COMPARISON CONSTRUCTIONS IN HINDI

Chapter 1. Introduction

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1.1 Background

This work sets out to investigate comparison constructions in Hindi. That means that for all the major comparison constructions in Hindi a semantical interpretation is proposed.

This work was done as a part of B17, SFB 441 at the University of Tübingen[1]. The goal of B17 was to examine comparison constructions in 14 languages (namely Bulgarian, Guaraní, Hindi, Hungarian, Mandarin Chinese, Mooreé, Motu, Romanian, Russian, Samoan, Spanish, Thai, Turkish and Yourùbá) in order to find out at which point those languages differ. Now, there is a set of comparable data which was elicited uniformly: translation into the target language with the help of a native speaker followed by a questionnaire with which naive informants were confronted.

This questionnaire was built in a homogenous fashion. For all the constructions, a scenario was put in front of the sentences in question in order to test whether the relevant reading is available in the language or not:

Suppose that Sangītā is 1,72m(5'6") and Ramesha is 1,7m(5'4"). Can you say the following sentence?

1) Sangītā Rameshaa se lambī hai.
   Sangītā Ramesha SE tall.fem is
   Sangītā is taller than Ramesha
   Ok [ok/5(5)]

Suppose that Sangītā has to be in India on Dec. 1st, but she arrived there already in November, which is allowed. Can you say the following sentences?

2) Sangītā ko [jaba pahuchnā thā wo]
   Sangītā Acc [when reach was she]
   usa se pahale pahucha gayī.

[1] The paper which descriebes the achievements for all 14 languages is (Beck, et al., accepted)

that SE early reach went

Sangītā arrived earlier than she had to.

Ok[ok/2(2)]

The informants had to give judgements to the sentence according to a common standard for all languages, as is indicated in 1) & 2):

Judgement	Grammaticality	Felicity in a given context
Ok	**grammatical (1)** "I can say this sentence"	**felicitous (1)** "I can say this sentence in the given context"
?	**slightly marked (2)** "Maybe, I can say this sentence"	**slightly odd (2)** "Maybe, I can say this sentence in the given context"
??	**very marked (3)** "I would rather not use this sentence"	**odd (3)** "I would rather not use this sentence in this context"
*	**ungrammatical (4)** "I cannot say this sentence"	**inappropriate (4)** "I cannot say this sentence in the given context"

The goal of the questionnaire was to find out whether Hindi has free or bound morphemes operating on degree arguments, whether clausal, adverbial or attribute comparatives are avaiable and whether Hindi has a comparable degree ontology to English.

The findings and suggested semantical interpretation do not have any explanatory power as to why Hindi (or the other languages) have or doesn't use a certain construction or reading.

But nonetheless, B17 proposed three parameters in order to try to predict whether a certain structure is possible in a language or not. The DSP and the DAP are both semantic parameters. The first concerns the syntax/semantics interface and the latter systematic lexical variation. The DEGPP is a syntactic parameter which gives hint as to whether there are certain syntactic constraints in a given language or not. It is important to

note that "[i]t has been very imiprtant for our theoretical reasoning that empirical properties can be seen as coming in clusters, and that there are dependencies between tham in that some options appear to be prerequesites for others."[2]

The findings of B17, and of this paper, are that "the grammar of comparison is subject to substantial crosslinguistical variation."[3] Hindi behaves similar to English or German concerning the grammar of comparison, with one big exception which has nothing to do with comparisons, namely that clausal comparatives are not available in Hindi.

1.2 Preview

This work is divided in three major parts. First, an analysis for English comparison constructions is presented, then, analoguously, an analysis for Hindi comparison constructions is presented and finally there is a suggestion and discussion for degree correlatives in Hindi.

In chapter 2, the starting point, namely the analysis for English comparison constructions is presented. The starting point of this presentation is Beck(to appear). In order to prepare for the discussion whether to take a 2 or 3-place comparative operator, Bhatt & Takahashi (2007) reasoning for taking a 2-place comparative operator – what they call REDUCTION ANALYSIS - is presented as well. Other than that, an analysis for clausal and phrasal comparatives, the equative and positve, the superlative, measure phrases and differentials and finally degree questions is presented.

In chapter 3, a suggestion is made for the interpretation of Hindi comparison constructions. Picking up the discussion of chapter 3, (Bhatt & Takahashi, Direct Comparisons: Resurrecting the Direct Analysis of Phrasal Comparatives, 2007) is presented to understand their reasoning for employing a 3-place operator for Hindi comparison constructions – what they call DIRECT ANALYSIS. Using a similar structure as in chapter 2, similar phenomena in Hindi are presented with a suggestion for their

[2] (Beck, et al., accepted, p. 32)
[3] (Beck, et al., accepted, p. 31)

semantical interpretation which is not always possible. Here, clausal comparatives are meant, because Hindi uses a correlative structure as an alternative. This is such an outstanding case, that this is considered in a chapter of its own.

In chapter 4, finally, correlatives are investigated, specifically degree correlatives. In Hindi correlatives are also used to realize conditionals, *when*-clauses and *until*-clauses (c.f. Bhatt (2006)). And of course, an analysis for degree correlatives is presented.

The focus of this work was put on how Hindi comparison constructions are different from English comparison constructions. As a helpful tool, the parameters employed by B17 were consulted to see the context in which Hindi gets analyzed.

Chapter 2. Syntax and Semantics of comparison in English

In this chapter a short introduction into the syntax and semantics of English comparison constructions will be given. The theoretical background is mainly taken from Beck (to appear), which provides the main aspects of the theory. When discussing the question whether there are phrasal comparative constructions in English possible or not I will present Bhatt & Takahashi's (2007) suggestion and refer to Heim's paper (1985) which is also Beck's starting point of discussion.

2.1 Starting point

If you think about comparatives, the first thing to do is to take a look at the meaning of the adjective. Beck follows von Stechow (1984): gradable adjectives are relations between individuals and sets of degrees.
A new type for degrees is introduced, <d>. D_d, the denotation domain for d consists of mutually disjoint and ordered sets, e.g[4].:

3) SD:= the set of all spatial distances
   $>_{SD}$:= {<x,y> ∈ SD x SD: x is a greater spatial distance than y}
4) TD:= the set of all temporal distances
   $>_{TD}$:={<x,y> ∈ TD x TD: x is a greater temporal distance than y}
5) Call each such pair (X, $>_x$) a scale
   Properties of orders: $>_X$ is total on X, asymmetric, transitive, irreflexive.

It is important to keep in mind that those degrees necessarily have to be on the same scale in order to be interpreted.
Gradable adjectives (of type <d,<e,t>>) like *tall* receive the following lexical entry[5]:

6) ⟦tall⟧ =λd: d∈ D_d.λx:x∈ D_e.Height(x)≥d

[4] (Stechow, Comparing Semantic Theories of Comparison, 1984)
[5] (Stechow, Comparing Semantic Theories of Comparison, 1984)

To be entirely precise, including the restriction to spatial distances, the entry would look like this:

7) ⟦tall⟧ = λd: d∈ D_d & d is a vertical distance in SD. λx: x ∈ D_e. Height (x) ≥d

The shorthand notation for above adjectives looks like this (6) and 8) are variants of the lexical entry for *tall*):

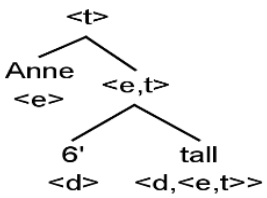
8) ⟦tall⟧ =λd. λx. x is d-tall

As we can see, adjectives are analyzed as denoting a relation between a degree and an individual.
Having made clear those premises, it is possible to calculate the truth-conditions of sentences such as:

9) a. Anne is 6' tall.

If we assume the following LF we get the desired result, namely that Anne's height equals or exceeds 6'.

b.



c. LF: Anne is [6'[tall]]

d. ⟦tall⟧ (6')(A)= 1 iff Height (A)≥6'

For sentences of the following kind:

10) Anne is taller than 6'

where there is a comparison with a degree, we need to assume more in order to be able to calculate this sentence properly:
the maximality operator and a meaning for the comparative morpheme (in 11) and 12)):

11) max(P)= the d: P(d)=1 and ∀ d'[P(d')=1→d'≤d]

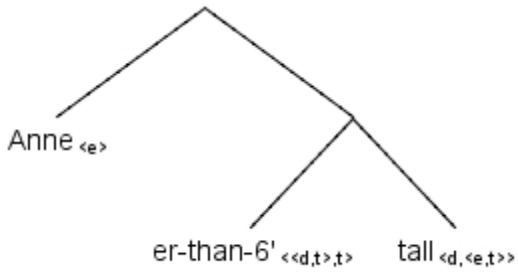
12) ⟦er⟧ =λd.λP.max(P)>d

type <d,<<d,t>,t>>

The maximality operator or MAX is needed to specify that only the maximal degree in question (in this case of tallness) is relevant. MAX ensures that only one degree, namely the highest, is picked.
Applied to 10), the following structure is adapted :

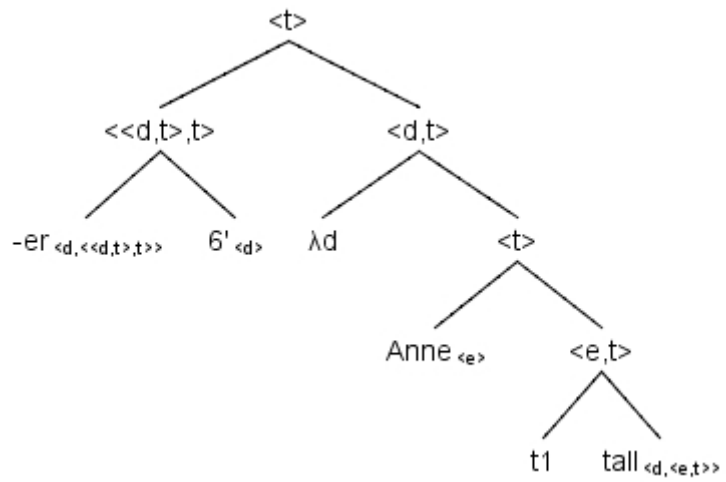
13) a. Anne is[-er than 6']tall]

b.



As indicated in 13)b, the structure is not interpretable because of the type mismatch; the adjective is not compatible with the degree expression. To get an interpretable structure the comparative morpheme is raised to get an LF like this:

14)



With this LF, it is possible to calculate the truth conditions:

15)

⟦[er than 6'] [λ1 [Anne is [t_1 tall]]]⟧ $^{g[d/1]}$	= 1iff
[⟦er⟧] (⟦6'⟧) (⟦[λ1 [Anne is [t_1 tall]]]⟧ $^{g[d/1]}$)	= 1iff
[⟦er⟧] (⟦6'⟧) ([⟦tall⟧](⟦t_1⟧ $^{g[d/1]}$)(⟦Anne⟧)	= 1iff
[⟦er⟧] (⟦6'⟧) ([λd.λx.Height(x)≥d](g[d/1](1))(A)) = 1iff	
[⟦er⟧] (⟦6'⟧) (λd.Height(A)≥d)	= 1iff
[λd.λP. max(P)>d] (6') (λd.Height(A)≥d)	= 1iff
[λP. max(P)>6'] (λd.Height(A)≥d)	= 1iff
max(Height(A)≥6')	= 1iff
Anne's height exceeds 6'	

2.2 Subcomparatives and other clausal comparatives

Subcomparatives are those clausal comparatives, where two different adjectives which necessarily operate on the same scale are employed. Remember the lexical entry for gradable adjectives with the explicit mentioning of the dimension. Consequently those two adjectives have to operate on the same scale in order to be compared :

16) Nataliya is taller than the sofa is long.
'Nataliya's height exceeds the length of the sofa'

Note that subcomparatives are only acceptable if both adjectives operate on the same scale. Sentences like

17) Anne is faster than her husband is tall.

are not acceptable.

