\_\_ wrote\_\_\_]?’

Note that in (24)a, the whole clause projects as a question, and the restrictive relative is

interpreted inside the scope of the question. Otherwise the correlative could be adjoined to CP[int] and the relative meaning would be outside the scope of the question, like an appositive clause.

This contrast in Hindi/Urdu supports the assumption that the relative CP must be adjoined to TP, not the matrix CP, in the asymmetric adjunction structure proposed above in (14). The contrast can be represented structurally in (25), assuming the clause-typing features [Rel] and [Int] on C.



In the well-formed version, (24)a, the relative DP(i) has a copy in the nearest CP projection, which is typed as a relative clause.<sup>9</sup> The relative clause is adjoined to TP\*, containing an interrogative in situ. The TP structure is the complement of a C[Interrogative], with a copy of the interrogative phrase DP(j) in its specifier. This specifier is the closest such position to the interrogative DP. It conforms to Rizzi's (1990) Minimality requirement.

In the ill-formed version (24)b, both the relative DP(i) and the interrogative DP(j) originate in the same TP, which projects as a relative clause. Nothing is wrong with the relation between the relative specifier(i) and the relative DP(i); this is the closest specifier position. But the interrogative DP(j) is copied to a Spec position which is not the closest to it, as the relative specifier with DP(i) intervenes.

Sanskrit appears not to have a minimality contrast, observe (26). CP is adjoined to CP, not TP, in the symmetric adjunction structure. Either CP could be a question, and either one could be a relative clause. In principle, the normal case in Sanskrit should be like (24a) in Hindi/Urdu, in which one CP is a relative clause, the other is a question, as in (26a). There is, however, a striking example, first noted in Delbrück (1888), in which one clause is both a relative and a question, on the order of the ungrammatical (24b).

- 26) [Sanskrit] Absence of Minimality contrast  
a. Interrogative in main clause

[**yás** tán ná véda ] *kím* r̥ca ́ kari?yati  
 rel.nom that.acc not know.pres.3s what.int.acc verses.inst do.fut.3s  
 '[The one who does not know this] what will (he) do with the Verses? R.V. 1.164.39c,  
 Etter 1985, 167

b. Interrogative in relative clause:

[**yát** *kím* ákara? ] [**tásmad** idám a ́pad(i)  
 what.rel what.int.acc do.aor.1s that.abl this.nom befall.aor.3s  
 [Because(i) I have done what.int] therefore(i) this (j)has happened, or  
 '\*What did [for which reason(i) I did \_\_\_], for that reason(i) this(j) befall.  
 = That happened [because of what.int that I did]. S.B. 4.1.5.4, Delbrück 1888, 550,  
 Hock 1989, 105

The sentence in (26b) is very marked, and a challenge to translate into any modern language with a Minimality requirement.<sup>10</sup> Yet it appears to be grammatical, and with some reservations we can assume it represents a rare but occurring sentence type. It constitutes a Minimality violation shown schematically in (27):

27) Minimality violation: **yát(i)** *kim(j)* **t(i)** t(j)

Representing the structure of (26b) is difficult under the older assumptions that both relative and interrogative operators move to the same Specifier of CP, as in Chomsky (1995) and earlier work which assumes a single COMP position. A way to separate the operator positions of relatives and questions can be found in Rizzi's (1997) proposal which has it that a CP projection may in fact be a series of related but semantically distinct functional projections. The functional heads include Force, the site of relative operators, and in some languages, the position of an overt marker of subordination like *that*. They also include Finite, where interrogative operators are found. In between are Focus and Topic heads.<sup>11</sup> Now, to show CP adjunction to CP, in which one CP has both relative and interrogative properties, let us assume the following structure for (26b):

28) [Sanskrit]

	FP		FP= Force Phrase, FINP = Finite P
	a 3		
	<b>FP(1)</b>		FP2)
3		3	
<b>yát(i)</b>	F'	<b>tásmad(i)</b>	F'
which [Rel] 3		that.abl 3	
Force	FINP	Force	TopP
	3		3
<i>kim(j)</i>	Fin'	<i>idam(k)</i>	Top'
what[Int] 3		that 3	
	Finite[Int]	TP	Topic TP
	<b>yát(i)</b> <i>kim(j)</i> akaram	<b>tásmad(i)</b> <i>idam</i> (k) a ́pad(i)	

what.rel what.int do.aor.1s that.abl this befall.aor.3s

There is a Minimality violation in FP(1), and also in FP(2) depending on whether Topic involves operators or not. These violations seem to be tolerated in Sanskrit. Structurally, the minimality violations in FP occur internally to FP. (28) is different from (25b), in that the relative maximal CP in (28) (FP1) is not adjoined within the syntactic domain of the interrogative, the relationship which is forced in (25b) by the Hindi/Urdu requirement that CP be adjoined to TP.

There is a tempting parallel which I would like to suggest between the Rizzi projections in (28) and the clause-initial string noted above for Sanskrit finite clauses. Note that both of the adjoined clauses have initial strings of pronouns and determiners, recalling the clause-initial string discussed earlier. It is interesting to speculate that the clause-initial string actually is a version of Rizzi's Left Periphery, with the differences that only the first position may have a maximal projection in its specifier, the following head positions may be filled with only  $X^0$  projections, and the head positions are not absolutely specified semantically. A full justification of this idea is beyond the scope of this paper, but if there are such parallels, then the finite clauses of the oldest Indo-European languages are not so utterly unlike the corresponding clauses of modern languages, and there is a resolution to the debate among Hale (1987), Kiparsky (1994) and Hock (1989) about whether the left Periphery includes Topic, COMP and wh-phrases.

The ancient and modern languages actually differ in clausal structure, in that modern languages do not have the clause-initial string, filled by heads. In the modern languages, the Rizzi CP projections allow XP specifiers. In any case, we see a difference in grammaticality in relative clause structures between Sanskrit and Hindi/Urdu which can be explained by a difference of symmetric and asymmetric adjunction. If this difference did not exist, we could expect that full CP relative clauses in Sanskrit could adjoin lower down, within the clause initial string, either on TP or on NP. But if the relative CP as a phrase adjoined to TP, the lowest clausal functional projection, the relative clause would be preceded by the particles and pronouns of the clause-initial string, an impossible order in Sanskrit. Relative clauses are peripheral, adjoined to the outermost clausal projection.<sup>12</sup>

### 2.2.5 The stacking condition on Hindi correlatives

As adjunction is a free possibility of MERGE, there is no reason in principle why restrictive relative clauses should not iterate in a 'stacked' structure, consisting of two or more clauses modifying the same DP. This is possible for English, and other languages with NP adjoined relative clauses, but not for correlatives. So sentences like (29a), and (29b) as well for some speakers, are ungrammatical. This fact seems to be a general property of correlatives (Grosu 2002, Den Dikken 2005).

29) a. [Hindi] Stacked relatives on the left

\* [joo laRkii(i) skuul-meeN mehnat kartii hai], [joo(i) anu-kii doost hai]  
 rel girl school-in effort do-impf is rel Anu-gen friend is  
 woo(i) bahut acchii hai  
 3s very good is

'That girl is very nice who works hard in school who is a friend of Anu.' (Grosu 2002)

b. [Hindi] Stacked relatives on the right

(\*) woo laRkii(i) bahut acchii hai, [joo(i) skuul-meeN mehnat kar-tii hai]  
 that girl very good is who school-in effort do-impf is  
 [joo(i) anu-kii doost hai]  
 rel Anu-gen friend is  
 ‘That girl is very nice who works hard in school who is a friend of Anu.’ (Ibid)

Stacked correlatives are quite ungrammatical in Hindi/Urdu, and can only be saved by inserting an overt conjunction like *aur* ‘and’ between the two relatives. But stacking seems to be quite usual in Sanskrit, even with restrictive correlatives:<sup>13</sup>

30) [Sanskrit]

a. Stacked initial restrictive relatives (with verb gapping)

[yá?(i) surya? yá?(i) usása? jaja ína  
 rel.nom sun.acc rel.nom dawn.acc create.pf.3s

[yó(i) apa? neta ´ sá(i) janasa indra?

