The Hindi correlative as an overtly pronounced index

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Abstract

One of the main defining features of the Hindi correlative construction is the necessity of a demonstrative correlate in the main clause. While previous research has done much to distinguish the correlative from other relativizing structures, such as the postnominal relative clause, it is still unclear what the relationship between the demonstrative and correlative clause is. In order to understand how the correlative clause enters the syntax, it is important to look at the internal structure and the semantic contribution of the demonstrative. In this paper, I will show that the correlative is an overtly pronounced index of the demonstrative, and therefore an argument of the demonstrative rather than adjoined to it. The semantic contribution of the demonstrative itself remain the same.

1 Introduction to the correlative construction

The correlative construction[1] is a specialized relativizing structure involving a correlative clause, headed by a relative pronoun, which relates to an indexical correlate in the main clause. Nearly all Modern Indo-Aryan languages have correlative constructions[2], but they also occur in other Indo-European languages and in a handful of non-Indo-European languages such as Bambara, Basque, Hungarian, and arguably Tibetan (Cable 2009). Several Dravidian languages have correlative constructions, as does Burushaski (an isolate spoken in northern India), arguably due to contact with Indo-Aryan languages. (Bhatt 2003; de Vries 2005; Lipták 2009)

Below is an example of a typical correlative construction in Hindi.

(1)	[jo	ləɽki	kʰeɽi	hɛ]	ʋo	ləmbi	hɛ
	which	girl.F.SG	standing.F.SG	be.PRS.3.SG	that	tall.F.SG	be.PRS.3.SG

`Which girl is standing, that/she is tall' (*from* Dayal 1996)

1.1 Terminology

The terms used for the different elements of the correlative construction are not always consistent, differing by theory, author, and type of treatment. In this paper I will refer to the relativizing clause as the *correlative* or correlative clause (*jo ləɽki kʰeɽi hɛ* 'which girl is standing' in 1), and the corresponding demonstrative as the *correlate* (*ʋo* 'that' in 1).

The correlative clause headed by a relativizing-*wh* or *relative pronoun* or a *relative phrase*.[3]

1.2 Features of the correlative construction

Dayal (in Srivastav 1991 and Dayal 1996) showed that correlative is an independent construction from the postnominal relative and has distinct syntactic features.

The correlative is generally described as having the following features (adapted from Lipták 2009).

[1]For this discussion, I will only be looking at the single headed nominal correlative, leaving aside non-nominal correlatives or specialized variations of correlatives, such as comparatives and conditional clauses, and multi-headed correlatives.

[2]Exceptions as noted by (Bhatt 2003, p. 488) include Southern Konkani, Saurashtri, and Sinhalese.

[3]For the sake of consistency, I will consistently gloss the relative pronoun *jo* as 'which' regardless of the English translation.

(2) Typical features of a correlative construction:

- Occur at the left periphery of the main clause.
- Headed by a relative pronoun or wh_{RC}.
- The relativized nominal may appear in both the relative clause and the correlative (*headedness*).
- There must be a correlate, either a demonstrative or a pronominal, in the main clause (the *demonstrative requirement*)
- Correlatives license multi-headed relative clauses.

Postnominal relative clauses differ from correlatives in that they are not fronted but follow the relativized nominal, they are not subject to the demonstrative requirement, they cannot be internally headed, they may be indefinite, and they do not license multi-headed relative clauses (Dayal 1996, Ch. 5-6).

2 Current analyses

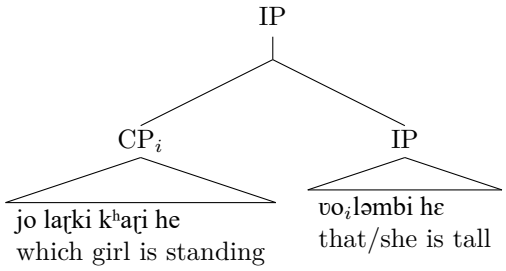
While earlier papers (Downing 1973; Keenan 1985; Andrews 1985) had noted that there were syntactic differences between correlative constructions and the postnominal relative clause, Dayal (in Srivastav 1991 and Dayal 1996) was instrumental in defining the syntactic features of the correlative that distinguish it from other relativization structures. Most recent analyses of correlatives follow Dayal in assuming that the correlative is an independent relativizing structure with syntactic and semantic features distinct from the postnominal relative (including, but not limited to, Grosu and Landman 1998; de Vries 2001, 2005; Bianchi 2002a,b; Bhatt 2003; Bhatt and Lipták 2009; Lipták 2009).

Bhatt (2003) argues that the correlative is a *local* construction. That is, the correlative clause is base generated at the demonstrative phrase itself and may be then fronted to a clause initial position.