16) means that the height of Nataliya exceeds the length of the sofa, or more formally:

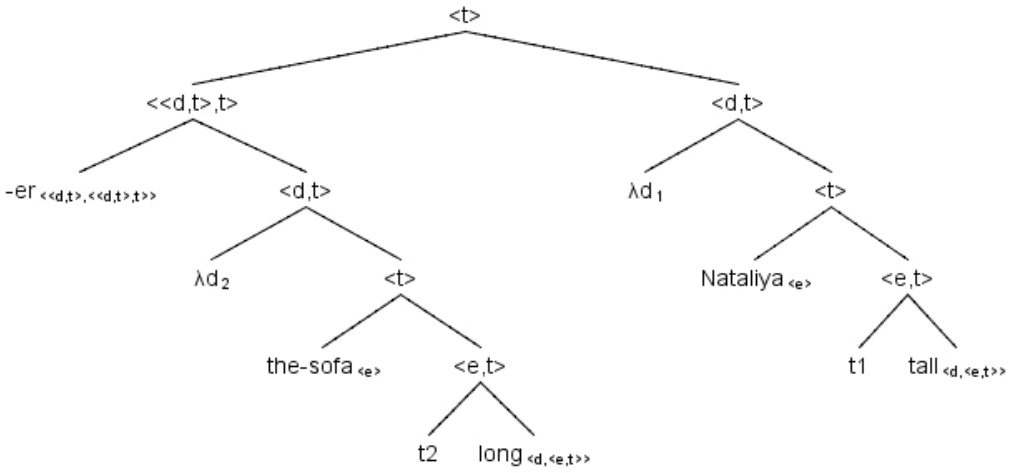
18) max(λd. Nataliya is d-tall) > max(λd'. the sofa is d-long)

The maximal degree of tallness in the main clause is compared to the maximal degree of length in the subordinate clause; i.e.the maxima of the two sets of degrees are compared. Thus, the lexical entry of the comparative morpheme for clausal comparatives is the following:

19) $[\![er_{clausal}]\!] = \lambda D_1.\lambda D_2.max(D_2) > max(D_1)$
and is of type <<d,t>,<<d,t>,t>>

The LF, then, looks like this:

20) a



b [-er[2[the sofa [t_2-long]]] [1[Nataliya[t_1-tall]]]]

⟦-er 2 the sofa t_2-long 1 Nataliya t_1-tall⟧ =1 iff

⟦-er⟧ (⟦2 the sofa t_2-long⟧) (⟦1 Nataliya t_1-tall⟧) =1 iff

⟦-er⟧ (λd. ⟦the sofa t_2-long⟧ $^{g[d/2]}$)

(λd. ⟦Nataliya t_1-tall⟧ $^{g[d/1]}$) =1 iff

⟦-er⟧ (λd.[⟦long⟧ (⟦t_2⟧ $^{g[d/2]}$)(⟦the sofa⟧))

(λd.[⟦tall⟧ (⟦t_1⟧ $^{g[d/1]}$)(⟦Nataliya⟧)) =1 iff

⟦-er⟧ (λd.[[λd'.λx.x is d'-long](d)(the sofa)])

(λd.[[λd''.λx.x is d''-tall](d)(N) =1 iff

⟦-er⟧ (λd.the sofa is d-long) (λd. Nataliya is d-tall) =1 iff

[λD_1.λD_2. max(D_2) > max(D_1)] (λd.the sofa is d-long)

(λd. Nataliya is d-tall) =1 iff

max(λd.Nataliya is d-tall) > max(λd.the sofa is d-long)

'the maximal degree to which Nataliya is tall > the maximal degree to which the sofa is long.'

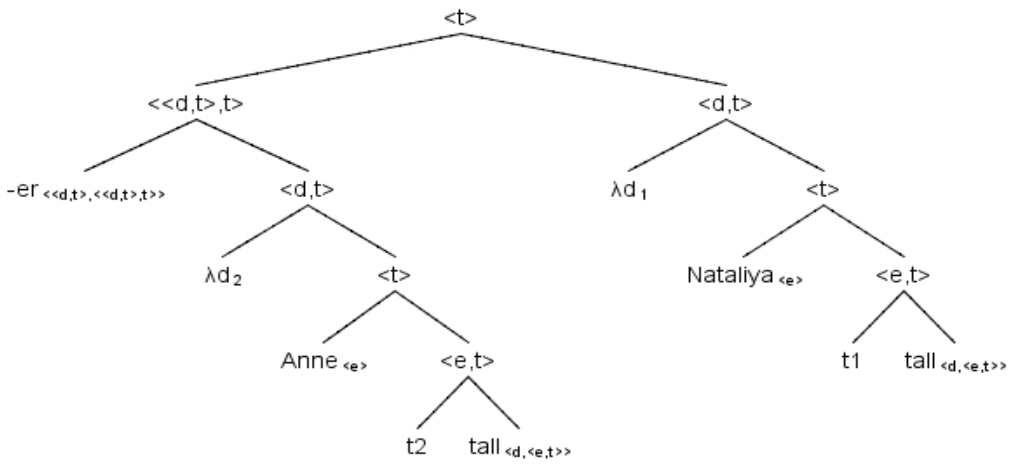
Having seen how subcomparatives work, clausal comparatives are easily dealt with. It is assumed that parts of the degree descriptions have been elided:

21) a.Nataliya is taller than Anne is.

Analogous to the one of the subcomparative, except for the deletion, the LF of 21)a looks like this:

b. [[-er[than[2 [Anne is [~~AP~~ t_2 tall]]]] [1 [Nataliya is [AP t_1 tall]]]]

c.



It is possible to interpret this sentence with similar devices as before.

22) ⟦-er⟧ (λd. height (N) ≥ d) (λd. height (A) ≥ d) =1 iff
max (λd. height (N) ≥ d) > max (λd. height (A) ≥ d)

Height (Nataliya) > Height (Anne)

2.3 Phrasal comparatives

Going back to Heim(1985), there has been discussion as to whether there are proper phrasal comparatives in English or if they have to be interpreted as clausal comparatives. She does not come to a final conclusion, because neither approach is able to deal completely with phrasal comparatives. Bhatt & Takahashi (2007) suggest in their paper that phrasal comparatives in English indeed have to be interpreted as reduced clausal comparatives, in which they follow Lechner(2001).

In this chapter, there will be a short introduction to how Heim (1985) interprets phrasal comparatives directly. Then, in contrast to that,

Lechner's (2001) proposal is presented and a short summary of why Bhatt & Takahashi take this to be a better analysis will be given after each subsection.

2.3.1 Phrasal comparatives following Heim (1985)

Consider the following sentence:

23)a Nataliya is taller than Anne.

b max(λd. Nataliya is d-tall) > max(λd'. Anne is d'-tall)

In order to derive that meaning, the lexical entry for the comparative morpheme has to be like this:

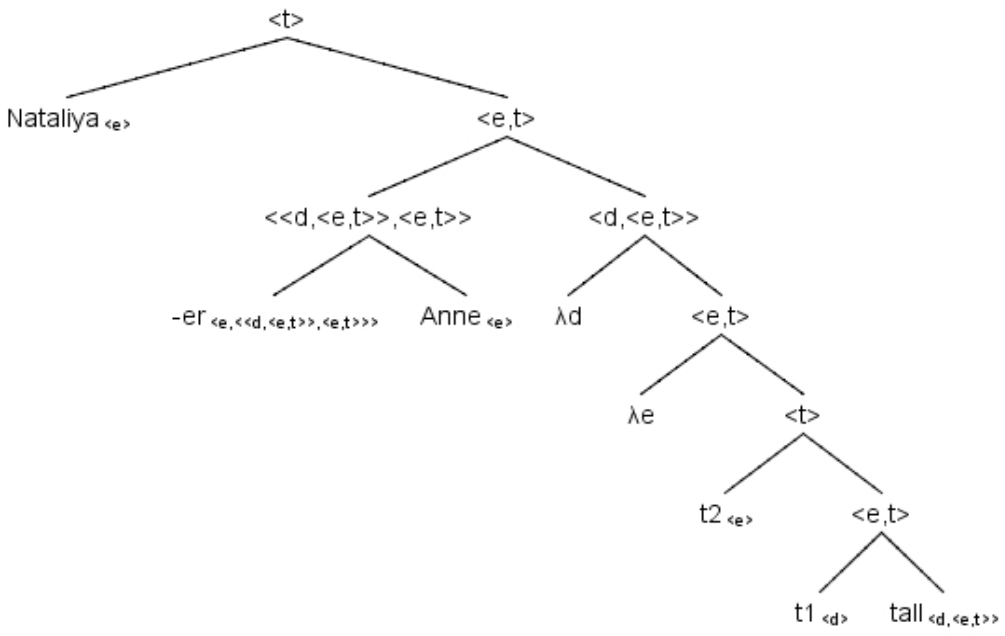
24) $[\![er_{phrasal}]\!]$ = λy.λR.λx.max(λd.R(d)(x)) > max(λd'.R(d')(y))

type <e,<<d,<e,t>>,<e,t>>>

Assuming the following LF, the calculation of the truth conditions comes out like this:

25)a.Nataliya[[-$er_{phrasal}$ than Anne] [1[2[t_2 is t_1 tall]]]]

b.



26)

$[\![\text{Nataliya}[[\text{-er}_{\text{phrasal}}\ \text{than Anne}]\ [1[2[t_2\ \text{is}\ t_1\ \text{tall}]]]]]\!]$ = 1 iff

$[\![\text{-er}_{\text{phrasal}}]\!]$ (A) ($\lambda d.\lambda x.$ $[\![t_2\ \text{is}\ t_1\ \text{tall}]\!]^{g[x/2],\, g[d/1]}$) (N) = 1 iff

$[\![\text{-er}_{\text{phrasal}}]\!]$ (A) ($\lambda d.\lambda x.$ x is d-tall) (N) = 1 iff

max(λd. N is d-tall) > max (λd'. A is d'-tall)

Height(Nataliya) > Height (Anne)

Bhatt & Takahashi call this the Direct Analysis (DA).
Following Lechner's argumentation, they rule the DA out, because it is not possible to capture the binding properties of phrasal comparatives. In the following paragraphs, their reasoning will be presented. First, the tool with which they prove their point will be presented in order to apply it to the sentences following it.

27)

The phrasal comparative binding generalization:
The remnant is c-commanded by everything that c-commands the associate.

Take into account, that in this case the C-COMMAND CONDITION ON BINDING is valid as usal :

28) C-COMMAND CONDITION ON BINDING[6]

A bound constituent must be c-commanded by an appropriate antecedent.

Consider the following sentences:

29)a *More people introduced him$_i$ to Sally than to Peter$_i$'s sister.

Here, the pronoun *him$_i$* c-commands the associate. The sentence is out, because the pronoun is not able to corefer with a name within the

[6] Radford (third printing 2007, p. 75)

remnant, the c-condition is not fulfilled. This suggests that the name also c-commands the remnant.

b More people introduced Peter$_i$ to Sally than to his$_i$ sister.

c ?More people introduced Sally to him$_i$ than Peter$_i$'s sister.
Here, the associate is not c-commanded by the pronoun which can corefer within the remnant. So, the pronoun does not c-command the remnant.

d More people introduced him$_i$ to Sally than to himself[7]$_i$

The ungrammaticality of 25)a cannot be explained by claiming that a direct object and an indirect object always c-command a than-phrase. Consider:

30)

a Mary gave him$_i$ more presents than John$_i$'s mother.
b Mary gave more presents to him$_i$ than John$_i$'s mother.

In both 29)a&b, the pronoun does not c-command the associate and following the phrasal comparative binding generalization it can corefer with a name in the remnant.
The relevance of this data is constituted by the fact that this behaviour cannot be captured under the direct analysis.
Under the DA, the LF of 29)a & c look like this:

31)

a [[to Sally] [[-er [than to Peter$_i$'s sister]] [λd.λx. [d-many people introduced him$_i$ to x]]]]
b. [[Sally] [[-er [than Peter's sister]] [λd.λx.[d-many people introduced x to him$_i$]]]]

[7] Note that Bhatt & Takahashi slightly change Lechner's example, because they claim that those examples do not make the intended point.

In both representations, the pronoun does not c-command the remnantweil: the DA does not capture an important feature of English phrasal comparatives. The generalilzation in 27) does not get predicted; Bhatt & Takahshi therefore come to the conclusion that the DA is not at work in English. Instead, they work with the Reduction Analysis (RA).

2.3.2The Reduction Analysis for English phrasal comparatives.

What Bhatt & Takahashi call RA was earlier in this work called elliptical clausal comparative. The LF- representations for 29)a. & c. are the following:

32)

a*More people introduced him$_i$ to Sally [than λd. d-many people introduced him to Peter$_i$'s sister]

b. ?More people introduced Sally to him$_i$ [than λd. d-many people introduced Peter$_i$'s sister to him$_i$]

Under this analysis, the generalization is captured quite convincingly.
Here, it is to be seen at LF that the condition C is not fulfilled and therefore the sentence is not good. *Peter* cannot corefer with *him$_i$,* because *Peter* is contained in the sister of the pronoun. For this reason, Bhatt und Takahashi come to the conclusion that the RA is the proper one for English phrasal comparatives.
Here's a short illustration how such an analysis works[8]:

33)Nataliya is taller than Anne

Those sentences get analyzed analogous to clausal comparatives using the same lexical entry for –er: er$_{clausal}$. Remember:

34) $[\![er_{clausal}]\!] = \lambda D_1.\lambda D_2.max(D_2) > max(D_1)$

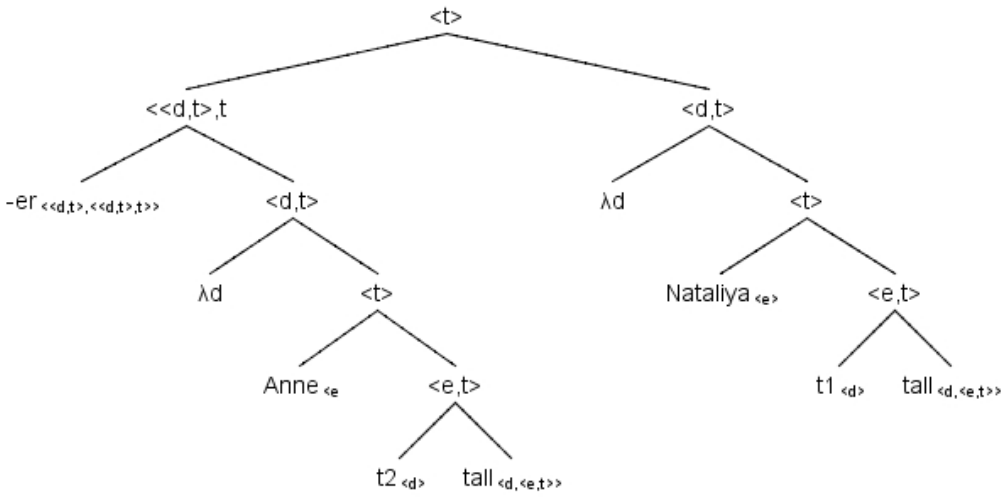
type: <<d,t>,<<d,t>,t>>

[8] From here on, this is again following Beck (to appear)

The LF is this; the calculation of the truth conditions (sketched in 35)c.) is entirely analoguous to the one of the clausal comparatives:

35)a.[er$_{clausal}$ than [2 [Anne [~~XP~~ is t_2 tall]]]] [1 [Nataliya is t_1 tall]]

b.



c. ⟦-er 2 Anne t_2-tall 1 Nataliya t_1-tall⟧ =1 iff

⟦-er⟧ (⟦2 Anne t_2-tall⟧) (⟦1 Nataliya t_1-tall⟧) =1 iff

[λD_1.λD_2.max(D_2) > max(D_1)](λd. Anne is d-tall)

(λd.Nataliya is d-tall) =1 iff

max(λd. Nataliya is d-tall) > max(λd. Anne is d-tall)

'the maximal degree to which Natliya is tall >

the maximal degree to which Anne is tall'.