Rel.nom water.gen.pl leader.nom that.nom people.voc Indra.nom

lit. ‘Who-rel created the sun, who-rel created the dawn, who-rel is leader of the waters, that, O people, is Indra.’ R.V. 2, 12.7c, Hettrich 1988, 544

‘That one who made the sun, who made the dawn, who is the leader of the waters, O people, is Indra.’

b. Stacked initial restrictive correlatives (full verbs)

[yám(i) agne pṛtsú mártiyam]  
 rel.acc Agni.voc battle.loc.pl mortal.acc

[áva va jē?u yám(i) juna ?]  
 aid.aor.2s contest.loc.pl rel.acc urge.on..aor.2s

[sá(i) yánta sásvatir ísa?]  
 That.nom leader.nom steady.nom strong.nom

‘[Which mortal(i) you aided in battles, Agni][whom(i) you urged on in struggles] [that one(i) is the leader, steady (and) strong].’ R.V. 1.27.7, Hettrich 1988, 542.

c. Initial appositive relative clause

[ yó gmatam íd a ´sitha-  
 rel.nom.s sing.part.gen.pl ptcl be.impf.middle.2s

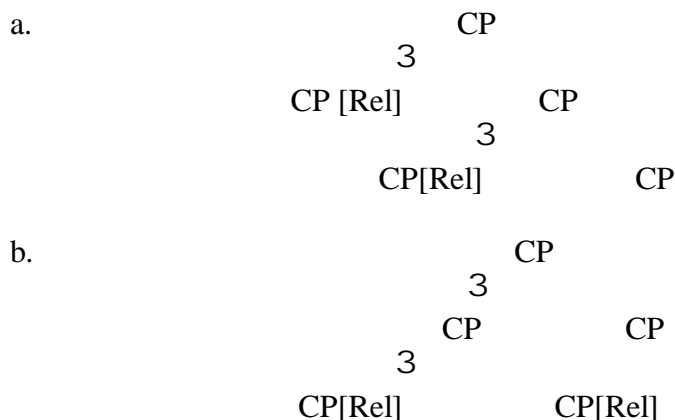
apír uti ´ siva? sákha ]  
 ally.nom favor.inst auspicious.inst familiars

sá tvám ná indra mrlaya  
 ptcl you.nom we.dat Indra.nom be.gracious.caus.imper.2s

‘O Indra, who has become the good friend of the Singers with your favor to your familiars, you be merciful to us.’ RV 6.45.17, Hettrich 1988, 639.

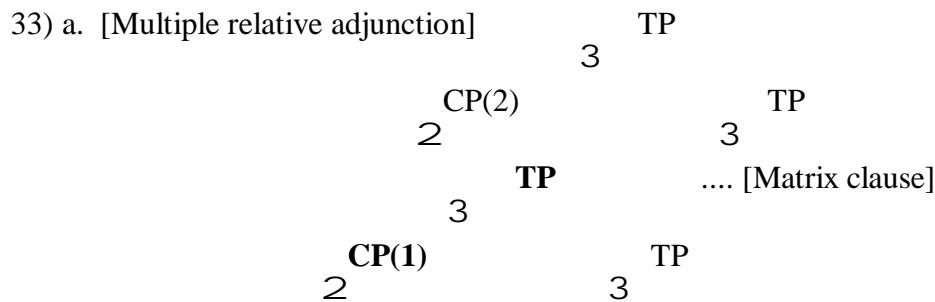
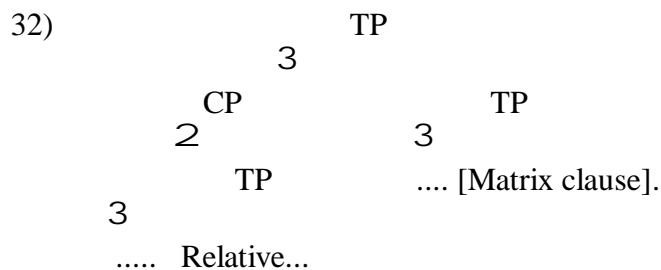
If I am right about the symmetric adjunction structure in Sanskrit, then multiple symmetric adjunction would look like the tree diagrams in (31a,b).

31) Multiple symmetric adjunction



For Hindi/Urdu, I will propose that multiple relative clauses are adjoined as in (33). Dayal 1996 notes that this structure is similar to the structure proposed by Jacobson for English DP adjoined multiple relatives which then undergo extraposition (Jacobson 1983/4) That is, instead of adjoining both of the relative CPs to a single TP, each relative is adjoined to the following relative, and the combination is adjoined to TP.

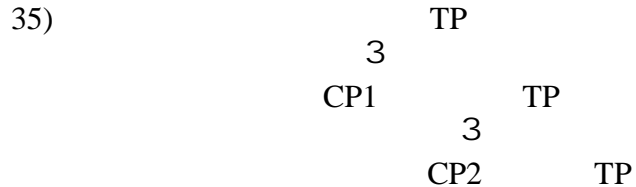
This can be seen if we compare single clause adjunction in (32) to successive adjunction in (33)a, b. Below I will argue that the correct structure for multiple adjunction is the one in (33a). The first relative clause in the sequence is represented in bold in (33); it is adjoined to the TP of the second relative clause CP. As I propose below, this structure distinguishes between well-formed multiple relatives from ill-formed ones in Hindi/Urdu.





the adjunction structure. See discussion below of anaphoric construal conditions on the relative and its correlate.

I conclude this section with a comment on my proposal that adjunction is successively local, as in the structure (33). An alternative structure which derives the same linear order would involve adjunction of both relative clauses to the same matrix TP, as in (35):



I will argue below that this cannot be the right structure, whether derived by base adjunction or movement. It does not discriminate between grammatical and ungrammatical iterated relative clauses, or explain the absence of stacked correlatives without a special stipulation ‘don’t adjoin twice’. Jacobson 1983 argues against the analogue of this stacking structure for English on empirical grounds, as I will for Hindi/Urdu: it does not correctly predict grammaticality differences. So far no theoretical constraint rules out (35), but see note 16.

### 2.2.6 Iterated restrictive correlative clauses

The local c-command condition appears also when correlative clauses iterate, a marked but possible option in Indic languages. One restrictive clause finds its correlate in a TP, and in this TP a referentially distinct second relative phrase is introduced. The second relative finds its correlate in another TP. This pattern was noted independently by Dasgupta (1980, 334-349), Hock (1989) and McCawley (1994/2004); below I cite McCawley’s examples. Because these sentences are very complex and not easy to process either by the reader, or by native speakers, I tag each clause with a roman number, which is then repeated in a summary of the sentence showing the coindexing in it.

In Hindi/Urdu, there is a contrast of grammaticality between the well-formed sentence (36), schematized as (37), and the ill-formed sentence (38), schematized as (39):

- 36) [Hindi/Urdu]  
 [I] **joo aadmii(i)** caay pii rahaa hai ]  
 which man tea drink prog is  
 [II][maiN **jis makaan(j)** -meeN us-kee liyee(i) kaam kar rahaa huuN  
 I which house-in 3s-for work do prog am  
 [III] [raam pichlee saal **wahaaN(j)** rah-taa thaa]  
 Ram last year there stay-impf was  
 ‘Ram was living in the house where I am doing work for the man who is drinking tea.’ (McCawley 2004, 307; ? or ?? for some speakers)
- 37) a. [I] [joo aadmii(i) ] [II] [us-ke liyee(i)  
 b. [II] [jis makaan(j) ] [III] [wahaaN(j)]
- 38) [Hindi/Urdu]  
 \* [I] **joo aadmii(i)** caay pii rahaa hai]

rel man tea drink prog is  
 [II] [jis makaan-meeN(j) maiN ab rah-taa huuN]  
 rel house-in I now stay-impf am  
 [III][woo(i) pichlee saal wahaaN(j) rah-taa thaa]  
 3s last year there stay-impf was

‘The man who is drinking tea, he lived last year in the house where I am living now.’  
 (McCawley 2004, 307; \* for all speakers)<sup>16</sup>

- 39) a. \*[I] [joo aadmii(i) ] [III][ woo(i)]  
 b. [II] jis makaan-meeN(j)] [III] wahaaN(j)]

The problem here is that *joo aadmii* ‘which man’ in CP[I] finds its correlate in TP[III], skipping over CP[II].