2.1 The correlative is not a postnominal relative (Dayal 1996)

Having established that the correlative is a distinct construction from the postnominal relative clause, Dayal (1996) proposes the following syntactic structure for the correlative construction, in which the correlative CP is adjoined at IP and, importantly, has not undergone any movement.[4]

(3) Left-Adjoined Hindi Correlative:



[4]Dayal (1996) notes that there are cases where the correlative clause is pronounced at the demonstrative itself and allows for the possibility that the correlative may, optionally but less commonly, be adjoined at the demonstrative.

2.2 The correlative is base generated at the DemP (Bhatt 2003)

Bhatt (2003) revisits the question of where the correlative enters the syntax, and argues that the correlative clause is base generated within the same constituent as the demonstrative phrase (DemP). The correlative may then be raised to a fronted position at the left periphery.

It is possible for the correlative clause to be pronounced inside of the main clause, at the correlate phrase (as in example 4).

(4) ram [jo si.di sel pər hɛ] us si.di ko kʰaridega
Raam which CD sale on be.PRS.3.SG that.OBL CD ACC buy.FUT.3.M.SG

`Raam will buy which CD is on sale, that CD.' (*adapted from* Bhatt 2003)

Bhatt (2003) argues that the correlative not only can be, but must be, generated at the DemP. The first evidence for this is that correlative CPs are subject to island effects; a fronted correlative cannot be related to or modify a DemP inside of a relative clause island. This shows both that the correlative has moved, and that the correlative construction behaves differently than variable binding as Dayal (1996) had suggested.

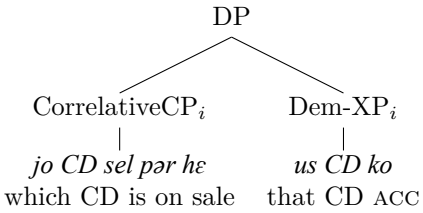
Secondly, correlatives are subject to the Coordinate Structure Constraint; where two correlativized demonstrative phrases are coordinate, neither correlative can be fronted. This is evidence that the correlative clause and demonstrative are part of the same constituent.

Further, reconstruction effects for both variable binding and quantifier binding show that the correlative is interpreted at the demonstrative phrase, ruling out readings which would have been possible had the correlative been adjoined at IP.

Bhatt concludes that the correlative CP and the DemP are base generated as part of the same constituent, with the correlative clause adjoined above the demonstrative phrase. The correlative clause may then undergo movement to a fronted position, but it is interpreted at its trace position at LF.

(5) a. [[CorrelCP] [$_{DemP}$ Dem NP]]

b.



2.3 Remaining questions

Previous research shows that the correlative construction is a distinct construction from the postnominal relative and is merged at the demonstrative phrase. But, it remains unclear what the relationship between the correlative and the correlate is, both syntactically and semantically.

In the next section, I propose that it is the semantics of the demonstrative itself which is the key to understanding how these structures are constructed.

3 The correlative as an index of the demonstrative

The key to analyzing the correlative construction lies in the underlying structure and semantic composition of the demonstrative itself. Following Nunberg (1993) and Elbourne (2008)'s analysis

of the internal structure of the demonstrative, I will show that the single headed, nominal correlative clause is an overt pronunciation of the index of the demonstrative.

3.1 The semantics and internal structure of the demonstrative

Nunberg (1993) shows that indexicals, or expressions which carry an index, are made up of four components: the classificatory component, the relational component, the deictic component which picks out an index, and the interpretation within the main clause.

The *classificatory component* includes the phi-features (gender, number, person) and animacy features. The *deictic component* identifies the index through gesturing and, in the case of the demonstrative, giving information about proximity. The *relational component* is the contextually defined relationship between the index and its interpretation. The relationship itself is not defined within the syntax but is dependent on the pragmatic accessibility of the relation.

Elbourne (2008, building on Nunberg 1993) formalizes the components of the demonstrative, proposing the following internal structure for the demonstrative.

(6) $[_{DemP}$ [[that i] R] NP]

The index i is a lexical item which is interpreted by means of *Variable Interpretation*.

(7) *Variable Interpretation* (Elbourne 2008)
For all natural numbers n and assignment functions g, if i_n is a variable with subscript n, then

$$[\![\text{ i(n) }]\!] \wedge \text{g=g(n)}$$

provided n is in the domain of g; $[\![\text{ i(n) }]\!] \wedge$ g is undefined otherwise.

R is the contextually defined relation between the index i and the interpretation of type e, where this individual has the property denoted by NP. The demonstrative morpheme *this* or *that* carries information about proximity and definiteness.