2.4 The equative

Equatives are semantically quite similar to comparatives. The only difference in meaning is that the relation expressed is different[9].

36) Mary is as tall as Kitty is.

37) ⟦as⟧ = λD_1.λD_2. max (D_2) ≥ max (D_1)

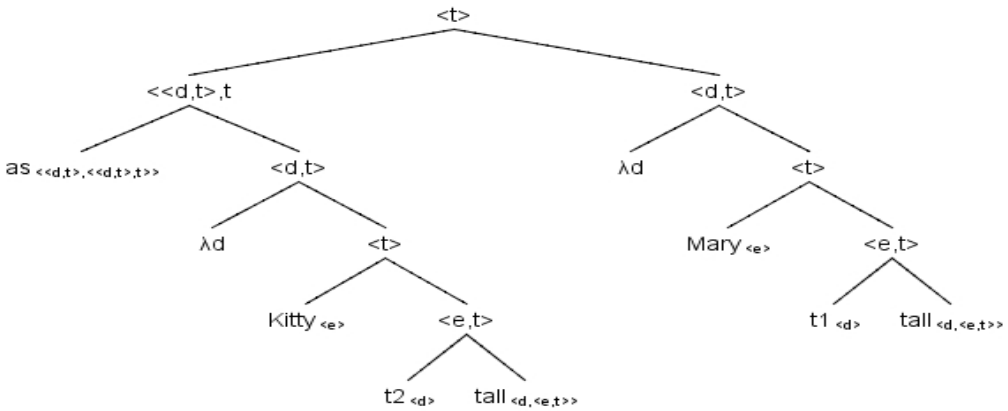
type: <<d,t>,<<d,t>,t>>

[9] The motivation for that comes after the LF and the calculation.

The LF is analogous to the comparative, as is the derivation.

38) a.[[as [1 [Kitty is t_1 tall]]] [2 [Mary is t_2 tall]]]

b.



c. ⟦as 2 Kitty t_2-tall 1 Mary t_1-tall⟧ =1 iff

⟦as⟧ (⟦2 Kitty t_2-tall⟧) (⟦1 Mary t_1-tall⟧) =1 iff

⟦as⟧ (λd. ⟦Kitty t_2-tall⟧) (λd. ⟦Mary t_1-tall⟧) =1 iff

⟦as⟧ (λd. Kitty is d-tall) (λd. Mary is d-tall) =1 iff

[$\lambda D_1.\lambda D_2$. max (D_2) ≥ max (D_1)] (λd. Kitty is d-tall)
(λd. Mary is d-tall) =1 iff

max(λd. Mary is d-tall) ≥ max(λd.Kitty is d-tall) =1 iff

'the maximal degree to which Mary is tall ≥
the maximal degreeto which Kitty is tall.'

Due to the meaning of *as*, the sentence means that Mary is at least as tall as Kitty. On first sight, it is surprising why it should be '*at least as Adj as*' and not '*equals*'. But considering the following sentence, this understanding of the equative becomes immediately clear:

39) Mr Darcy is as rich as Mr Bingley is, if not richer.

This sentence is perfectly acceptable and the meaning of the equative is able to capture this meaning as well. The implicature that Mr Darcy has acquired equal wealth as Mr Bingley is cancelled through *if not richer* and now it seems possible that Mr Darcy is in fact better off than Mr Bingley.

His wealth can be = or > than Mr Bingley's, which is expressed through the ≥ - relation.

2.5 The positive and related matters

There are cases in which comparison is not made explicit; it is not always necessary to state explicitly the item of comparison – as is illustrated in 40) below .

40) a Nataliya is tall.
b Wolfgang is rich.

In order to interpret the positive, von Stechow (1984) introduced the positive operator POS which is provided in 43). He assumes that there is a neutral area on the relevant scale which is expressed by neither of the antonyms. By using the positive it is expressed that an individual is not within the neutral area, but just beyond it in the right direction.
To complete the framework, antonyms come into play here. There is the neutral area, the area in the right direction, i.e. the positive form of the adjective, and finally the area in the left direction with the meaning of the antonym.
An example to illustrate the idea:

41) *tall*

|----------|----------|---------->∞
small (not tall) neutral area tall (not small)

Illustrating 35.a, it looks like this:

42)aNataliya is tall.
b |----------|----------|---------->∞
Height (N)

43) $[\![POS_{N,S}]\!]^g = \lambda A_{<d,t>}.(\forall d \in N(S))A(d)$

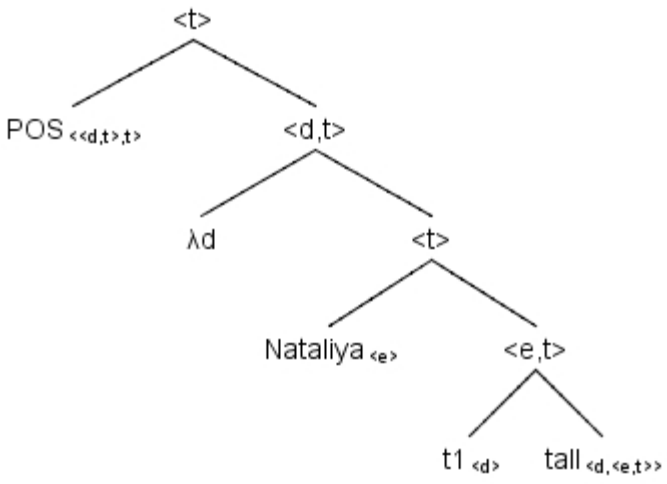
type <<d,t>,t>

Von Stechow says that the POS-operator "(…) depends on two parameters, the contextually relevant initial segment of the tallness scale and a function *N* that gives the neutral segment of the scale. In other words, the Pos-operator is a universal quantifier over degrees that is restricted by the neutral degrees of the contextually relevant scale."[10]

At LF, POS is QRed from the same position where the degree argument slot usually is located:

44) a.[$POS_{N,S}$ [Nataliya is [t_1-$tall_S$]]]

b.



c. ⟦$POS_{N,S}$ 1 Nataliya t_1-$tall_S$⟧ =1 iff

⟦$POS_{N,S}$⟧ (⟦1 Nataliya t_1-$tall_S$⟧) =1 iff

⟦$POS_{N,S}$⟧ (λd. Nataliya is d-$tall_S$) =1 iff

[$\lambda A_{<d,t>}$.(∀d∈ N(S))A(d)](λd. Nataliya is d-$tall_S$) =1 iff

∀d∈N(S))(λd. Nataliya is d-$tall_S$)

Usually, syntactic negation takes scope over POS. If negation takes narrow scope with respect to POS, it is realized as the negative pole of the antonym[11]. Von Stechow eplains this with the fact that negation with

[10] (Stechow, Times as Degrees, 2006d, p. 6)

[11] (Stechow, 2006d, p. 6)

narrow scope is usually realised via the negative pole of the antonym pair.[12]

It is possible to calculate the antonyms analogously. The following theory of antonyms is adopted (e.g. Heim 2006):

45)a ⟦tall⟧ = λd.λx. Height(x) ≥ d

b ⟦short⟧ = ~λd.λx. Height(x) ≥ d

=λd.λx. Height(x) < d

The following sentence does not necessarily mean that she is short; it is also possible that her height lies within the neutral area:

46) a Nataliya is not tall

b ~POS(λd. Nataliya is d-tall) iff ∀d[d∈ L_C -> Height(N) ≥ d]

c |----------|------**N**----------|----------->∞

small (not tall) neutral area tall (not small)

|------**N**----------|----------|----------->∞

small (not tall) neutral area tall (not small)

The interpretation of the positive depends on the context, as the semantics for POS shows.

To capture antonyms properly, it is according to Heim (2006) necessary to change the semantics for *–er* slightly.

47) a ⟦$-er_{antonyms}$⟧ = $\lambda D_{1<d,t>}. \lambda D_{2<d,t>}. \lambda D_1 \subset \lambda D_2$

This change was necessary, because there is no maximum of degrees to which the *than*-clause is true. (c.f.46)b: =λd.λx. Height(x) < d).

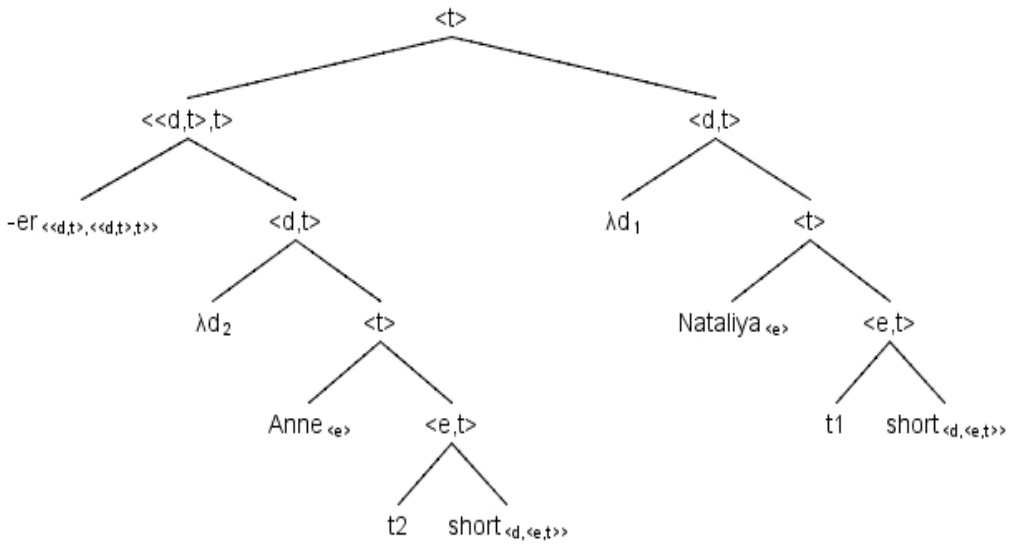
48) a Anne is shorter than Nataliya is.

b λd. Height (N) < d

[12] Ebd.

With the altered lexical entry for the use with antonyms, we get the following result:

49) a.



b.LF: [er [1 [Anne is t_1 short]] [2 [Nataliya is t_2 short]]]

c. ⟦er⟧ (λd.Height (A)<d) (λd.Height(N)<d) =1 iff

(λd.Height (A)<d) ⊂ (λd.Height(N)<d)

'The degrees of Height above Anne's height are a subset of the degrees of Height above Nataliya's height.

To complete this overview of the positive, one option still misses: the 'opposite' of more – less.
Consider:

50) Anne is less tall than Nataliya.

Of course, it is tempting to analyze *less* simply with the reversed relation than *more*:

51) ⟦less⟧ = $\lambda D_1.\lambda D_2.\max(D_2) < \max(D_1)$

Tempting as it may be, using this interpretation one is however unable to derive certain ambiguities, but for our purposes, we leave it at that.

2.6 The superlative

To understand that there is a connection between comparatives and superlatives, it is helpful to consider the following two sentences:

52) a Caroline is the tallest.
b Caroline is taller than anyone else.

As we can see, the superlative does not indicate the item of comparison. Following Heim(2001), Beck(to appear) suggests the following semantics:

53) ⟦-est⟧ =λC. λR $_{<d,<e,t>>}$.λx.max (λd.(R(d)(x)) > max (λd.∃y ≠ x & C(y) [R(d)(y)])

In words: the maximum that x reaches exceeds the maximum reached by any other y.
The superlative gives rise to the absolute vs. relative ambiguity:

54)a Sally climbed the highest mountain.
b Sally climbed a higher mountain than anyone else did.
relative
c Salle climbed a mountain higher than any other mountain
absolute

It is possible that those readings are due to the syntactic scope the superlative morpheme takes:

55)a [Sally [-est [1 [climbed a t_1 high mountain]]]] **relative**
b ⟦est⟧ (λd.λz. z climbed a d-high mountain) (Sally)

56)a [Sally [climbed the [-est [1 [t_1 high mountain]]]]] **absolute**

b Sally climbed the (λx. ⟦est⟧ (λd. λz. z is a d-high mountain)(x))

This is, of course, a very superficial overview of the interpretation of superlatives. For a more detailed discussion, see chapter 4. Here, scopal Hindi comparatives and superlatives is compared to the behaviour of English comparatives and superlatives.