Let us assume the structure with multiple clausal adjunctions in (33a) rather than (33b). This means that the initial relative clause is adjoined ‘low’ to the following relative clause, rather than to the matrix TP. The whole structure is adjoined to the matrix TP. In the well-formed combination, the first relative clause adjoins to a TP containing its correlate, so that the first relative clause c-commands the TP with the correlate. A new relative is introduced in the second clause, which c-commands the TP containing the second correlate. This configuration corresponds to the grammatical (36)-(37).

In the ungrammatical combination (38)-(39), the first relative clause does not c-command TP containing both correlates. Only the second relative clause c-commands TP. The condition (34) then also guarantees a local relation between the correlative and its correlate. The correlative clause has to be adjoined to the TP containing the correlate.<sup>17</sup>

There is no contrast like this in Sanskrit. As Hock (1989) pointed out, iteration in Sanskrit is much freer than in Hindi/Urdu.

40) [Vedic Sanskrit]

[I] **yo(i)** vai sreyasah. parivesanam avavadati  
 Rel.nom ptcl better.gen food.acc deprecate.pres.3s  
 [II] **yaya(k)** vai sa(j) **tam(i)** artya kamayate  
 Rel.inst ptcl he.nom he.acc affliction.inst afflict.pres.3s  
 [III] **taya(k)** enam(i) ninayati  
 That.inst that.acc afflict.desid.pres.3s

‘Who(i) deprecates the food of his(i) better(j), he(i) is afflicted by him(j) with whatever afflictions (k) he (j) wants to afflict him(i) with.’ J.B. 3.303. Hock 1989, 108.

- 41) a. [I] **yo(i)** [II] tam(i)  
 b. [II] **yaya(k)** [III] taya (k)

The c-command condition is observed in (40)-(41). Each relative clause finds a correlate in the next clause to the right. But equally well-formed sentences are possible both for the initial relative shown here and in other examples in Hock (1989: 107-9), including both initial relatives (42)-(43), as well as final relatives. Their counterparts are ill-formed in Hindi/Urdu.

- 42) [I] *yády(i)* áhainam pra ñcam ácai?ir  
 If.rel motiveless forward gather.aor.2s  
 [II] *yátha(j)* páraca asinaya prʔhato ‘nna ́dyam upaháret  
 So.rel face.other-way sitting.dat back food.etc.acc bring.opt.3s  
 [III] *tádrk(j) tát(i)*  
 That.like that/so  
 lit. ‘If(i) you have gathered it forward without motive, just as if(j) one were to bring food from the back to someone sitting on the other side, so(j) (would) that(i) be’;  
 ‘If you piled the fire altar forward without motive, that would be as if one were to bring food from the back to someone sitting (and looking away).’ S.B. 10.5.5.2, Hock 1989, 107.

- 43) a. [I] *yády(i)* [III] *tát(i)*  
 b. [II] *yátha(j)* [III] *tádrk(j)*

Here the local linking is not observed; [II] with its relative phrase intervenes between *yady* ‘if’ and *tat* ‘that’.

The free iteration of relatives seems to follow from a much less strict condition on relative-correlate construal. Discourse anaphoric links hold between relatives and their correlates, freely cutting across CP clause boundaries, not constrained by the asymmetric c-command condition (34). A condition of this sort would have no effect applied to symmetric adjunction structures. Neither clause is syntactically differentiated as the modifying clause. Instead the relative is only marked lexically as subordinate, because it contains a relative determiner.

### 2.2.7 Syntactic conditions on adjunction structures in Hindi/Urdu

I have proposed for Hindi/Urdu a c-command condition (34) which constrains iterated correlatives of two types: stacked relatives modifying the same DP, and chains of relative and correlative links. This condition rules out both the stacked correlatives and the ill-formed combination of two correlatives each linked to the correlate in the matrix clause. In each case, there is a relative clause which does not asymmetrically c-command its correlate in TP.

It is interesting that there is also a semantic explanation for the absence of stacked correlatives. The correlative constructions discussed in Grosu (2002) all prohibit stacking. Grosu derives this property from the definiteness feature [MAX] which is added to clauses with predicational effect, such as relative clauses. The [MAX] feature of correlatives should produce exactly one singleton set for each relative--correlate combination. Adding a second property would be semantically vacuous--no additional unique value could be derived. This should be sufficient to rule out stacked correlatives, as only one correlative can contribute information which determines reference.

But this explanation does not carry over to the contrast between good and bad cases of iteration of correlatives, which are examples of successive correlative clauses modifying different correlates. The syntactic explanation (34) seems more general as a condition on well-formed syntactic structures, though clearly [MAX] is involved in the semantic interpretation of

correlatives in all these cases.

### 2.3. Adjunction structures and their consequences

Sanskrit and Hindi/Urdu have correlative clauses, but there are differences of syntax and relative-correlate construal. In this section I have proposed that there is a critical syntactic difference between the relative structures in the two languages, from which many of the differences can be derived. The difference lies in how the relative clause is adjoined to the clause containing the correlate (13)-(14). In Sanskrit, CP is adjoined to CP, forming a categorially symmetric structure, not marking either clause as syntactically subordinate. In general, Sanskrit does not distinguish syntactically subordinate clauses. The clause-initial string of pronouns, determiners and particles is found in both the relative and the correlate clause (18). The relative construction substitutes for interrogative complements. There are fewer constraints than in Hindi/Urdu on interrogative constructions, and on relative clause iterations.

In Hindi/Urdu, the correlative clause is adjoined to the TP containing the correlate. The relative CP is distinguished syntactically as subordinate, due to the fact that it does not project its category. Rather, the host or matrix clause projects as TP, and then as matrix CP, which results in an asymmetric c-command relation between the correlative and its correlate. I propose that this relation is a necessary condition for well-formed construal of the correlative as a modifier of its correlate. This condition takes the form of a condition in (34) which guarantees a ‘local’ relation between a correlative and the correlate which it asymmetrically c-commands. This condition rules out relative clauses which do not c-command the correlate, assuming the adjunction structure in (33), which resembles the structure for stacked relatives in English proposed by Jacobson.

This analysis allows multiple relatives within one clause. In Sanskrit, anaphoric links are established across clause boundaries in a very general way. In Hindi/Urdu, one correlative clause c-commands one TP with multiple correlates, cf. (3) (see Dayal 1996 for an account of the semantics of such clauses). Condition (34) rules out a paradoxical structure resembling the ‘Bach-Peters’ sentences in English:

44) [Hindi/Urdu]

\* [I] [**joo paarTii** (i) *aisaa ummiidwaar(j)* DhuuNDh sak-eegii]  
 rel party            such candidate            search            be-able-fut-3fs

[II] [**jis-kii(j)** *usee(i)*    waaqaaii    zaruurat hai]  
 rel-gen    3s-dat    real            need            is

The party(i) which really needs him(j) will search for the candidate(j) which(j) it(j) needs.’

There are two relative-anaphoric links:

- 45) a. [I] joo paarTii(i) . . . . . [II] usee (i)  
 b. [I] aisaa ummiidwaar (j). . [II] jis(j)

While relative clauses may be adjoined to the left or to the right of the main clause, the structure

of (44) would have to be paradoxical. CP-I would have to be locally adjoined to TP-II, for the anaphoric linking in (45a.). But CP-II would have to be locally adjoined to TP-I for the linking in (45b). Both these requirements cannot be satisfied simultaneously. This kind of paradox is another reason to assume CP adjunction to TP, rather than to another CP, as the paradox would not exist except for the CP-TP difference. This argument predicts that no such paradox should exist in Sanskrit, and indexing relations in (45a,b) should in principle be possible in the same sentence. (In the movement analysis, clause I would be extracted from a right relative clause II extraposed from *aisaa ummiidwaar* ‘such candidate’; presumably this sequence of movement would be prohibited in some way.)