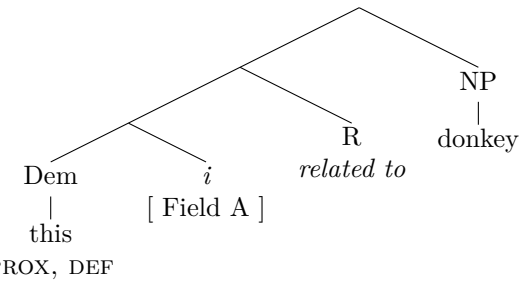
In order to see what each components contribute, consider an example in which the index and the interpretation are not the same.

(8) *A farmer keeps a donkey in a certain field. The farmer points at the field and says,*
That donkey [gesturing at Field A] is not healthy.

Importantly, the speaker can make the above statement whether or not the donkey is actually in the field. The meaning of the index, then, is not the donkey itself.. Instead, *this donkey* picks out 'field' as the index, where the field represents the donkey who lives in it.

The full demonstrative phrase, *this donkey*, has the following structure, [5] along with the semantic contribution of each component (Elbourne 2008).

(9)



[5] A simple mirroring of the demonstrative and the index gives us the proper Hindi word order for the demonstrative while retaining the appropriate hierarchal relations, reflects that Hindi is right-headed, and avoids a violation of the Final Over Final Constraint (FOFC).

$[\![$ that $]\!]^{w,h,a,t} = \lambda x_{<e>}.\lambda f_{<e,sest>}.\lambda g_{<se,st>}.\lambda s.\sigma z$ (f(x)(λs'.z)(s)=1 & g(λs'.z)(s)=1 & distal(x,w,a,t))
(Abbr.: *worlds (w), actor/speaker (a), speech time (t), variable assignment function (h), contextually salient situation (s).*)
$[\![$ R $]\!] = \lambda y.\lambda x_{<s,e>}.\lambda s.x(s) = y$
$[\![$ donkey $]\!] = \lambda u_{se}.\lambda s.u(s)$ is a donkey in s

The demonstrative *that donkey* in (8) is then interpreted as below.

(10) $[\![$ that donkey $]\!] = \lambda s.\iota z.(z{=}\iota x.x$ is a field $\wedge$ z is a donkey in s $\wedge$ distal(field,w,a,t))

3.2 The correlative as an overt index

The necessity of a corresponding correlate in the main clause is a defining feature of the correlate construction cross-linguistically. What is it about the indexicality of the correlate which allows the correlative CP to enter the syntax?

I propose that the correlative clause enters the syntax as an overt pronunciation of the index of the demonstrative.

Consider the following example, reflecting Bhatt's proposed constituent structure.

(11)

rohɪt	[$_{Cor}$ [$_{RelP}$	jo	kitab]	sɛra	ne	lɪkʰi		hɛ]
Rohit.M.SG		which	book.F.SG	Sera.F.SG	ERG	write.PFV.F.SG		PRS.3.SG
[$_{DemP}$ ʊo	kɪtab]	pəɾʰ	rəha		hɛ			
that.S	book.F.SG	read	PROG.M.SG		PRS.3.SG			

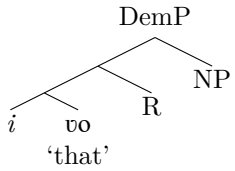
`Rohit [[which book Sera has written] [that book]] is reading.' (*adapted from* Bhatt 2003)

The correlative construction may roughly be described as two sentences or clauses (Keenan 1985) where an argument defined by the correlative CP appears to also be participating in the event defined by the main clause. For example, in example (11) there is a book which Sera has written and this same book also participates in the event of Rohit reading.

This is exactly what a demonstrative does. It picks out a referent and allows that referent to participate in the event defined by the main clause through a relation R.

(12) a. [[[*i* that] R] NP]

b.



We can now update the constituent structure of the correlative-correlate constituent to reflect that the correlative is an overt pronunciation of the index of the demonstrative.

(13)

[$_{DemP}$ [[[$_{Cor}$	[$_{RelP}$	jo	kitab]	sɛra	ne	lɪkʰi	hɛ]	ʊo]	*R*]	[$_{NP}$	kɪtab]]			[H]
	which	book	Sera	ERG	wrote	PRS	that				book			

`... [[[[which book Sera has written] that] R] book] ...'

We know that the correlative-correlate in example (13) should compose to mean something like: *There is a book which Sera wrote, and Raam is reading that book.*

For now, assume that the correlative contributes the following semantics. Note that I am using a simplified notation for tense and aspect, as it is not relevant to the current discussion.