2.7 Measure-phrase constructions and differentials

It is possible for adjectives to combine with degree denoting expressions, which are called measure phrase constructions.
Consider:

57) I hope you saw her petticoat, **six inches deep in mud.**

Remember the lexical entry for adjectives, here *deep*:

58) ⟦deep⟧ = λd.λx. x is d-deep
Λd.λx.Depth(x)≥x

The whole phrase *six inches deep*, then, denotes the following:

59) ⟦six inches deep⟧ = ⟦deep⟧ (6")
= λx. x is 6" deep
= λx.Depth (x)≥6"

Taking this lexical entry seriously, *at least* can be realized overt or covert as it is always a part of the meaning of the adjective. But it is also possible to get an *exactly* or *at most* reading by using the respective expressions:

60) Nataliya is at least/exactly/at most 6' tall.

Beck(to appear) follows von Stechow (1984) in interpreting them as quantifiers over degrees of type <<d,t>,t>:

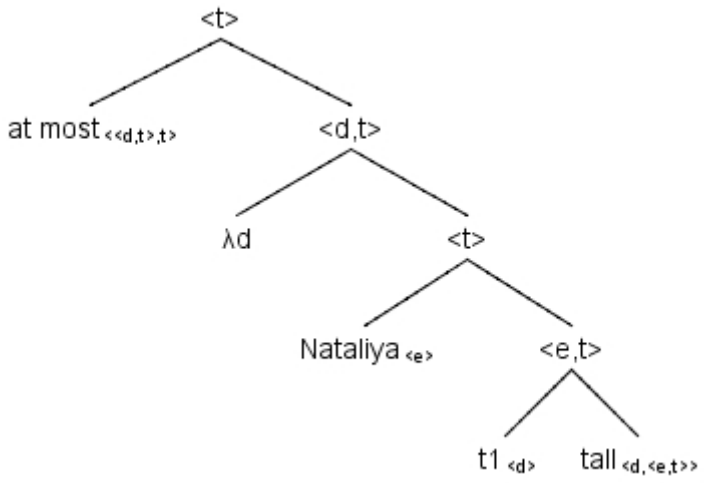
61) a. ⟦at least⟧ = λd.λD. max (D) ≥ d

b. ⟦exactly⟧ = λd.λD. max (D) = d

c. ⟦at most⟧ = λd.λD. max (D) ≤ d

Interpreting 60) we get the following result:

62)a.



b. ⟦[[at most 6'] [1[Nataliya [t_1-tall]]]]⟧ = 1 iff

[⟦≥⟧ (6') ([1[Nataliya [t_1-tall]]])] = 1 iff

[⟦≥⟧ (6') (λd.Nataliya is d-tall)] = 1 iff

[[λd.λD.max (D) ≥ d] (6') (λd. Nataliya is d-tall)] = 1 iff

max (λd. Nataliya is d-tall)] ≥ 6' =

Height(Nataliya) ≥ 6'

With difference degrees, it is quite similar: measures are taken as quantified measure phrases. Note that measures take scope over difference degrees. Consider the following example and its interpretation:
To get the meaning of the following sentence, the meaning of *–er* has to be revised:

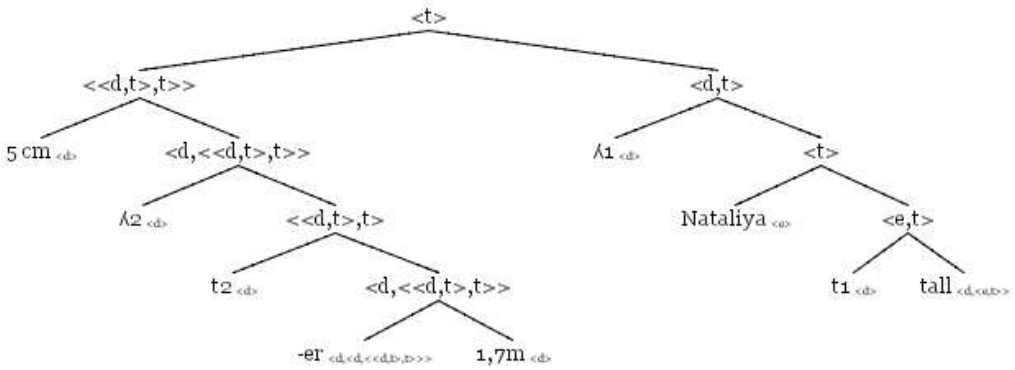
63) a(Anne is 1,7m tall.) Nataliya is (exactly) 5cm taller than that.

b ⟦er⟧ = λd'.λd.λP. max(P) = d+d'

type: <d,<d,<<d,t>,t>>>

Applied to 63) we get the following LF:

64) a.



b. [[5 cm [2 [t_2 [-er 1,7m]]]] [1 [Nataliya [t_1 tall]]]]

⟦[5 cm 2 t_2 –er 1,7m 1 Nataliya t_1 tall]⟧ =1 iff

⟦5 cm 2 t_2 –er 1,7m⟧ (⟦1Nataliya t_1 tall⟧) =1 iff

[⟦2 t_2 –er 1,7m⟧ (⟦5 cm⟧)] (λd_1 ⟦Nataliya t_1 tall⟧ $^{g[d/1]}$) =1 iff

[λd_2. ⟦t_2-er 1,7m⟧ $^{g[d/2]}$ (5 cm)] (λd_1. ⟦t_1 tall⟧ $^{g[d/1]}$ (N)) =1 iff

[λd_2. ⟦-er⟧ (1,7m) (d) (5 cm)](λd_1. ⟦tall⟧ (d) (N)) =1 iff

[λd_2.[$\lambda d'.\lambda d.\lambda P$. max(P) = d+d'] (1,7m) (d) (5 cm)](λd_1. [$\lambda d.\lambda x$. x is d-tall] (d) (N)) =1 iff

[λP. max(P)=1,7m + 5cm] (λd. Nataliya is d-tall) =1 iff

max(λd. Nataliya is d-tall) = 1,7m + 5cm =1 iff

the maximal degree to which Nataliya is tall =1,75m

2.8 Degree Questions

Degree questions are able to show that abstraction over degrees is a successful analysis, because their LF makes overt that there is indeed an argument slot for degrees[13]:

65)a. How high is the desk?

[13] This account of degree questions is taken from Beck (to appear)– I won't be able to go much into the semantics of interrogatives, for fundamentals c.f.(Hamblin, 1973), (Karttunen, 1977)

b. [Q[wh1[the desk is t1 high]]]

c. ⟦Q⟧ (λd. the desk is d-high)

d. for which d: the desk is d-high

As we can see, the wh-phrase originates at the same position as the degree which is the reason why degree questions are taken as an argument in favor of abstracting over degrees.

2.9 Closing remarks

This was a short overview of the standard English comparative interpretation. It is designed to show the fundamentals of the framework. In the following two chapters, the framework will be expanded to explain how Hindi comparative constructions can be interpreted and how they differ from their English counterparts.

Chapter 3. Comparison constructions in Hindi

3.0 Starting point: Hindi and B17

In this chapter, an analysis for Hindi comparison constructions is presented.

The Hindi sentences presented here are a part of the empirical work which was done as a part of SFB 441, project B17. The starting point of B17(accepted) was to collect data in 14 different languages concerning a multitude of different comparison constructions. For that purpose, an identical questionnaire for all those languages was designed and then presented to naive informants.

The results of the empirical work in contrast to English is presented in short in order to serve as an overview[14]:

66)

Comparatives	**English**	**Hindi**
Phrasal, predicative	☑	☑
Phrasal, adverbial	☑	☑
Phrasal, NP-internal	☑	☑
Clausal	☑	*
Comparison with a degree	☑	☑
Negative comparative	☑	☑
Intensifier	☑	☑
Equatives	☑	☑
Positives	☑	☑
Superlatives	☑	☑
Subcomparatives	☑	*
Measure-phrase constructions	☑	☑
Differentials	☑	☑
Degree questions	☑	☑
Intensional comparison	☑	-
Scope	☑	☑
Negative Island effects	☑	**n/a[15]**
Variability in acceptability	☑	**No**

[14] The complete survey is to be found in (Beck, et al., accepted)

[15] Since there are no clausal comparatives in Hindi, we cannot test Negative Island Effects in Hindi, either.

Before starting out on presenting the comparison constructions, a few words about Hindi as a language in general and syntactic peculiarities are in order.

Hindi is an Indo-European language which is spoken by around 380 million people in India – but it is hard to identify a definite number, for there is a big diaspora all over the world.

Hindi is not, as well as many other languages, homogenous, but

> "(…) the label 'Hindi' covers considerably distinct speeches, as evidenced by the number of regional varietes covered by the category Hindi in the various *Censuses* of Inida (…). On the other end, the notion that Standard Hindi, more or less corresponding to the variety used in written literature and media, does not exist as a mother tongue, has gained currency during the seventies and eighties (…)." Montaut (2004, p. 1)[16]

Those facts have, of course, to be considerend when embarking on a emprical study about the Hindi language. Nonetheless, it was possible to find 5 Hindi native speakers who were willing and able to take part in it. The course of action was to confront the informant with a given situation. He (for it were all males) then had to judge whether a given sentence was good or not. To illustrate this, consider the situation and sentence for plain phrasal comparatives:

67) *Suppose that Sangītā is 1,72m(5'6") and Ramesha is 1,70m(5'4"). Can you say the following sentence?*

Sangītā	Rameshaa	se	lambī	hai.
Sangītā	Ramesha	SE	tall.fem	is

Sangītā is taller than Ramesha

Ok [ok/5(5)]

In a similar fashion, all data about comparatives in this chapter (and chapter 4) was collected.

Before presenting the findings, a few words about the hindi language. In the findings, a very prominent word order is to be seen: **S**ubject-**O**bject-

[16] (Montaut, 2004, p. 1)

Verb. But this does in no way mean that this is the only possible word order in Hindi. Interestingly, in the literature, either a rigid SOV-order is proclaimed, or a free word order. The unmarked word order is, indeed, SOV. Monaut (2004) lists some implicational universals in favour of this claim posed by (Greenberg, 1966), namely postpositions, genitive preceding the governing noun, adjective preceding the noun, no rule requirement for question words to be in the first position, dependent verbs preceding the main verb, standard-marker-adjective order for comparison of superiority. But in oral Hindi, the notion of markedness is not relevant – and the rigid word order likewise. Consequently, scrambling is allowed, mostly to express focus or indicate topic.

3.1 Phrasal comparatives

This proposal to interpret Hindi comparative structures adopts Heim's (1985) approach for the interpretation of comparatives.
Assigning her approach to Hindi, gradable adjectives have the following denotation:

68) $[\![adj_{grad}]\!] = \lambda d \in D_d. \lambda x \in D_e.\ x\ d\text{-}adj_{grad}$

$\lambda d \in D_d. \lambda x \in D_e.\ Height(x) \geq d$

Type <d,<e,t>>

The comparative operator *jyādā* gets a meaning which is designed exactly like Heim's (1985) comparison morpheme:

69) $[\![jyādā_{simple}]\!] = \lambda x \in D_e .\lambda P \in D_{<d,<e,t>>}.\lambda y \in D_e.\ max$

$(\lambda d'.P(d')(y)) > max\ (\lambda d''P(d'')(x))$

<e,<<d,<e,t>>,<e,t>>>

70) Sangītā Ramesh se **(jyādā)** lambi hai.
Sangītā Ramesh SE **(more)** tall.fem is
Sangītā is taller than Ramesh.

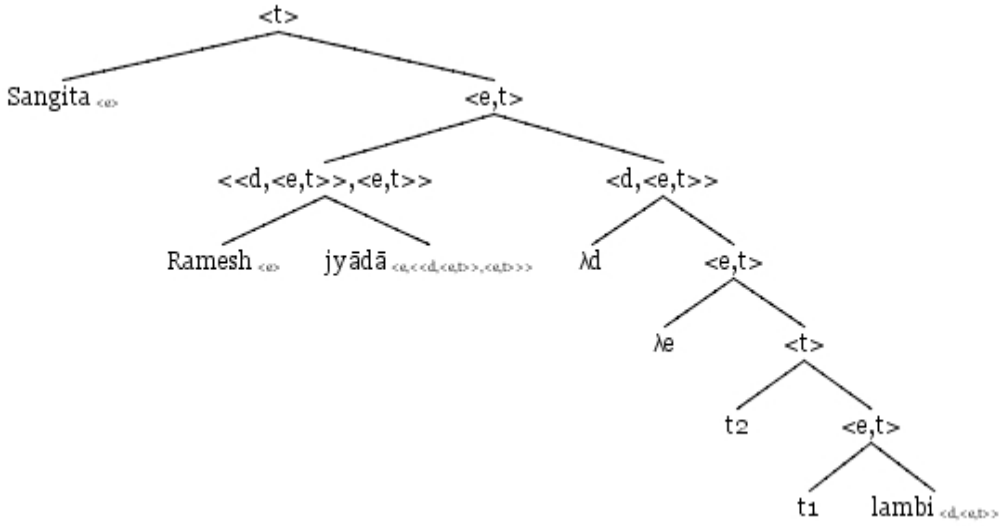
Note that jyādā does not necessarily have to be realized overtly. 70) can also be paraphrased as 'Sangita is tall, compared to Ramesh' – which is synonymous to 'Sangita is taller than Ramesh.' Bhatt & Takahashi (2007, p. footnote 7) note that jyādā can be covert with adjectives like *lambaa (tall)*, whereas jyādā has to be realized overtly with *utsuk (eager)* and attributive comparatives.