The condition (34) also allows relatives on both the left and right, which are common in Hindi/Urdu (46). There are two correlates in the matrix clause, but no violation of (34)<sup>18</sup>:

46) [Hindi/Urdu] Left and right relatives on the same correlate TP

[I] [jis vidyaarthii(i)-kee nambar sab-see acchee haiN]

rel student gen grades all-than good are

[II] [usee(i) yah puraskaar(j) mil-eegaa]

3s-dat that prize receive-fut-3ms

[III] [joo(j) mukhyaa mantrii vidyaalay-kee saalaanaa mahootsav-par dee-gaa]

rel-dat chief minister college-gen annual ceremony-on give-fut

‘The student(i) who(i) gets the best grades will receive the prize(j) which(j) the chief minister will give at the annual college ceremony.’

About this example, reviewer says the following: "I find 42 very hard to understand - it's alright structurally but there seems to be an extra word in the final relative clause. The relative is supposed to be on "prize" but the RC contains "prize"!!! Was the RC intended to be on "student" - then it would make sense? Here's a rewording of the final RC that makes everything work fine:

vo puraskaar

that prize

[jo mukhya mantrii vidyaalaya-ke saalaanaa mahotsav-par baaNT-te haiN]

Rel chief minister school-Gen yearly function-at distribute-Hab.MPI be.Prs.Pl

which the chief minister distributes at the school's annual function." Do you agree with this

modification suggested by the reviewer? The proposed rewording is not the same structurally as

what I propose, as the example here. Here I have removed the word from my example which

seemed to cause the confusion. The version I gave before came from native speaker who used

the complex predicate ‘give as a prize’ for ‘award’. The use of ‘give’ alone removes the problem

Since the relatives are not adjacent to each other, they can adjoin to TP as in (47).

47)

TP  
3  
TP\* CP Rel III (j)  
3  
CP Rel I(i) TP#  
3  
... DP(i) DP(j) ...

The left correlative adjoins to TP#, while the relative on the right adjoins to TP\*. Both relative CPs c-command their correlates.<sup>19</sup>

I propose that the syntax of correlative clauses Sanskrit and Hindi/Urdu can be characterized by a combination of two factors: (i) the difference of syntactic adjunction and (ii) the asymmetric c-command condition on the relative-correlate construal in (34), which depends on asymmetric adjunction in Hindi/Urdu. These factors explain why some combinations are well-formed, while others are not. This account has taken the adjunction structures as primitives, derived by MERGE without movement (as copying and remerging) applying to the relative clause itself. It is in this respect a version of the base-adjunction analysis which has been proposed in various ways for correlatives.

### 3. The placement of correlative clauses: movement vs. base-generation

In this section I contrast the base-generation hypothesis I have just proposed above with some proposals which derive correlative clauses by movement. There are two different proposals I will discuss briefly, Mahajan 2000 and Bhatt 2003. They differ considerably in details, but what they have in common is that they derive left correlative clauses by movement.

#### 3.1. The Kaynean analysis of relatives (Mahajan 2000)

Mahajan's account starts with a DP in which D is the sister of a CP clause, following the derivation of English headed relatives in Kayne (1994). He uses a series of leftward scrambling and deletion operations, which derives the familiar NP-relative structure, and also a number of other well-formed structures in Hindi/Urdu, including the correlative in left position in the sentence. In both cases, the relative clause starts out as a constituent of the modified DP. The leftward position is derived, not base adjoined as I have suggested.

The derivation of correlatives by movement has no obvious application to Sanskrit. If Hock's (1989) arguments show that there is no unambiguous evidence for nominally adjoined relatives, it would not be available to derive Sanskrit correlatives.<sup>20</sup> The Kaynean DP structure would be plausible for Hindi/Urdu, as it can derive NP-internal relatives as well as single correlatives. But as Mahajan notes, his proposal as it stands does not have an obvious extension to multiple relatives. It remains to be seen how the analysis would derive the properties of left-adjoined relatives such as the no-stacking constraint, the absence of appositive readings, or the well-formed instances of iteration with interlinked relative-correlate pairs. Within its basic assumptions, however, the analysis is very elegant and derives many well-formed outcomes, which need to be accounted for in other theories by phrasal movement.

#### 3.2. The CP-DP analysis (Bhatt 2003)

Bhatt (2003) derives left-adjoined correlatives from a position left-adjoined to DP, forming a relative clause-NP constituent which is grammatical in colloquial Hindi/Urdu (48a).<sup>21</sup>

48) a. rahul [[joo kitaab(i) shiilaa-nee likhii] woo(i) (kitaab)] paRh rahaa hai

- Rahul rel book Shila-erg read-pf that book read prog is  
 'Rahul is reading the book which Shila wrote.' (After Bhatt 2003.)
- b. [joo kitaab(i) shiilaa-nee likhii ] (j) [e(j) woo(i)( kitaab)] rahul paRh rahaa hai  
 rel book Shila-erg read-pf that book Rahul read prog is  
 'Rahul is reading the book which Shila wrote.' (After Bhatt 2003.)

The relative CP is optionally raised overtly to adjoin to TP by Quantifier Raising/A' scrambling (48b). (Some comments on Quantifier raising as a motivation are included in section 6 below). Prosodic conditions account for the options of expressing the noun N in the relative, the main clause or both. Because A' movement is involved, relative clause constructions should be subject to island constraints, reconstruction effects and the Principle C condition, and Bhatt offers examples which make up the most compelling evidence for his proposal. I will discuss these briefly below. I will focus here on the special conditions which must be stipulated to derive the contrasts of grammatical and ungrammatical sentences for which I have proposed a base-generation analysis.

Bhatt (2003) assumes one application of A' scrambling which moves the entire relative clause to adjoin to TP. Correlatives with multiple relatives cannot, however, have a single DP source from which the relative clause is raised, so they are derived by base adjunction to TP. Bhatt proposes an economy principle governing adjunction which places the relative clause as close as possible to the DP which is modified. So single correlatives and multiple relatives have different sources, and should differ in locality conditions (see Bhatt 2003 for examples showing these contrasts).<sup>22</sup>

To derive the no-stacking condition, Bhatt stipulates that only one relative clause may raise by scrambling or Quantifier Raising. He does not specify the syntactic domain in which this stipulation would apply, nor how this restriction would be related to general conditions on scrambling and Quantifier Raising; these processes are normally able to occur multiple times.

It is not clear whether the [MAX] feature in Grosu 2002 would be sufficient to rule out both stacked correlatives and the source of movement, stacked relatives on DP. Bhatt rules out all cases of two relative clauses raising and adjoining to TP, on the basis of ungrammatical sentences like (38) above (Bhatt 2003, 508), which I have analyzed as violating the c-command condition (34).<sup>23</sup>

Bhatt's analysis could be extended with additional provisions to derive the grammatical sentence (36), with the structure (33a). As Aniko Liptak (p.c.) notes, the first relative *joo aadmii caay pii rahaa hai* is generated as a modifier of *us-kee liyee*, then the relative clause adjoins to TP, by some operation of Quantifier Raising. Then this whole TP is turned into a relative clause by MERGE/adjunction to 'which house', by another operation of Quantifier raising. So there is some sequence of operations of Merge and Quantifier Raising which can derive the well-formed (36). The ill-formed version in (38) is ruled out by stipulation, prohibiting two operations of Quantifier Raising out of the same matrix clause. Bhatt offers no independent conceptual justification for it. Also, if there is no 'earliest' principle, it's not clear what prevents the whole complex structure from being generated by adjunction of two modifier DPs in the matrix. Both would undergo Quantifier Raising, generating the ungrammatical version (38).