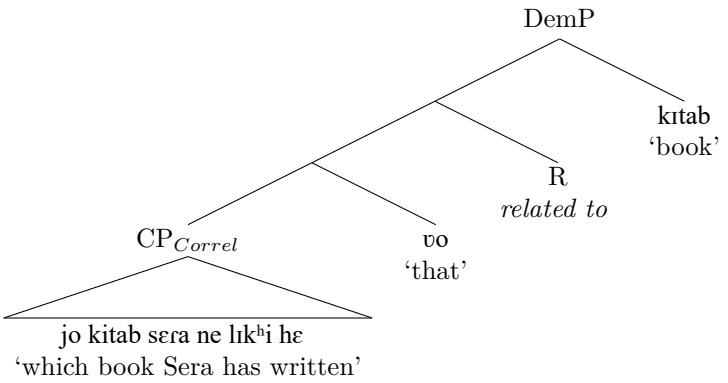
(14) Semantic composition of the correlative clause (preliminary)
⟦ which book Sera wrote ⟧ = ⟦ BOOK ⟧ =
ιx.∃e.x is a book$_{RC}$ in e ∧ write(e) ∧ agt(e, Sera) ∧ pt(e,x) ∧ PERF(e) ∧ PRS(e)

The unique x such that x is a book and there is an event of Sera writing x.

Because there are two NP's *kɪtab* 'book', I have included a subscript to show which clause the NP is included within. I will call the semantic contribution of the correlative ⟦ BOOK ⟧ so that the following calculations are more transparent.

Turning to the demonstrative phrase, the semantic composition of the demonstrative and the components within it are the same as the demonstrative in a normal (i.e., non-relativizing) context, repeated below.

(15)



Each component has the same semantic contribution as shown in (9). Here, R is an identity relation between the book Sera has written and some individual z where z also has the property of being a book.

Recall that Bhatt (2003) analyzes the correlative-demonstrative as having the following constituent structure.

(16) [[Cor(rel)] [DemP]]

Like Bhatt's analysis, the correlative, the demonstrative, and the NP are all part of a single constituent. Under this analysis, though, the relationship between the correlative CP and the demonstrative correlate follows directly from the internal structure of the demonstrative itself.

The correlative-correlate constituent, where the correlative CP is an argument of the DemP, has the following semantic contribution.

(17) ⟦ which book Sera wrote, that R book ⟧ =
ι z.z is book$_{MC}$ in e ∧ z = ιx.∃e.x is a book$_{RC}$ in e ∧ write(e) ∧ agt(e, Sera) ∧ pt(e,x) ∧ PERF(e) ∧ PRS(e) ∧ distal(x, a, t)

The unique z such such that z is a book$_{MC}$, and there is a unique, presupposed x such that z equals x, and x is a book$_{RC}$, and there is an event e such that e is an event of Sera writing x and x is distal.

3.3 Conclusion and Implications

It is not a coincidence that the correlate must be either a demonstrative, pronoun, or other indexical. In fact, it is their very indexicality which allows the correlative clause to enter the syntax. The correlative clause itself is an overtly pronounced index of the demonstrative phrase, and an argument of the demonstrative itself.

This analysis predicts various features of the correlative construction, such as independent case marking and the ability of each clause to be independently headed.

In many papers, it is assumed that the head_{RC} and the head_{MC} must be the same, but this is not actually the case.[6] (This was also noted by McCawley 2004, and Dayal 1996 includes a few examples as well.)

(18) [jɪs adʰiʸapək ne us- ki klas ko ʧaklɛt di]
which.S.OBL teacher.F.SG ERG that.OBL of.F.SG class.M.SG.OBL ACC candy.F give.PFV.F
ʊo ɔrət səb- se atʃʰ:i adʰiʸapək hɛ
that woman all- from good.F.SG teacher.F.SG be.PRS.3.SG

'Which teacher gave her class candy, that woman is the best teacher.'

This follows from the fact that the two NPs – for example, *adʰiʸapək* 'teacher' in the correlative clause and *ɔrət* 'woman' in the demonstrative phrase of the main clause – are generated independently and each make their own semantic contribution.

Another characteristic of correlatives is that each of the NPs can have independent case marking. This is difficult to account for in terms of copying or spell out but follows easily from an indexical analysis of the correlative.

(19) [jɪs- se mẽ battʃɪt kar rəhi tʰi]
which.OBL with I.F.SG conversation.M.SG do PROG.F.SG PST.F.SG
us mɪstri ne mera baik marəmət kiya
that.OBL mechanic ERG my.M.SG motorcycle.M.SG repair do.PFV.M.SG

`Who I was talking with, that mechanic fixed my motorcycle.'

In order to understand how the correlative clause is able to enter the syntax, it is necessary to look not only at the syntactic features of the construction but also to the semantic composition of the demonstrative itself. The demonstrative and other indexicals are made up of separate components which each have their own semantic contribution (Nunberg 1993). These components translate to a syntactic structure which includes the index, not only as a semantic notion but which is in fact a lexical item within the syntactic structure (Elbourne 2008).

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[6] This example comes from my own fieldwork in Hindi-Urdu as spoken in Nizamuddin, Delhi, India.

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