The postposition *se* is used to mark the the remnant.

In Hindi, there is only one restriction on the order of the associate and the remnant: the remnant has to precede *jyādā (more)*. Other than that, the remnant may precede the associate and it is possible that there is material between the associate and the remnant. The reason for this is that the than-phrase is an argument of *jyādā,* and arguments always precede their heads in Hindi. [17]

The proposed LF for 70) is this:

71) LF



And the calculation of the truth conditions:

72) [Sangita [Ramesh jyādā] [1 [2 [t_2 [t_1- lambi]]]]] =1 iff

⟦jyādā⟧ (Ramesh) (λd.λx. x d-lambi hai) (Sangita) =1 iff

[17] C.f. (Bhatt & Takahashi, Direct Comparisons: Resurrecting the Direct Analysis of Phrasal Comparatives, 2007)

[λx.λP.λy. max(λd'.P(d')(y))> max(λd''.P(d'')(x))](R)(λd.λx.x is d-tall) (S) =1 iff
max (λd'. Sangita d'-lambi hai) >max (λd''. Ramesh d''-lambi hai)
Height(Sangita) > Height (Ramesh)

This interpretation of phrasal comparatives turns out to be identical with Bhatt & Takahashi's (2007) account, which is labelled **D**IRECT **A**NALYSIS (DA) there. This means that the comparative is interpreted directly and not taken as a reduced clausal comparative (**R**EDUCTION **A**NALYSIS (RA)), which is another possibility to interprete phrasal comparatives.
In order to show the advantages of this account and the DA, they refer to the fact that phrasal comparatives in many languages allow multiple remnants, but not Hindi: '*the single remnant restriction*' – which gets predicted by the Direct Analysis, but not the Reduction analysis[18].
As it can be seen in 73), it is not possible in Hindi to use multiple remnants in phrasal comparatives. Instead, one has to revert to a correlative sentence (in 74))to express the meaning of 73)a.:

73) a. Tina read more books today than **Pim yesterday**.
b.*Tina-ne aaj [**Pim kal-se**] jyādā kitaabé paṛh-ĩ.
Tina-Erg today [Pim yesterday] more books read
'Tina read more books today than Pim yesterday.'

74) [**Pim-ne** **kal** jitni kitaabé paṛh-ĩ]
Pim-Erg yesterday as much books read]

[Tina-ne aaj us-se jyādā kitaabé paṛh-ĩ.]
Tina-Erg today so much more books read]
'As much books Pim read yesterday, so much more books Tina read today.'
Tina read more books today than Pim yesterday.

[18] Remember that B&T propose the RA for English phrasal comparatives.

The Reduction Analysis treats comparatives with multiple and single remnants alike – which gives the wrong predictions for Hindi.
The *Single Remnant Restriction* is unaccounted for by the RA.
They speculate that the reason for the Reduction Analysis being ruled out in Hindi is an interaction between *–se* and finite clauses. It is important to take into account that the relevant ellipsis processes are limited to finite clauses. They can never appear as complements of *–se* or other postpositional elements in Hindi:

75) a. John has been happy [since [Mary arrived]].
b. *John [Mary aa-ii hai]-se khush hai.
John [Mary arrived is]-SE happy is.
Intended: John has been happy since Mary arrived.

Again, Hindi reverts to a correlative construction:

76) [**jab**-se Mary aa-ii hai] [**tab**-se John khush hai].
[when-from Mary arrived is] [then-from John happy is]
Lit.:'Since Mary arrived, John has been happy.'
John has been happy since Mary arrived.

The correlative structure uses a pronoun as a complement for *–se*. The finite clause, then, is associated with the pronoun.
In Hindi, therefore, the 3-place comparative operator is used to interpret phrasal comparatives instead of the 2-place comparative operator as it is used in English.

3.1.1 Clausal comparatives

It is not possible in Hindi to use a similar structure to the one in English to express clausal comparatives. Consider:

77) *Āj **maine** **socha** tha se jyādā garam hai.
Today **I** **think** past SE more hot is

It is hotter today than I thought.

Alternatively, Hindi uses a correlative structure:

78) Āj **us** se jyādā garam hai
Today **so much** SE more hot is
jitnā maine socha tha.
as much I think past
'Today it is more hot than I thought:'
It is hotter today than I thought.

In the literature, this kind of correlative is called equative correlative, because it uses *jitna*, the Hindi equative operator.[19]
A proposal for interpretation and a thorough discussion is postponed to chapter 4.
As can be seen in the following parts of this chapter, the DA is very successful for Hindi comparison constructions.

3.1.2 Comparison with a degree

With this expression, those structures are all labelled where the item of comparison is a degree.
Consider:

79) Sangita **5'4"** se jyādā lambi hai.
Sangita **5'4"** SE more tall is
Sangita is taller than 1,7m (5'4").

The lexical entry for jyādā has to be revised to interpret comparisons with a degree, other than that, no changes are necessary:

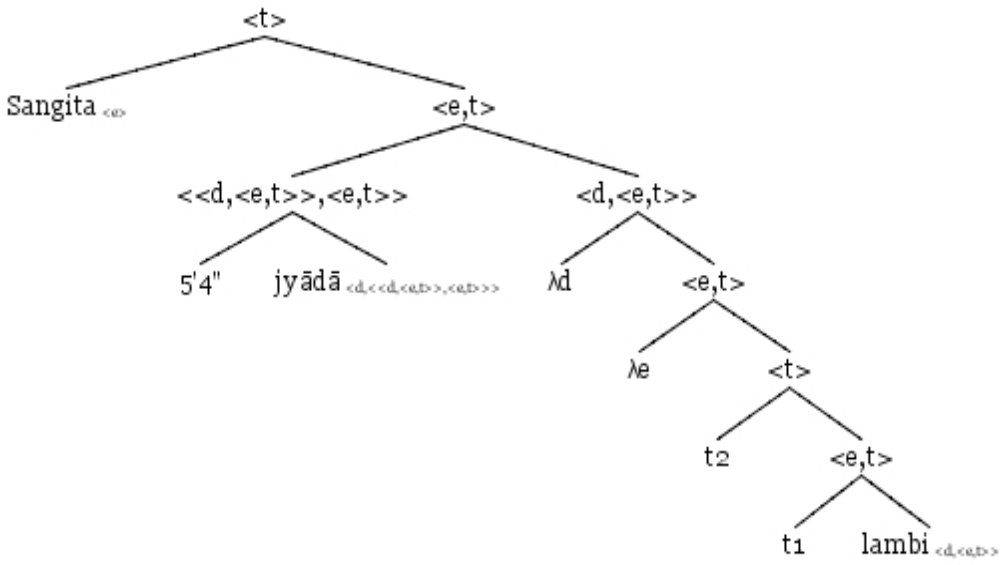
80) $[\![\text{jyādā}_{\text{degree}}]\!] = \boldsymbol{\lambda d}_{<\mathbf{d}>}.\lambda P_{<d,<e,t>>}.\lambda x_{<e>}.\ \max(\lambda d'.\ P(d')(x)) \geq d$
of type <d, <<d,<e,t>>,<e,t>>>

[19] C.f. Bhatt(Lahiri, 1998)(2008) and others

Similar to the structure of phrasal comparatives, we get the following LF and truth conditions:

81) a.[Sangita [[5'4" jyādā][1[2[t-$_2$ lambi hai]]]]]

b.



c. max(λd'. Sangita d'-lambi hai) ≥ 5'4"
Height(Sangita) ≥ 5'4"

3.1.3 The particle *bhii* ("even")

Consider the following example:

82) Sangita Ramesh se bhii jyādā lambi hai.
Sangita Ramesh SE even more tall is
Sangita is even taller than Ramesh.

The sentence does not only mean that Sangita is taller than Ramesh, but there is the assumption that this is the least expected of all cases.

Following Lahiri's (1998, p. 86)[20] account of focus-sensitive *bhii*, of type <s,<<<s,t>,t>,<<s,t>,t>>>, similar to *even*, it contributes a scalar presuppostion:

[20] Note that the notation is adapted in order to be similar to the rest in Heim & Kratzer framework.

83) $\lambda w.\lambda C \in D_{<<s,t>,t>}.\lambda q \in D_{<s.t>}.\forall p \in D_{<s,t>}[[C_w(p) \& p \neq q] \rightarrow$
$\text{LIKELIHOOD}_w(p(w)) > \text{LIKELIHOOD}_w(q(w))]$

This will yield the following:

84) LF: [bhii_w C_w [λw_1 [Sangita [Ramesh jyādā]
[1[2[t_2 t_1 lambi_{w1} $\text{hai}_\emptyset$]]]]]

$[\![\text{bhii}_w\ C_w]\!]$ (λw_1.[Height_{w1}(Sangita) > Height_{w1}(Ramesh)])=1 iff
$\forall p[[C_w(p) \& p \neq \lambda w'.\ \text{Height}_{w'}(\text{Sangita}) > \text{Height}_{w'}(\text{Ramesh})]$
$\rightarrow \text{LIKELIHOOD}_w(p(w)) > \text{LIKELIHOOD}_w(\text{Height}_w(\text{Sangita}) > \text{Height}_w(\text{Ramesh})]$

C is a silent restrictor variable that restricts all propositions to those relevant to the context:

85) $C_w = \lambda w.\ \lambda p_{<s,t>}.\ \exists x \in D_e\ [C_w(x) \& p = \lambda w'.\text{Height}_{w'}(\text{Sangita}) > \text{Height}_{w'}(x)]$

To illustrate this, take the following situation:

86) *There are four people in the room: Sangita, Ramesh, Pratap and Vinod. Ramesh is the tallest of the men and Sangita is even taller than him, which is least likely.*

So, the other relevant propositions to this context are:

87){that Sangita is taller than Pratap, that Sangita is taller than Vinod }

In 88), b*hii* with the meaning of *even*[21] puts focus on the item of comparison. As we can see in the following examples, it is the case that *bhii* puts focus on the element which is located directly before[22] it:

88) a. Sangita Ramesh ya Pratap se jyādā dhani hai.
Sangita Ramesh or PratapSE more rich is
Sangita is richer than Ramesh or Pratap

b. Sangita **bhii** Ramesh ya Pratap se jyādā dhani hai.
Sangita **even** Ramesh ya Pratap SE more rich is
Even Sangita is richer than Ramesh or Pratap.

c. Sangita Ramesh ya Pratap se **bhii** jyādā dhani hai.
Sangita Ramesh or Pratap SE **even** more rich is
Sangita is richer than even Ramesh or Pratap.

d. Sangita Ramesh ya Pratap se jyādā dhani **bhii** hai.
Sangita Ramesh or Pratap SE more rich **even** is
'(Among other things), Sangita is even richer than Ramesh or Pratap.

As we can see, *bhii* modifies the item that is directly preceded by it.

3.2 Equatives

The interpretation which is given the Hindi equative structure is similar to the interpretation for the English equative structure: analogous to the comparative but expressing a slightly different relation, namely *at least*. Consider the following example:

89) Sangita Ramesh **jitna** lambi hai.
Sangita Ramesh **so much** tall is
Sangita is as tall as Ramesh.

The lexical entry for *jitna*, then, is similar to the one of *jyādā*:

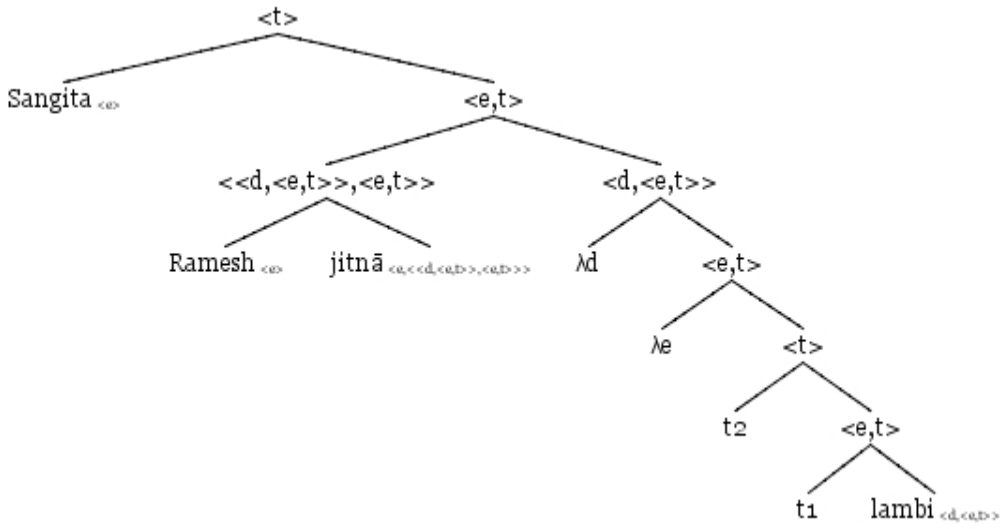
[21] As Lahiri(1998) points out, *bhii* without focus means *also*.
[22] These sentences are from the survey which is the basis of the work.