The analysis I propose for Hindi/Urdu is conceptually simpler, in that it requires a c-command condition filtering the output of an 'earliest' adjunction condition, which adjoins clauses in the

c-command order closest to linear order. This ‘earliest’ condition is highly speculative but it is what distinguishes two kinds of bad combinations from the one good case of iteration. It may ultimately derive from the predicate properties of relative D. My explanation is based on the c-command relation among finite clauses which is found in Hindi/Urdu, but not in Sanskrit. It offers a conceptually simple explanation for the difference in grammaticality between Hindi/Urdu and Sanskrit with respect to iterating correlatives. The DP adjoined sentences which Bhatt assumes as the source of correlatives would have to be treated in my system as relatively marked innovations in the syntax of Hindi/Urdu.] In addition, stacking of relatives with the same correlate would have to be ruled out at the source in DP, by a separate stipulation against more than one relative adjoined to DP.<sup>24</sup>

### 3.3. The construal relation between the correlative clause and the correlate

Correlatives are adjoined to TP in both Bhatt’s analysis of Hindi/Urdu relatives and the one proposed above. Bhatt’s (2003) account derives the structure by A’ movement. This A’ movement could be optional adjunction, or some kind of overt, optional Quantifier Raising, suggested by the fact that left-adjoined correlatives have the semantics of a Generalized Quantifier, incorporating the semantics of a determiner (Dayal 1996). The analysis depends on an economy condition, requiring relatives to be adjoined as low as possible, for example to the modified DP, the phrase which corresponds to the correlate in the examples above. The relation between the relative clause and what it modifies is a sister relation in (49a). The external relative is the head of an A’ chain, whose tail is the deleted copy/trace, and subject to constraints on A’ chains as Bhatt shows.

- 49) a. . . . [CP DP] . . . .  
 b. CP [ . . . . . [CP DP]]

There must also be a local predication relation between CP and DP in (49a), and between DP and the reconstructed CP in (49b) (cf. Safir 1986).

There is a restriction on adjunction to DP (Bhatt 2003: 493ff): the quantifier in DP must belong to a set which excludes indefinites. Without this constraint, left-adjoined correlatives would be ungrammatical (see section 5.2 below). Left correlatives cannot be directly construed with indefinites (50a) (Subbarao 1984, Dayal 1996:160ff):

- (50) a. \*[**joo laRkiyaaN** khaRii haiN] *doo* lambii haiN  
 rel girls standing are two tall are  
 ‘[Which girls are standing] two are tall.’ (Dayal 1996:160)  
 b. [**joo laRkiyaaN** khaRii haiN] *un-meeN-see doo* lambii haiN  
 rel girls standing are 3pl-in-from two tall are  
 ‘[Which girls are standing] two of them are tall; two girls who are standing are tall.’  
 (Dayal 1996:161)

In the grammatical sentence (50b), the correlate is a pronoun within DP. In Bhatt’s derived structure, the relative clause would have to be adjoined within a PP within DP; it would be a

sister of a pronoun in PP. In order to rule out ungrammatical correlatives as in (50a), a restriction on quantifiers and DP structure has to be stated which limits possible applications of MERGE.

Relative clauses are basically anaphoric, as I will say in more detail below. But it seems that the quantifier-anaphora constraint (50) can be factored out of the analysis of relatives per se, as Hock 1989 argues. It turns out that non-relative sentences connected only in discourse obey the same constraint on construing an indefinite or weak quantifier with an antecedent.

- 51) (i) shimlaa-meeN meree **kaii sahayoogii** dakSiN bhaarat-kee thee  
 Simla-in my few associate southern India-gen were  
 (ii) **un-meeN-see eek-nee** kah-aa thaa [ki rah-nee-kee liyee kanaanor  
 3pl-in-from one-erg say-pf was that stay-inf-for Kananor  
 bahut acchii jagah hai  
 very good place is

‘(i) In Simla *a few of my associates(i)* were from South India. (ii) One **of them(i)** said that Kananor is a very good place to stay.’ (Rakesh 1961:10)

- 52) **vee laRkee** bahut caalaak haiN, **un-meeN-see/\*0 har eek** meeraa chaatr hai  
 those boys very clever are 3pl-in-from each one my student is  
 ‘Those boys are very clever, *each one of them* is my student.’

The problem of coindexing two DPs is not that one of them is relative, but rather that indefinite DPs have restrictions on an antecedent, and a relative antecedent is just one type of unsuitable antecedent, among others.

Another argument against the movement analysis addresses the question of whether the moved DP must be identical to what it is in its original site. Anaphoric coindexing does not require absolute identity. We see examples in both Hindi/Urdu (53) and Sanskrit (54) in which the relative phrase is not quite identical to the correlate.

### 53) Hindi/Urdu

- a. [**joo chaatr** wahaaN khaRaa hai] woo **laRkaa** meeraa doost hai.  
 rel student there standing is that boy my friend is  
 ‘The student who is standing there, that boy is my friend.’  
 b. \***[joo laRkaa** wahaaN khaRaa hai] woo **chaatr** meeraa doost hai.  
 rel boy there standing is that student my friend is  
 ‘The boy who is standing there, that student is my friend.’ McCawley 2004, 300.

### 54) Sanskrit

- [**yád** adhyá tva suryopabrávamahai]  
 rel.acc.neut today 2s.acc Surya.voc. speak-about-imper.1pl  
**tám** no deva ánu mamsirata **krátum**  
 that.acc.m 1pl.dat god.pl.nom ask-for.3pl goal.acc.m  
 ‘[That which we must speak to you about, O Surya,] the gods should ask us for that goal.’ RV 10, 37,5c, Hettrich 1988, 535.

In Hindi/Urdu, the common noun *laRkaa* ‘boy’ is a superset of *chaatr* ‘student’, and linear order of more specific-less specific is well-formed (53a). The reverse in (53b) is not<sup>25</sup>. In Sanskrit,

mismatches of the relative and correlate are common; in (54) there is a mismatch of gender between the neuter relative D and the masculine correlate. The mismatch poses a serious problem for analyses of correlatives as extracted from the main clause, leaving an overt trace in the form of the correlate pronoun, as McCawley 2004 notes.<sup>26</sup> Bhatt's analysis places the correlative within a DP which has an overt head, a pronoun or an NP. There would have to be a separate constraint which wouldn't be motivated by general conditions on discourse which requires the specific-general order in (53a).

The optional CP movement to TP proposed by Bhatt 2003 suffers from a lack of motivation. If movement is an instance of scrambling, it is not clear why the moved version adjoined to TP is the unmarked case. If it is Quantifier Raising, it is not clear why it is optional, or indeed what motivates it. In languages like Hungarian, quantifiers must be moved overtly to a functional projection below CP to express wide scope over another quantified phrase which c-commands the moved quantifier (Szabolcsi 1997). But in the case of Hindi/Urdu correlatives, there is no c-commanding quantifier in TP over which the correlative must have scope.<sup>27</sup> If correlative movement is some other kind of A' movement, then its motivation and optionality need to be further worked out.

In this section, I have discussed stipulations which would have to be made to derive the patterns of iterated relative clauses which I outlined above. These stipulations are drawbacks to Bhatt's 2003 movement analysis for Hindi/Urdu. I propose instead a base-generated analysis which directly adjoins the correlative to a clausal projection in both Sanskrit and Hindi/Urdu. Movement of a correlative from DP is not an option in Sanskrit, as relative clauses are not found sentence-internally, adjoined to NP/DP, and NP adjunction seems to appear relatively recently in Hindi/Urdu. My proposal gives a uniform analysis of both languages, with one specific difference correlated to difference of interpretation and grammaticality.

#### **4. Feature valuation and anaphora in a base-generation analysis**

In this section, I work out a feature-based analysis which makes use of an anaphoric link between the correlative clause and its correlate(s), and a semantic feature [PRED]. There is also a feature which motivates movement of the relative DP within the correlative clause. This analysis is based on a base-generated adjunction of the correlative.

##### **4.1. Features common to correlatives in Sanskrit and Hindi**

The first feature I propose is a semantic feature, [PRED]. It is a feature of C in correlative clauses which requires the correlative to be a restrictive (intersective, maximalizing) predicate on the correlate in the host clause (Grosu 2002). It is an instruction to the interpretative interface to translate the finite correlative clause as a predicate intersecting with the set defined by the common noun expression. It is in some ways similar to Rizzi's feature Rel, attached to C, which distinguishes relative clauses from questions and declarative complements (Rizzi 1990:67). Rizzi's feature is both a motivation for movement of a wh-phrase and an instruction for interpretation. Below I separate these functions.