90) ⟦jitna⟧ = λx ∈ D_e .λP ∈ $D_{<d,<e,t>>}$.λy ∈ D_e. max(λd'.P(d') (y)) ≥ max (λd''.P(d'')(x))

Type: <d,<<d,<e,t>>,<e,t>>>

Equatives with the structure of 89) have this LF:

91) Equative LF:



Finally, consider the calculation of its truth conditions:

92)[Sangita[[Ramesh jitani] [1[2[t_2[t_1 lambi]]]]]] =1 iff

[⟦jitani⟧ (⟦R⟧)] (⟦[1[2[t_2[t_1 lambi]]]]⟧) (⟦S⟧) =1 iff

[⟦jitani⟧ (R)] (λd.λx.[⟦lambi⟧ $^{g[d/1]}$ (⟦t_2⟧ $^{g[x/2]}$)]) (S) =1 iff

[⟦jitani⟧ (R)] (λd.λx.x is d-tall) (S) =1 iff

[λx.λP.λy. max(λd'.P(d')(y)) ≥ max (λd''P(d'')(x))]

(R) (λd.λx.x is d-tall) (S) =1 iff

max(λd'. S is d'-tall) ≥ max (λd''. Ramesh is d''-tall)

Sangita's height ≥ Ramesh's height

'the maximal degree to which Sangita is tall is larger than or equal to the maximal degree to which Ramesh is tall.'

3.3 The positive and related matters

In Hindi, the structure of the positive is not very different from the comparative, but overtly there is no item of comparison:

93) Sangita lambi hai.
Sangita tall is
Sangita is tall.

The Hindi positive can be interpreted analoguous to the English positve – it is also possible to give POS the same meaning.

94) a. $[\![POS_C]\!] = \lambda D.\ \forall d\ [d \in L_C \rightarrow D(d)]$
b. $[\![lambi]\!] = \lambda d.\lambda x.\ Height(x) \geq d$

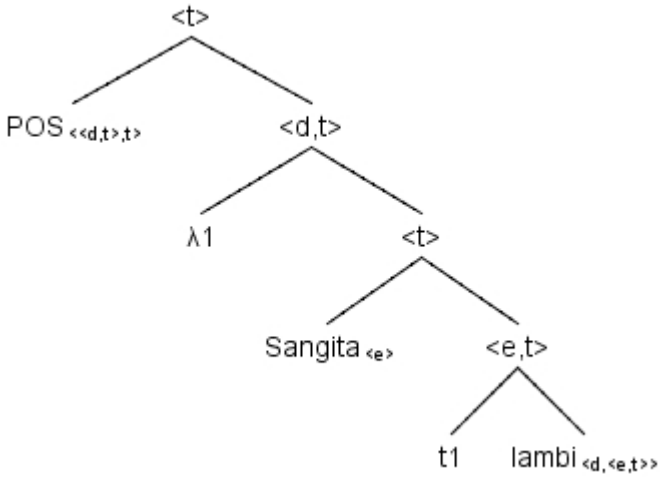
Together with the standard meaning of the adjective, the interpretation of 93) is straight forward:

95)a.LF: $[POS_{<<d,t>,t>}\ [1\ [Sangita\ [t_1\ lambi\ hai]]]]$

$[\![POS]\!]\ (\lambda d.\ Height(Sangita) \geq d)$

$\forall d[d \in L_C \rightarrow Height(Sangita) \geq d]$

b.



Thinking about the positive leads to think about their "negative" counterparts: antonyms.

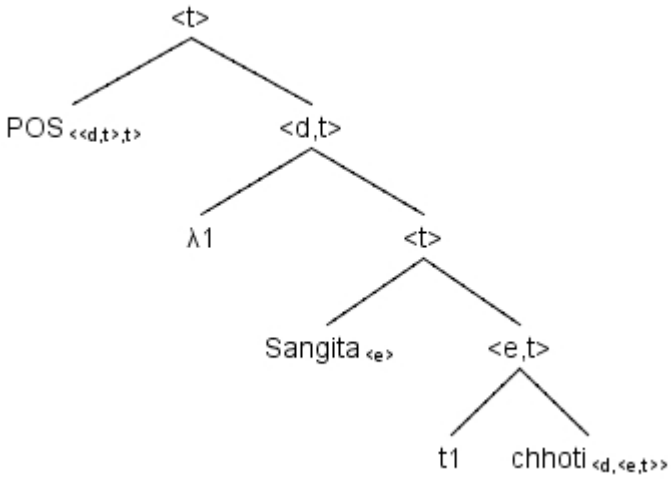
96) Rameshaa chhotā hai.
Ramesha short.masc is
Ramesha is short.

As in English, the adjective *chhota (short)* gets the following meaning, with the effect that the LF is already familiar[23]:

97)a. ⟦chhota⟧ =λd.λx. Height(x)< d

b. LF: [$POS_{<<d,t>,t>}$[1[Ramesha [t_1 chhota hai]]]]

c.



Having dealt with antonyms appearing in positive sentences leads to think about the treatment of antonyms or constructions with *kam (less)* in comparative sentences.
Consider:

98) Sangita Ramesh se **chhoti** hai.
Sangita Ramesh SE **small** is
Sangita is smaller than Ramesh.

[23] At this point, a further look at the question whether there is evaluativity in Hindi or not would be fruitful – but it is not possible for matters of time and space. A first step would be to consult Krasikova(accepted).

To keep it simple, the meaning of *chhoti* expresses the opposite relation than its antonym, also being of type <d,<e,t>>. To be equal with English, the lexical entry of *jyādā* also has to be adjusted.
Consider :

99) a. ⟦chhoti⟧ = $\lambda d \in D_d. \lambda x \in D_e.$ Height(x)<d

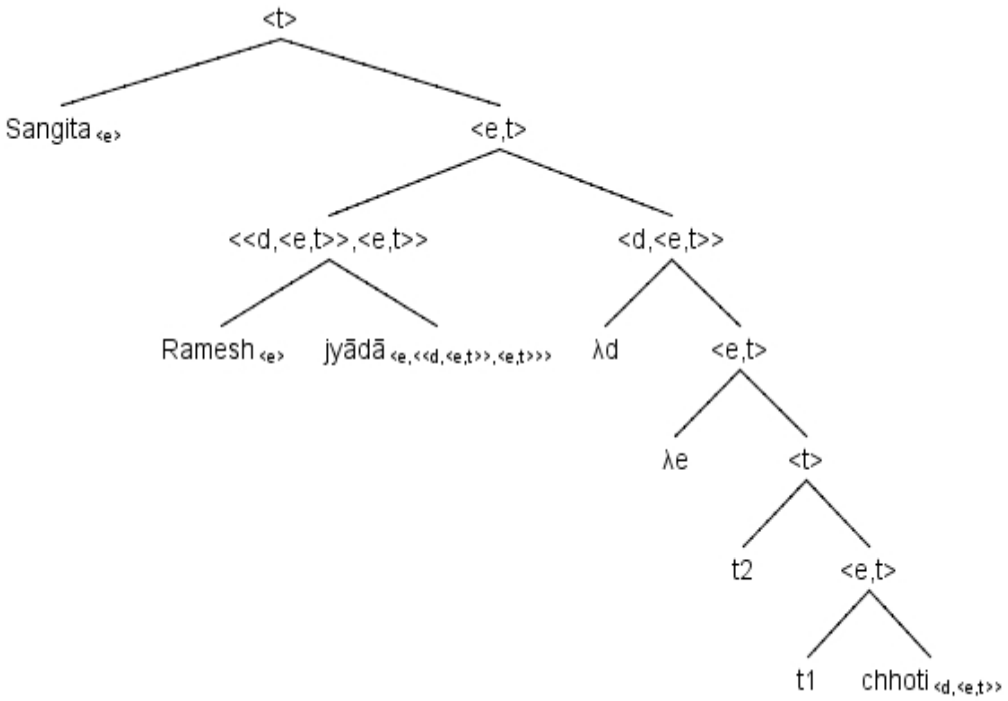
b. ⟦jyādā⟧ = $\lambda D_1.\lambda D_2.\ D_1 \subset D_2.$

The LF and truth conditions are accordingly:

100) a.[Sangita [Ramesh jyādā] [1[2[t_2 t_1 chhoti]]]]

b. (λd. Height(Sangita) ⊂ (λd. Height(Ramesh)

c.



Remember that *jyādā* together with *lambi (tall)* doesn't have to be realized overtly.
Now, one option is still missing: the comparative with *kam (less)*. Consider the following sentence:

101) Sangita Ramesh se **kam** lambi hai.

Sangita Ramesh SE **less** tall is
Sangita is less tall than Ramesh.

The meaning for *kam (less)* is analogous to the one for jyādā; only the taller-than relation gets reversed to a smaller-than relation:

102) $[\![\text{kam}]\!] = \lambda x \in D_e . \lambda P \in D_{<d,<e,t>>} . \lambda y \in D_e . \max(P(y)) < \max(P(x))$

So, 101) can be paraphrased as 'The maximal degree of height Sangita reaches is smaller than the maximal degree of height Ramesh reaches'.

3.4 The superlative

The Hindi superlative is derived from the comparative and an additional reference group which is usually realized by a quantifier.
In contrast to English, it is always necessary to state a reference group to express superlative meaning in Hindi, c.f. 104)105)106). This is due to the fact that there is no such thing as a superlative morpheme in Hindi.
Remember the lexical entry for the English *est*, the superlative morpheme following Heim (1985):

103) $[\![\text{est}]\!] = \lambda R_{<d,<e,t>>} . \lambda x . \max(\lambda d'.R(d')(x)) > \max(\lambda d''.\exists y \neq x [R(d'')(y)])$

This lexical entry states that the maximal degree reached by x exceeds the maximal degree reached by at least one other person y which is not identical with x.
Hindi on the other hand does not need such an lexical entry, because the Hindi superlative construction is closely connected to the comparative: to the comparative operator *jyādā* an explicit reference group *mein saba (of all)* - which has to capture the superlative meaning- is added.
Remember that jyādā does not have to be realized overtly with *lambi (tall)*:

104) Sangītā laṛkiyo **mein** **saba** se lambī hai.
Sangītā girls **of** **all** SE tall is
'Sangita is the tallest of all girls.'
Sangītā is the tallest girl.

105) Sangītā ne **sabse** teja kāra kharīdī.
Sangītā Erg **all.SE** fast car bought
Sangītā bought the fastest car.

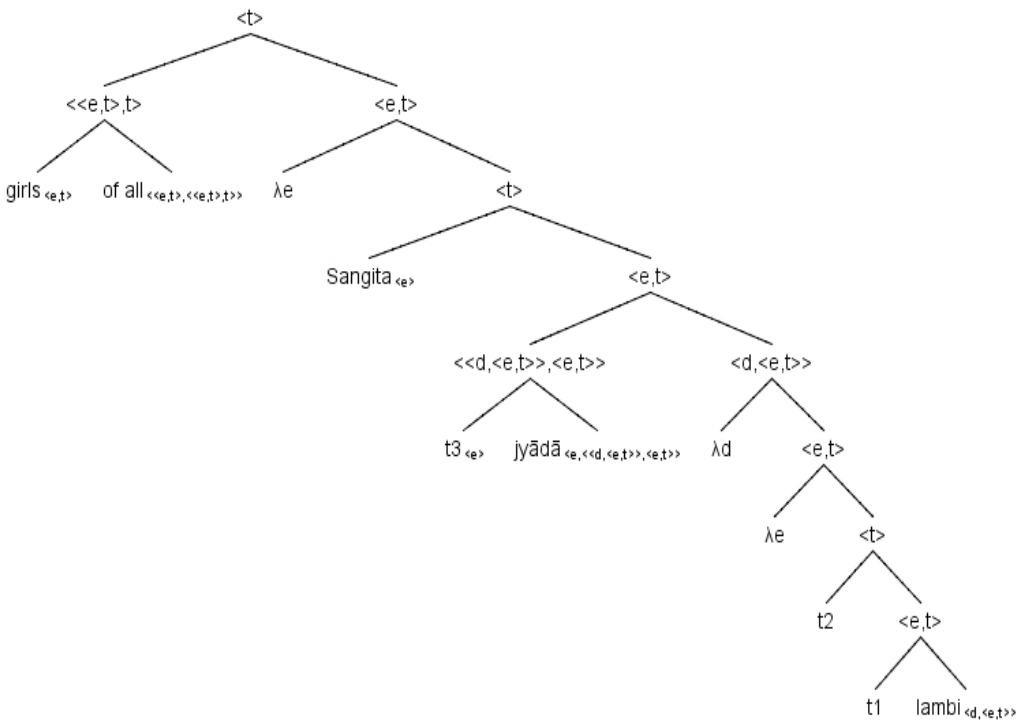
106) Sangītā apnī kakshā **mein** **saba** se lambī chātrā hai.
Sangītā her own class **of** **all** SE tall. Studen is
Sangītā is the tallest student in her class.

Sab (all) is interpreted like quantifier *every*. The lexical entry for *larkiyo (girls)* is assumed without interpreting the plural. The LF of 104) is stated in 108):

107) ⟦sab⟧ = λP. λQ. P⊆Q

108) a.LF [[girls [of all]] [3 [Sangita [t_3 jyādā]
[1 [2 [t_2 [t_1 lambi]]]]]]]

b.



The interpretation of 104) is accordingly:

a. ⟦of all⟧ (⟦girls⟧) (⟦[3 [Sangita [t_3 jyādā] [1 [2 [t_2 [t_1 lambi]]]]]]⟧) = 1 iff

⟦of all⟧ (⟦girls⟧) (λx.[[⟦jyādā⟧ (⟦t_3⟧ $^{g[x/3]}$)])

(⟦[1[2[t_2[t_1 lambi hai]]]]⟧)(Sangita)) = 1 iff

[λP. λQ. P⊆Q] (λx. x are girls) (λx. [max(λd'. Sangita d'-lambi hai > max(λd''. λx. x d''-lambi hai)]) = 1 iff

(λx. x are girls) ⊆(λx. [max(λd'. Sangita d'-lambi hai > max(λd''. λx. x d''-lambi hai)]

'for all x such that x are girls: the maximal height to which Sangita is tall > the maximal height such that x are tall.'

This interpretation of the Hindi superlative is quite handy, because it is possible to interpret the superlative and the comparative using the same structure and lexical entries.

3.5 Subcomparatives

Unlike English, Hindi does not allow subcomparatives. This is not surprising, because there are no clausal comparatives possible, either. Subcomparatives in English or German employ a clausal structure which is not available in Hindi.

109) *Darwaze chaure hai se mez jyādā unchi hai.
Door wide is SE table more high is
The table is higher than the door is wide.

As with other clausal comparatives, Hindi uses a correlative structure instead, which gets analyzed in chapter 4.

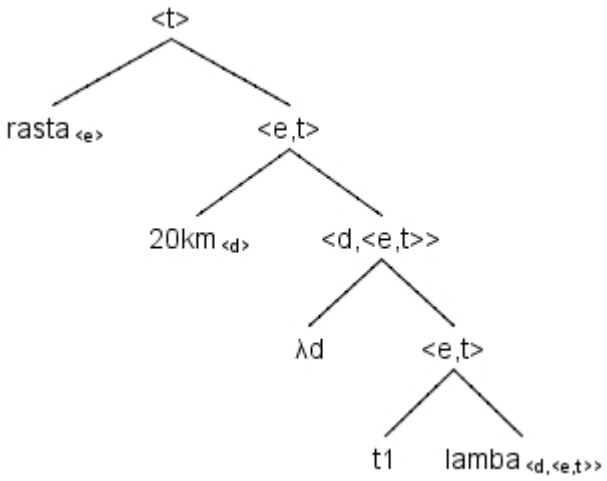
3.6 Measure- phrase constructions

In Hindi, it is also possible for adjectives to combine dircetly with degree denoting expressions.
Consider the following sentence:

110) Rāstā 20km lambā hai.
The walk 20km long is.
'The walk is 20km long.'

The interpretation and LF are straight forward:

111) a.[Rasta [20 km [1 [t_1 lamba]]]]
b.



c. ⟦ Rasta [20 km [1 [t_1 lamba]$^{g[d/1]}$]]⟧ =1 iff
⟦Rasta [20 km [λd. [lamba] (d)]]⟧ =1 iff
⟦Rasta [20 km [λd.λx. Length (x) ≥d]]⟧ =1 iff
[λd.λx. Length (x) ≥d] (20 km) (Rasta) =1 iff
Length (Rasta)≥ 20 km

In Hindi, it is the same with English: it is not possible to combine degree denoting expressions with all adjectives.

3.7 Differentials

For differentials, it is once more necessary to adapt the meaning of the comparison operator.

Consider the following sentence:

112)	Sangita	Ramesh	se	**2cm**	jyādā	lambi	hai.
	Sangita	Ramesh	SE	**2cm**	more	tall	is
	Sangita is 2 cm taller than Ramesh.						

To capture the meaning of 112), it is required to add an argument slot to the basic meaning of *jyādā*. The simplest way is this:

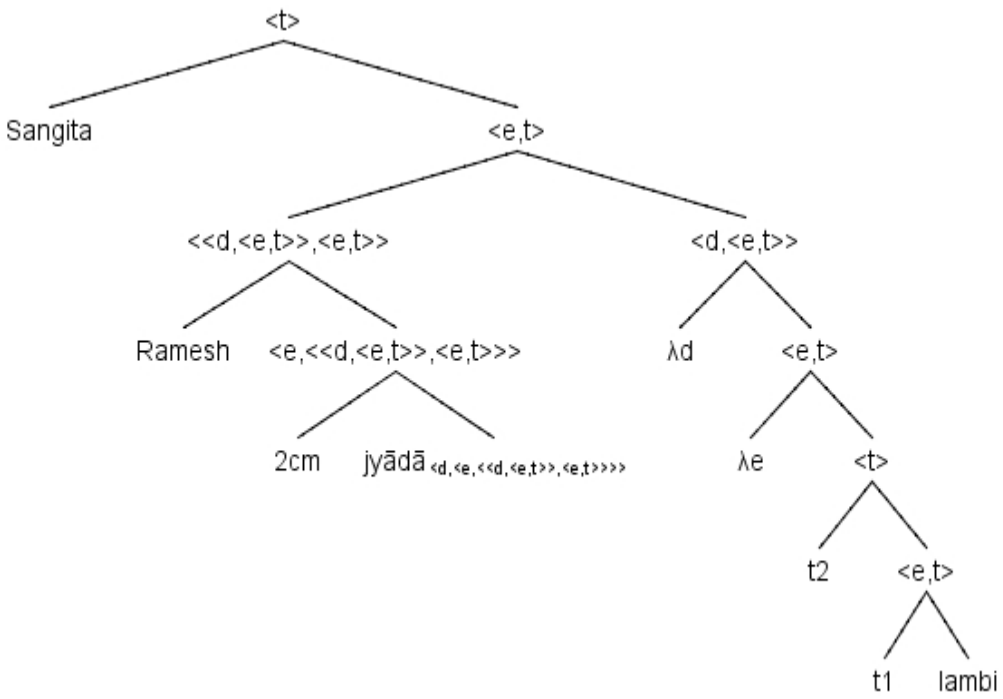
113) $[\![\text{jyādā}_{\text{diff}}]\!]$ = λd.λx.λP.λy. max(λd'P(d')(y))= max(λd"P(d")(x))+ d

Type <d,<e,<<d,<e,t>>,<e,t>>>>

The LF and truth conditions are the following:

114) a.[Sangita [Ramesh [2cm jyādā]] [1[2 [t_2 t_1 lambi hai]]]]

b.



c.[⟦jyādā⟧ (2cm)] (Ramesh) (λd.λx. x d-lambi hai) (Sangita) =1 iff
max(λd'. Sangita d'- lambi hai) = max(λd''. Ramesh d''-lambi hai)
+2cm
The height that Sangita reaches exceeds Ramesh's height by 2 cm.

3.8 Degree questions

Degree questions in Hindi do not exhibit inversion; their structure is as in the example below:

115)	Sangita	kitni	lambi	hai?
	Sangita	how much	tall.fem	is?
	How tall is Sangita?			

An interpretation of degree questions in Hindi has to fulfill two requirements: to be in accordance with standard interpretations of questions and to follow the way other Hindi sentences with a similar structure are interpreted.

In order to interprete degree questions analogue to other Hindi structures, it is reasonable to assume that there is – in the Karttunen(1977) fashion – a Q morpheme and the wh-phrase gets QRed.
Consider the following LF and meanings for the morpheme, the wh-phrase *kitni* and the intensional meaning of the adjective:

116) a. ⟦tall⟧ = λw.λd.λx. Height (w) (x) ≥d

type: <s,<d,<e,t>>>

b. ⟦kitni⟧ = $\lambda P_{<d,<<s,t>,t>>}$. $\lambda p_{<s,t>}$. ∃d[P(d)(p) = 1]

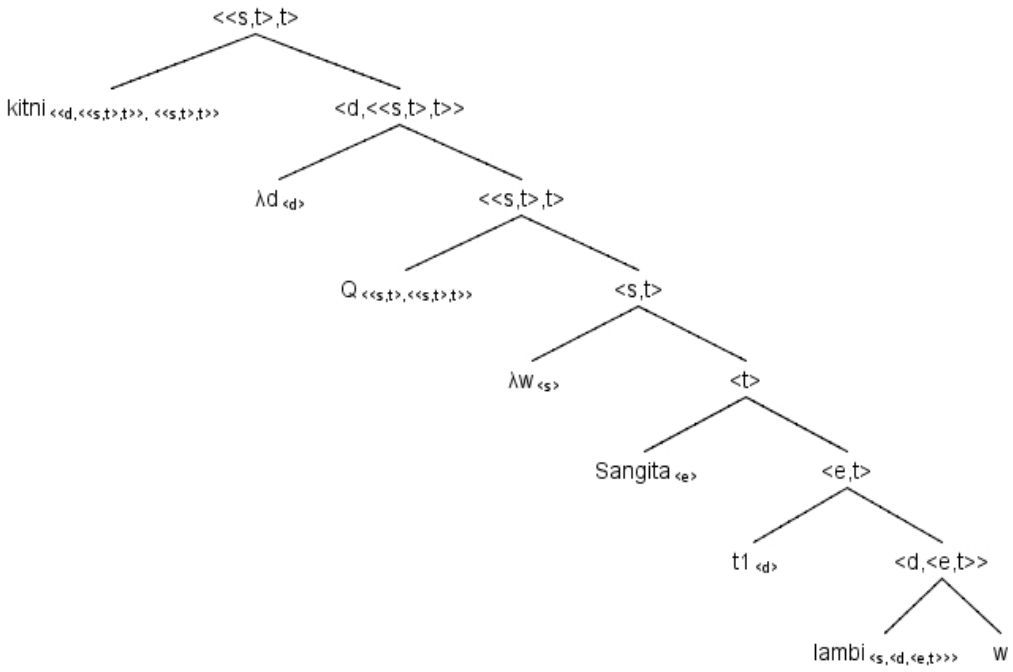
type: <<d,<<s,t>,t>>, <<s,t>,t>>

c. ⟦Q⟧ = $\lambda p_{<s,t>}$. $\lambda q_{<s,t>}$.p= q

type: <<s,t>,<<s,t>,t>>

d. LF: [kitni [λd_1 [Q [λw[Sangita[t_1 [lambi w]]]]]]]

e.



f. ⟦kitni⟧ (⟦1 Q 2 Sangita t_1 lambi w⟧) =1 iff

⟦kitni⟧ (λd. ⟦Q 2 Sangita t_1 lambi w⟧ $^{g[d/1]}$) =1 iff

⟦kitni⟧ (λd. ⟦Q⟧ (λw. ⟦Sangita t_1 lambi w⟧ $^{g[d/1][w/2]}$ =1 iff

⟦kitni⟧ (λd. ⟦Q⟧ (λw. ⟦t_1 lambi w⟧ $^{g[d/1][w/2]}$(Sangita))) =1 iff

⟦kitni⟧ (λd. ⟦Q⟧ (λw. ⟦lambi⟧ (w)(d)(Sangita))) =1 iff

⟦kitni⟧ (λd. ⟦Q⟧ (λw.[λw.λd.λx. Height (w)
(x) ≥d](w)(d) (Sangita))) =1 iff

⟦kitni⟧ (λd. ⟦Q⟧ (λw.Height_w(Sangita) ≥d)) =1 iff

⟦kitni⟧ (λd.[λp. λq.p= q] (λw.Height_w(Sangita) ≥d in w) =1 iff

⟦kitni⟧ (λd.λq.q=λw. Height(Sangita) ≥d in w) =1 iff

[λP. λp. ∃d'[P(d')(p) = 1]
(λd.λq.q=λw. Height(Sangita) ≥ d in w) =1 iff
λp.∃d'[p= λw. Height(Sangita) ≥ d' in w]

This approach to Hindi questions is the classical Karttunen approach without having to make the slightest changes to it.

3.9 Concerning the Parameters of B17

B17 has investigated how those languages under investigation differ in respect to comparisons. Three different parameters were determined.
The first one was wether the language makes use of degree semantics:

117) DEGREE SEMANTICS PARAMETER (DSP):
A language {does/does not} have gradable predicates (type <d,<e,t>> and related), i.e. lexical items that introduce degree arguments.[24]

In order to derive whether a language has the positive or the negative setting, two questions have to be answered, namely

i. "whether the language has a family of expressions that plausibly manipulate degree arguments: comparative, superlative, equative morphemes, items parallel to *too, enough* and *so that*.
ii. whether the language has expressions that plausibly refer to degrees and combine with degree operators: comparison with a degree (CompDeg) like 79), difference comparative (DiffC) like 112)."[25]

[24] Following Beck(to appear)
[25] Ebd. (p. 53)

Hindi has the positive setting [+DSP]. Considering i, Hindi indeed has comparative and equative morphemes – the superlative is built by combining a comperative morpheme with a reference group - but it does not have items parallel to *too* and *enough*. Consider:

118) Sangeeta sofe par sone ke_liye bahut barñi hai
Sangeeta sofa on sleepto very big is
Sangeeta is too big to sleep on the sofa.
'Sangita is very big to sleep on the sofa.'