[PRED] is equivalent to the ? feature on C in Scottish Gaelic and Irish (Adger and Ramchand 2005). It requires the translation of a CP or the chain of ?-marked Cs as a predicate (?).

expression) on the head NP, at the Conceptual-Intentional Interface. The ? feature is lexically encoded in Gaelic/Irish by complementizers used only for restrictive relative clauses. It is obligatorily associated with left-adjoined Hindi relatives (correlatives), but this association so far follows from no independent principle (cf. Grosu 2002).

Motivation for movement within the relative clause is due to the feature [uRel] on C, which is checked by the relative determiner in the correlative clause. It motivates movement of the relative (phrase) to the CP projection (mostly) obligatorily in Sanskrit, but optionally in Hindi. Within the correlative CP in Sanskrit and Hindi/Urdu, the relative D(P) moves to a left peripheral position in C [Force according to Rizzi 1997]. The feature [uF:Rel] on C is strong (Sanskrit) and either strong or weak (Hindi). It attracts D(P)s which have the relative series of determiners with [iF:Rel]. If the feature is weak, then [uF:Rel] is valued by Agree by the [iF:Rel] in the relative phrase in situ.

## 4.2. Anaphoric linking

In headed relatives the relative clause is syntactically adjoined to an NP (Safir 1986). A correlative clause and its correlate are anaphorically linked, and are not necessarily adjacent in narrow syntax. The correlate contains a determiner, which can be deictic or anaphoric (55):

55) Deictic/anaphoric determiners

a. Sanskrit:

- (i) *sás* 'that', *tá* 'that'
- (ii) *tátra* 'there' (etc.)

b. Hindi

- (i) *woo* 'that' (distal in contrast to deictic/proximal *yah* 'this')
- (ii) *wahaaN* 'there' (distal in contrast to deictic/proximal *yahaaN* 'here') (etc.)

An anaphoric relation is established between the correlative clause and its correlate. The deictic pronouns are anaphorically dependent, with an ID feature valued by an antecedent, in this case the correlative clause, which bears the index of the RelP in its specifier (by move or agree).

This relation identifies the correlate to be modified by the correlative clause.

## 4.3. Sequence of derivation of correlative structures

Relative determiners have the feature [iF:Rel]. C is specified [uF:Rel]. If [Rel] is present in Hindi, then the semantic feature [PRED] is possible. In Sanskrit, however, C has only the feature [uF:Rel]. We can represent this difference by saying that [PRED] is present in the lexicon of Hindi/Urdu, and so it can be part of the array in the numeration. In Sanskrit, it is not a lexical item, but only a default value inserted at the interpretative interface. In narrow syntax, relative D(P)s move to Spec/CP within the CP projection, checking [uF:Rel]. Correlative CP is merged with the host clause, according to what is possible in the two languages. Sanskrit has an independent prohibition on syntactic subordination, preventing asymmetric adjunction to TP. The derivation in both languages proceeds with two differences, (i) the absence of [PRED] in Sanskrit, and its obligatory presence on left-adjoined correlatives in Hindi, and (ii) the different

adjunction relation of correlative CP to its host.<sup>28</sup>

After merger of the correlative to its host, an anaphoric link is established between the correlative and the (local) correlate, valuing the [uF:ID] feature of the deictic element of the correlate, according to the index of the correlative specifier.<sup>29</sup> The operation Agree values the [ID] feature of the correlative. In Sanskrit, the dependence need not be local, allowing for longer distance relations in the stacked and iterative uses of correlatives; their counterparts in Hindi/Urdu are ungrammatical. It is not clear whether Agree is subject to the Phase Impenetrability Condition (Chomsky 2004). But we can speculate that Agree is not limited by conditions like Phase Impenetrability in Sanskrit, but it may be so limited in Hindi/Urdu. I return to this issue in 4.5 below.

#### 4.4. The interpretative interface

In Hindi, the feature [PRED] has been part of the derivation from the numeration onwards, and its presence requires a restrictive predicative interpretation of relative CP in conjunction with the correlate, blocking other interpretations. It is interesting to speculate that the translation of the correlative clause to a predicative lambda expression creates the need for an argument, found in locally in the host clause, a consequence of the asymmetric c-command condition (34). But this discussion cannot be conclusive without more independent evidence.

In Sanskrit, the absence of [PRED] means that the correlative is free to have an appositive interpretation or indeed others, such as conditional or interrogative (see Davison to appear). Information in the main clause defines the interpretation of the relative. For example, the appositive interpretation is possible if the correlate is a personal pronoun or proper name, the relative clause is translated as a sentence with a variable. The variable is covalued with the pronoun or proper name, as in a discourse sequence. See the examples (11), (30b.c) above for correlatives which have an appositive interpretation because the correlate is a propername or pronoun, and the relative is covalued with it (56).

56) Susan, who is coming today, will see you ==>  
 Susan will see you -- x is coming today    Covaluation: x = Susan

In other instances of correlatives, correlatives in Sanskrit have interrogative interpretation (21)-(22). This interpretation is determined by the matrix predicate if the matrix predicate selects C[Q]. In that case, the relative specifier is reanalyzed as interrogative in (56), because of the clash of the features on C and its specifier.

57)

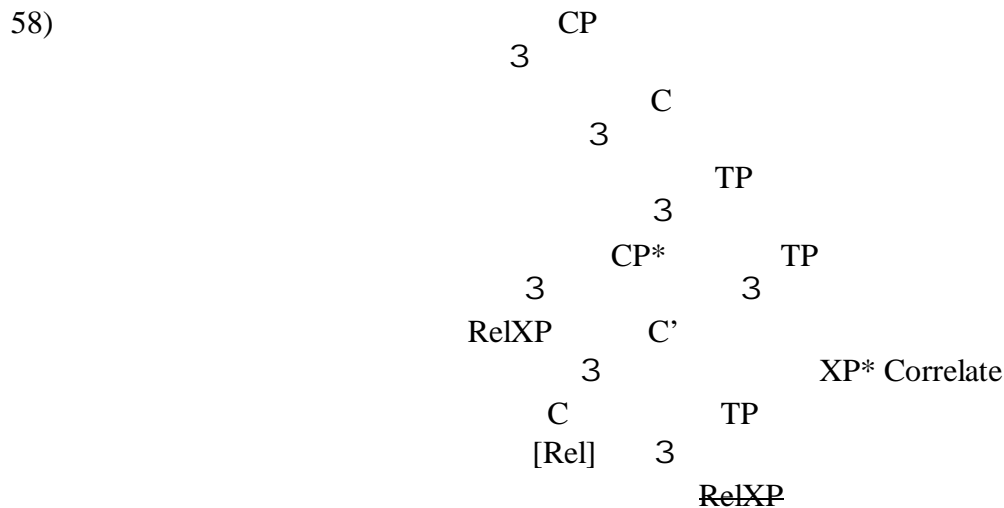
$$\begin{array}{c}
 \text{CP} \\
 \text{\scriptsize 3} \\
 \text{DP[Rel]==>[Q] C'} \\
 \text{\scriptsize 3} \\
 \text{C[Q]}
 \end{array}$$

If there is no specification in the correlative structure which requires an appositive or interrogative interpretation, then in Sanskrit the default feature [PRED] is inserted at the

interface, yielding the restrictive interpretation. Otherwise the correlative will lack a well-formed interpretation because of underspecification.

In sum, I have made use of several syntactic features in the derivation of correlative constructions. [uF:Rel] motivates movement or Agree linking a relative DP to C of the correlative clause. [ID] expresses the referential dependence of the deictic D in the correlate, and its valuation forms an anaphoric chain (Adger and Ramchand 2005), which identifies the correlate. To capture the restrictive use of correlatives, I adopt the privative feature [PRED] (Grosu 2002). It captures the restrictive predicative nature of the relative clause (Safir 1986, Adger and Ramchand 2005). There is empirical evidence for its existence in the correlation between relative clause forms and their interpretation, and in the Sanskrit-Hindi/Urdu difference.

The derived structure for Hindi/Urdu is represented in (58):



The chain linking CP\* and XP\* is an A' chain derived by base-generation and indexing, rather than by movement.

#### 4.5 Locality

Locality constraints apply to A' chains; the tail of the A' chain cannot be within certain syntactic configurations, such as a Complex NP. Movement-derived A' chains are clearly subject to this constraint, one of the arguments which Bhatt (2003) uses to support his movement analysis of Hindi correlatives. Here I discuss how a MERGE-derived A' chain could be subject to the CNPC.

First I want to note that the movement chain and the MERGE chain I propose are somewhat different. Bhatt (2003) moves the relative clause from an adjoined position within DP, leaving an unpronounced copy. I propose that there is a chain of category links (derived by AGREE), which is directly composed of the relative CP and its correlate, often realized as a pronominal (55).

Demonstratives as pronouns can have the familiar bound variable reading, if a quantified antecedent c-commands them, cf. (59a,b). The correlate or bound pronoun is within a complement clause subordinate to the matrix clause.

- 59) a. *har laRkaa* sooctaa hai [ki *woo* caalaak hai]  
 each boy think-impf is that 3s clever is  
 ‘Each boy thinks [that *he* is clever].’  
 b. [**joo** (**laRkaa**) wahaan rah-taa hai] maiN (yah) sooctii huuN [ki *woo* caalaak hai]  
 rel boy there stay-impf is I this think-impf am that 3s clever is  
 [Which boy lives there], I think (it) [that *he* is clever].’

Relative XPs have quantifier properties, but Bhatt (2003) shows that the relative construal with a correlate is not simply a matter of a quantifier and a pronoun which gets a variable interpretation: the bound variable interpretation as well as a correlate interpretation are possible in subordinate complement clauses (59a,b)-(60a), but not within another relative clause (60b).

- 60) a. *har laRkee-koo* [**woo kahaanii** [**joo** arundhati-nee *us-kee* baaree-meeN likhii hai]]  
 each boy-dat that story which Arundhati-erg 3s-gen about write-pf is  
 pasand hai  
 liked is.  
 ‘Each boy likes [the story [which Arundhati wrote about *him*]].’  
 b. \***[joo** (**laRkaa**(i)) wahaan rah-taa hai] mujh-koo [**woo kahaanii**(j) [**joo**(j) arundhatii-nee  
 rel boy there stay-impf is I-dat that story rel Arundhati-erg  
**us**(i)-**kee** baaree-meeN likhii]] pasand hai  
 3s-gen about write-pf liked is  
 ‘[Which boy lives there], I like [the story [which Arundhati wrote about (him)]]’  
 (after Bhatt 2003:300)

These examples show that a quantifier can bind a pronoun inside a complement clause and a complex NP, but a relative cannot have its correlate within a complex NP, though it can be coindexed with a correlate in a plain complement clause. Quantifiers seem to have a weaker condition than correlatives on binding a pronoun in a complex DP.

The features I have proposed for relative clauses construed with correlates are essential for defining the kind of relation which involves a relative CP and a correlate. The [PRED] feature in particular requires an argument, the correlate. Note that there are two [PRED] construal relations in (60b), one between the initial relative clause and *woo*, the other within a DP between *joo* and the head NP, which are in Safir’s (1986) predication binding relation. Taken literally, the syntactic correlate of the initial clause [*joo laRkaa* . . .] in (60b) is the complex DP *woo kahaanii(j) joo(j)* . . ., which has a different index and NP description, so it is not modified by the correlative. Rather the intended reading is that the correlate is *us(i)*. The predicate-argument relation is established on the basis of the coindexing described above, provided there is no intervener like the complex DP in (60b). The correlate may be within a complement clause, as in (59b). The complement is linked with a theta position, and as a clausal constituent it has no individual index or common noun description.

I explain the ungrammaticality of (60b) as a conflict of descriptions and indices at the interface, rather than a violation of a syntactic locality condition. Interestingly, a relative clause *can* be construed with a correlate inside another relative clause, as in (36) above, which should also be a violation of the Complex DP island constraint.<sup>30</sup>

There is a residue of cases involving crossover violations and bound variable binding. Some of the data are complex and subject to speaker variation, others not. The analysis of the conditions depends greatly on how logical form is conceived of in general, which is outside the scope of this paper. I will leave these interesting problems for future research. I will conclude that, aside from this set of examples, there is no convincing evidence which *requires* movement. I see no reason to prohibit movement, if it is motivated by a need to check formal features, and I have made use of an EPP feature on C which requires movement of relative phrases to the clause periphery in both Sanskrit and Hindi/Urdu.

## 6. Summary and conclusion

The goal of this paper was to make a case for the base adjunction of correlative clauses to a host clause, in both Sanskrit and Hindi/Urdu (as opposed to base adjunction in Sanskrit, and movement from DP in Hindi/Urdu, as in Bhatt 2003). In the preceding sections, I have offered evidence that the two languages are sharply different in the way they treat correlatives. First, there is evidence for a difference of adjunction: correlatives are symmetrically adjoined to CP, while Hindi/Urdu has asymmetric adjunction to TP. Sanskrit allows the clause initial string of functional heads on both correlative and host clauses, while Hindi/Urdu strictly limits wide scope questions to the host/matrix clause. In this respect, Hindi/Urdu follows Minimality, while Sanskrit appears not to. Sanskrit has no syntactic subordination, substituting the relative clause construction for it. Second, iterating correlatives is free in Sanskrit, allowing discourse dependence between correlatives and a distant correlate. Hindi/Urdu disallows multiple relatives on the same correlate, and allows iteration only if there is no ‘skipping’ of clauses with a correlate.

In spite of these differences, I analyze the syntactic derivations in exactly similar terms, with three specific differences: (i) the adjunction relation (ii) the existence of the restrictive feature [PRED] as a lexical choice in Hindi/Urdu, and only a default interpretative value in Sanskrit and (iii) a c-command condition (34) on correlatives in Hindi/Urdu, which might, if explored, further turn out to be a consequence of the need for an argument for the relative clause as predicate.

There is no motivation in Sanskrit for movement of correlatives from DP, as this analysis would require syntactic subordination of DP-internal relative clause. Sanskrit does not have syntactically coded subordination, nor adjunction of correlatives to DP/NP. As Bhatt 2003 points out, there is also no motivation for movement of correlatives with multiple relatives. There are several categories of evidence which would suggest movement, but the analysis requires a number of stipulations to work. These stipulations block iteration of correlatives, and limit the kind of quantifiers that can occur with the correlate. I derive these limitations from movement-independent factors. The distinction between good and bad iterations derives from the c-command condition on correlatives merged successively in a local relation, offering a more general account of iteration, including cases not discussed by Bhatt. The restrictions on what kind of quantifier can be in the correlate seem to follow from a general condition on discourse anaphora, matching the anaphoric coindexing component I proposed for correlatives; the anaphoric links between correlative and correlate identify the argument of the predication relation. While correlatives have properties of generalized quantifiers, there seem not to be sufficient motivation to raise them. Overt or covert raising derives a scope relation which would

not otherwise be possible to express.

Some important issues are left unresolved, which have to do with the binding theory and reconstruction. Nevertheless, making the case for base adjunction has revealed alternative explanations for the facts and focussed attention on some aspects of Indic syntax which have not been part of the discussion. The base adjunction analysis captures the continuity between the older language and a modern language, in which changes of syntactic structure seem to be relatively recent. The difference of syntactic structure are ones which can be expressed in Minimalist terms.

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1. The following abbreviations are used in glosses in the examples:

1 - 1st person; 2 - 2nd person; 3 - 3rd person; abl - ablative; acc - accusative; aor - aorist; caus - causative; cont - contingent; dat - dative; desid - desiderative; erg - ergative; f - feminine; fut - future; gen - genitive; imper - imperative; impf - imperfective; inf - infinitive; inst - instrumental; int - interrogative; loc - locative; m - masculine; middle - middle voice; nom - nominative; opt - optative; part - participle; pf - perfective; pl - plural; ptcl - particle; pres - present; prog - progressive; rel - relative; s - singular; voc - vocative.

2. See papers by Lipták and Rebuschi (to appear), Rebuschi (this volume) for an overview of the various relative clause structures in Basque. They have both clausal and right-headed DP-adjoined relatives, with sharply differing properties.

3. This sentence is true if the unique individual at the intersection of girls and standing people is a member of the set of tall people (Dayal 1996:156).

4. See Dayal 1996 for a discussion of the semantic difference of (7a) and (7c).

5. The translation into a logical language does not distinguish subordinate clauses syntactically, as differences of bracketing with & make no difference in truth value. Logical conjunction is also symmetric both syntactically and semantically.

6. The correlate is the subject of the verb in the correlate clause. It is expressed as morphological features on the verb.

7. Sanskrit freely allows both left and right adjunction of correlative clauses, with restrictive or appositive interpretation. Restrictives tend to precede, appositives to follow, but actually both orders are possible for the two interpretations. Discourse factors seem to be important in which clause is first. See Hettrich 1988 for discussion.

<sup>8</sup> An anonymous reviewer notes that the following sentence is grammatical:

(i) [jo tumheN kitaab caahiye] [vo mere-paas nahiiN hai]

Rel you.Dat book want that me-near neg is

'I don't have the book you want.'

9. Throughout this paper I will use referential indices to make clear which XPs are coreferent. This convention is for clarity of exposition.

10. This sentence seems to be unique in the corpus of Vedic Sanskrit, but it must be presumed to be grammatical. This assumption is at least partially supported by the existence of other anomalous correlatives, such as the examples cited in Delbrück (1888 365), with a 3ppl imperative apparently within a relative clause. While there is an alternative construal which places the imperative outside of the relative clause (see Hettrich 1988:140), it appears that genuine imperatives within correlatives occur in the Classical Sanskrit Mahabharata (H. Hock,

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p.c.).

11. Rizzi (1997) shows that Focus and Topic follow relatives, but precede interrogatives, and so we have to assume that Force distinguishes relatives from complement clauses, and Finite distinguishes questions from statements. Force is not to be taken as referring to illocutionary force.

12. This would be ForcePhrase in the structure shown in (25), which is abbreviated as CP in the schematic structure in (13).

13. This kind of stacking persists into Classical Sanskrit works such as *Shakuntala*; it is normal for ‘praise’ of notable figures (Hock 1992).

14. The asymmetry guarantees an unambiguous construal relation.

15. Interestingly, Jacobson (1983) shows that both question and relative DP can be modified by relative clauses in English:

(i) Who do you like who/that you invited?

(ii) Who who/that you invited do you like? (Jacobson 1983)

16. Sentences of this sort can be improved by using a specific intonation contour. The ‘middle’ clause can be given a lower intonation than the surrounding clauses, somehow making it less of an intervener between the first relative and its correlate in the last clause.

17. We may speculate, that in the ill-formed cases, the ‘low adjoined’ correlative in (30) forms an independent CP phase, which is spelled out separately from the phase containing the corresponding correlate before the relative CP modifier finds its argument, the correlate.

18. The inverse pattern is found in Sanskrit, in which multiple relative DPs are linked to separate peripheral correlate clauses (Hock 1989:109), which would involve multiple CP adjunctions:

(i) [I] sa(i) vai daivi vag [II] yaya(i) yad yad(j) eva vadati  
that ptcl divine speech rel-inst if rel ptcl say-pres-3s  
[III] tad tad(j) bhavati  
then that become-pres-3s

‘Divine speech is that such that if you speak something by means of it, then that comes about.’

BAU 1.3.27, Hock 1989L 109

(ii) [DP(i) . . . ] [ Rel(i) Rel(j) . . . ] [DP(j). . . ]

(iii)

			CP	
		3		
		CP		CP
	3		3	
CP		CP		CP

This kind of structure is clearly ruled out for Hindi/Urdu, assuming asymmetric category adjunction. TP-adjoined structures would violate Local c-command. The multiple relative clause would be predicated of one sister TP with just a single correlate, but it could not also simultaneously be predicated of the higher TP, with the other correlate.

19. I have not included a discussion of right-adjoined relatives, taking no position here about derivation in Hindi/Urdu by base generation or rightward movement. They are freely available in Sanskrit, apparently like left-adjoined correlatives in syntax and interpretation. For discussion of

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these right-adjoined relatives in Hindi/Urdu and how they differ from left-adjoined correlative, see Subbarao 1984 and Dayal 1996.

20. Interestingly, Marlow (1994) proposes a historical derivation of Hindi/Urdu NP-adjoined relatives from a left correlative clause by a process of leftward movement and copying of the N from a correlative, with reanalysis, rebracketing the N and the remnant correlative as a constituent. He uses the same ideas of leftward movement, copying and deletion as Mahajan, in the opposite direction.

21. See Srivastav 1991. This structure seems to have special discourse properties, best exemplified in contexts of emphasis or contrast, as in Bhatt 2003. If so, it is not likely to turn up in the literary texts which are the sole records of earlier Hindi. In this genre of text, relative clauses are either sentence-peripheral correlatives, or (beginning approximately in the 18th century) adjoined to the right of NP (see Davison (to appear)).

22. From a historical perspective, this suggests a change in phrase structure in early Hindi. The NP-CP structure is known from the 18th century on, presumably reflecting the influence of the Persian NP-CP relative structure with the complementizer *ke* instead of a member of the set of relative pronouns (Hajati 1978). In Hindi, this construction took on the function of expressing appositives, which otherwise were expressed by a relative clause to the right of the matrix. A further innovation would be left adjunction of CP to D, with only restrictive interpretation.

23. Bhatt (2003: 507) gives several examples of different combinations of two relatives which, with different sentence structure, would be well-formed by Condition (34) (his 32), or would violate it (his (34a,b) if both relative clauses were moved to the left. The sentence (33b) in Bhatt (2003: 508) is marked grammatical, but would seem to violate my Condition (34). I leave this question for future investigation.

24. To rule in sentences like (36), which Bhatt does not discuss, there would have to be an unusual combination of factors, distinct from the stacking of two relatives on the same DP. To derive (36) relatives adjoined to two DPs would each raise to TP. The first relative to move would have to contain the correlate of the second relative to move.

25. This order is similar to the name-epithet coindexing in discourse (i)-(ii):

i) John is leaving, and I won't miss the idiot.

ii) \*The idiot is leaving and I won't miss John.

26. Adger and Ramchand (2005) argue against a movement analysis of relatives and questions Celtic languages by showing that the head of the chain and the foot may differ in features of definiteness and case.

27. Reinhart 2006 proposes that covert Quantifier Raising is possible only when the intended scope reading is not otherwise possible; the use of choice functions accounts for many cases of scope relations without movement.

28. An alternative MERGE in Hindi/Urdu is to the right of NP, with or without [PRED]. These headed relatives have a restrictive or appositive interpretation. There is also the option of left MERGE to DP.

29. Alternatively this indexing could take place at the interpretative interface, for extra-sentential antecedents. In any case, the referential dependence of the deictic elements must be remedied by indexing.

30. All of this discussion is highly speculative, as much remains to be discovered about the

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relative constructions in Indic languages. The construal into a complement clause in (52b) may be possible because the complement clause is a phase with covert focus movement of the correlate into an edge position from which it is accessible to construal with [PRED].

Finite clauses are Phases, which are strictly limited for interrogative scope (ia). Non-finite clauses are (obligatorily) transparent to interrogative scope (iib). There are indications that relative operators have the same properties vis-a-vis finiteness.

- i) a. aap sooctee haiN [ki vee kyaa kar rahee haiN  
you think-impf are that 3pl what do prog are  
\* What are you thinking [that they are doing e]?  
'You are thinking about what they are doing.'
- b. aap [PRO **kyaa** kar-nee]-kii sooctee haiN?  
you what do-inf-gen think-impf are  
'What are you thinking [of PRO doing e]?  
\*'You are thinking about [what to do e].'