119) Sangita is per par charne ke_liye bahut barñi hai
Sangita this tree on climb to very big is
Sangeeta is tall enough to climb on this tree.
'Sangita is very tall to climb on this tree.'

As could be seen in 118) & 119), Hindi has no lexical inventory to express *too* or *enough*, but is nonetheless able to express a meaning similar to that. But this is of course no evidence against Hindi being [+DSP].

The second parameter is to ask whether the language in question does permit quantification over degree arguments:

120) DEGREE ABSTRACTION PARAMETER (DAP)
((Beck, Oda, & Sugisaki, 2004):
A language {does/does not} have binding of degree variables in the syntax.

For a language being [+DAP], it must have the following properties: wide scope of degree operators, negative islands, degree questions, subcomparatives and measure phrases.
For Hindi, the picture is not clear. Consider:

121) Sangita kitni lambi hai?
Sangita how much tall.fem is?

How tall is Sangita?

122) *Darwāzā chaūṛā hai se meja jyādā ūnchī hai.
Door wide is SE table more high.fem is
The table is higher than the door is wide.

123) Rāstā 20km lambā hai.
The walk 20km long is.
'The walk is 20km long.'

As can be seen in 121), DEGQ are possible in Hindi, as well as MP in 123). Negative Islands (NEGIS) cannot be attested for, because of the lack of clausal comparatives. Consequently, scopa data become significant.
Scopal interaction was an important part of the questionnaire for SFB 441 project B17. Consider the following sentences and the contexts in which they where presented to the informants:

The third parameter concerns measure phrases:

124) DEGREE PHRASE PARAMETER (DEGPP):
The degree argument position of an unmarked gradable predicate {may/may not} be occupied by a syntactically visible element at a pre-LF level of syntax.

As Beck (to appear) already mentioned, Hindi is [+DEGPP]. Let's see why:
A language can only be [+DEGPP] if it is also [+DAP] which is true for Hindi. The question, whether a language can have subcomparatives, measure phrases and degree questions has to be answered positively. In the case of Hindi, the picture is not clear on first sight, because of the lack of subcomparatives. But this is only due to the fact that Hindi does not have *than*-clauses. The other two conditions for [+DEGPP] are fulfilled in Hindi). It is indeed possible to have measure phrases as well as degree phrases in Hindi(c.f. 125)& 126).

Consider:

125) Rāstā 20km lambā hai.
The walk 20km long is.
'The walk is 20km long.'

126) Sangita kitni lambi hai?
Sangita how much tall.fem is?
How tall is Sangita?

Therefore, Hindi belongs to the group of languages which are [+DEGPP].

3.10 Conclusion

In this chapter, an interpretation for Hindi comparison constructions was presented. As we have seen, it was possible to interpret all Hindi comparison constructions in a fashion similar to English apart from those where a correlative structure is needed. They will be discussed independently in Chapter 4.

In a final step, the parameters proposed by B17 where surveyed in order to check, whether they apply to Hindi or not. As we could see, they all do.

Chapter 4. CORRELATIVES

4.1 Correlatives

The alternative structure to express clausal comparatives in Hindi are degree correlatives which will be discussed in this chapter. This expression covers two phenomena: the comparative and the equative correlative.

First, correlatives are distinguished from other relativization strategies in Hindi. Then their appearance in connection with comparatives is presented in order to be able to present an analysis of comparative correlatives. In order to do that, Bhatt & Takahashi's (2007) suggestion to use a 2-place comparative operator is discussed and my own suggestion for degree correlatives is presented. Furthermore, the explicit distinction between comparative and equative correlatives in Hindi will be presented.

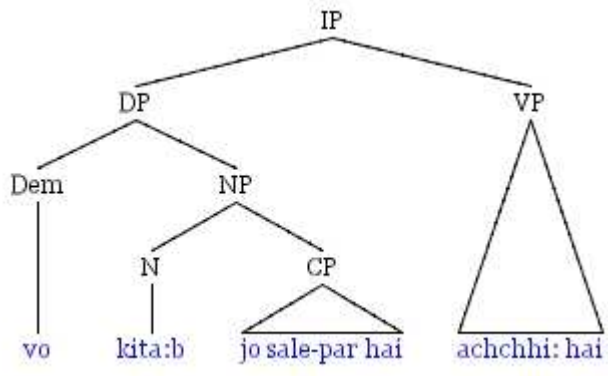
4.1.1Relativization Strategies in Hindi

According to Bhatt (2003)[26], there are several relativization strategies in Indo-Aryan languages in general, namely English-Type Relative Clauses, Non-finite Relative Clauses and Correlatives.

English-type relatives have the following structure:

127)	a.Vo	kita:b	jo	sale-par	hai	achhi:	hai
	Dem	book	rel	sale-on	is	good	is

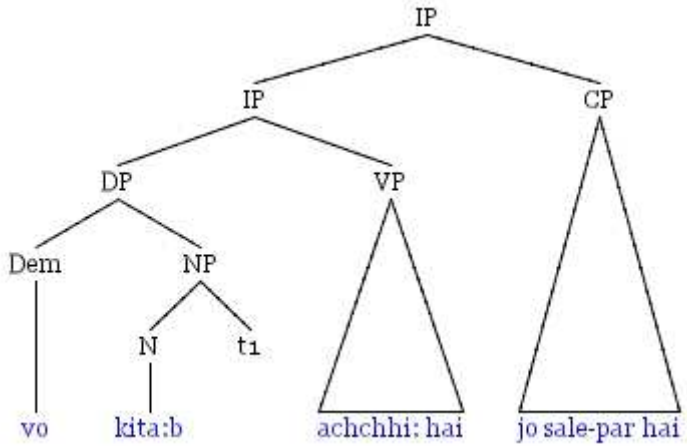
b.



English-type Relative Clauses are always postnominal; they can be extraposed to the right:

c.

[26] The example and the reasoning are taken from Bhatt (2003)in this subchapter. The glosses are adapted to my glossing standards.



Non-Finite Relative Clauses, on the other hand, are always prenominal. They are either based on a participle – perfective or impferctive - or an adjectival form.

128) Prenominal non-finite Relative Clause

a. Perfective participial

mẼ-ne [vo [$_{RelCl}$ pi:la: paṛ gāyā:] phu:l] utha: liya:
I-Erg [Dem yellow fall GO-Pfv flower lift TAKE-Pfv
I picked up the flower that had become yellow (from Kachru 1973)

b. Imperfective participal

[[$_{RelCl}$ chal-ti:] ga:ri:]-se mat utro
Move-Impfv.F vehicle.F-from Neg descend-Imp
Do not descend from the moving vehicle. (from Hook 1979)

c. Adjectival

mẼ kal [[$_{RelCl}$ Ram-ko darshan paṛha:-ne
I yesterday Ram-Acc philosophy tech-Ger.Obl

va:le addhya:pak]-se mil-a:
Adj.Obl teacher-with meet-Pfv
I met the teacher who teaches Ram philosophy yesterday.

It is peculiar to non-finite relative clauses that only the (highest) subject position can be relativized.

The third relativization strategy are correlatives, or in this case degree correlatives which will be discussed in the next subsection.

But it would be a shameful neglect not mention what Bhatt (2008, p. 6) calls "the world's most famous correlative" (introduced by Srivastav (1991)):

129) [jo laṛkii khaṛii hai], [vo lambii hai]
Rel girl standing is Dem tall is
'The girl who is standing is tall.' (Lit. which girl is standing, she is tall)

This is a single-head correlative, that means that there is one REL-XP in the correlative clause. Multi-head correlatives are also possible; then there are more than one REL-XP in the correlative clause:

130) [jis-ne$_i$ jo$_j$ kar-na: cha:h-a]$_{i,j}$ [us-ne$_i$ vo$_j$ ki-ya:]
[Rel-Erg Rel do-Ger want-Pfv Dem-Erg Dem do-Pfv]
For x,y, s.t. x wanted to do y, x did y.
(Lit. 'who wanted to do what, he/she dit that.')[27]

There is the requirement that for each REL-XP in the correlative clause there must be a DEM-XP in the matrix clause.

4.2 Degree Correlatives

Correlatives are one of the three relativisation strategies in Hindi. They are needed as an alternative strategy to express clausal comparatives[28]. They can have the following structure:

131) a.[$_{IP}$[$_{CorCP}$ ...Rel XP$_i$...]$_i$ [$_{IP}$... Dem-XP$_i$...]][29] (=(131)

[27] (Bhatt, Locality in Correlatives, 2003, p. 492)
[28] In Hindi, correlatives are also used to realize conditionals, *when*-clauses and *until*-clauses (c.f. Bhatt (2006)).
[29] C.f. Bhatt (2003, p. 490). This structure describes what Dayal (1995) calls left-adjoined correlatives which are, according to her, the "real" correlatives. Although Bhatt (2003)

b[Rameshaa ne **jitanā** jora-se sītī-bajāyī]
Ramesha Erg as much loudly whistle
(=Rel)
Sangītā ne **utnī** ūnchā gāyā.
Sangītā Erg **so much** loud.masc sang
(=Dem)
'Ramesha's whistling was as loud as Sangītā's singing was loud.'
Sangītā sang as loud as Ramesha whistled.

c.[Bill **jitna** lambaa hai][30].
Bill as much tall is
(=Rel).**masc**

John **us-se** **zyaadaa** lambaa hai.
John **that-than** more tall is
(=Dem)

John is taller than Bill is.

Degree correlatives can be realized in two different ways, namely as *equative correlative* 131)b and the *comparative correlative* 131)c.

132)

Construction	**Relative Phrase**			**Proform**	
Comparative	[*jitna*	...	[*us-se jyada*	...
	... *how-much*	]	... *that-than more*	]
Equative	[*jitna*	...	[*utnaa*	...
	... *how-much*	]	... *that-much*	]

Abbildung 1 Surface Variation of Comparative Correlatives[31]

proves that embedded correlatives have to be interpreted similar to left-adjoined correlatives – a fact, Dayal claims to be different - he nonetheless sticks to Dayal's original distinction in his sample sentences.

[30] This example is taken from (Bhatt & Takahashi, 2007, p. Footnote 2) & (Bhatt & Takahashi, 2008) The gloss is slightly adjusted in order to be analoguous to the other examples of this work.

[31] Adapted from (Bhatt, 2006)

As can be seen in 132), the two degree correlatives differ in the proform of the matrix clause; the relative phrase in the correlative sentence is in both cases identical.

It should be easy, then, to change a comparative correlative to an equative correlative simply by changing the proform in the matrix sentence.

In order to test this prediction an informant was asked the following questions.

Consider:

133) a.[Rameshaa ne **jitanā** jora-se sītī-bajāyī]
Ramesha Erg as much loudly whistle
(=Rel)
Sangītā ne **utnī** ūnchā gāyā.
Sangītā Erg **so much** loud.masc sang
(=Dem)
'Ramesha's whistling was as loud as Sangītā's singing was loud.'
Sangītā sang as loud as Ramesha whistled.

b.[Rameshaane **jitanā** jora-se sītī-bajāyī]
Ramesh Erg as much loudly whistle
Sangītā ne **usse** jyada ūnchā gāyā.
Sangita Erg **that-than** more loudly sings
Does this sentence mean:
Sangita sings louder than Ramesh whistles?
Yes X No

Changing the meaning from an equative meaning to a comparative meaning is indeed possible, but the judgement of the sentences switching from comparative to equative meaning is not possible without adding *bhi*.

134) a. [Bill **jitna** lambaa hai][32].

[32] This example is taken from (Bhatt & Takahashi, 2007, p. Footnote 2) & (Bhatt & Takahashi, 2008) The gloss is slightly adjusted in order to be analoguous to the other examples of this work.

Bill as much tall is
(=Rel).**masc**
John **us-se** zyaadaa lambaa hai[33].
John **that-than** more tall is
(=Dem)
John is taller than Bill is

b**?**Billjitanā lambaa haiJohn utna lambaa hai.
Bill as much tall is John that much tall is
Does this sentence mean:
John is as tall as Bill is?
Yes X, but it sounds strange No

135) Bill jitna lambaa hai John **bhi** utna lambaa hai.
Bill as much tall.masc is John also? so much tall is
John is as tall as Bill is.

It is peculiar, that sentence 134) is only good in combination with *bhi* in 135*)*. It is not clear, what the contribution of *bhi* to the sentence exactly is. Hindi *bhi* can have two different meanings, namely the focus particle meaning *even* or *also*. The informant proposed that the meaning is *also* which would mean that a paraphrase of 134) could be the following:

136) As much tall Bill is, John is also so much tall.

Equatives show another peculiar behaviour. Both 137) & 138) can be interpreted as having a similar meaning, but 137) is according to 132) an equative correlative and 138) is also an equative correlative combined with *jyada*, usually the comparative operator in Hindi:[34]

[34] Examples are taken from Bhatt (2008)

137) Jitnii der hotii gayii **utnii** ṭhanḍ baṛhi gayii.

How much late was went that much cold increase went

'the later it got, the colder it became.'

(Lit: as much late it got, that much colder it became)

138) Jitni jyada der hotii gayii

As much more later was went

utnii jyada ṭhanḍbaṛhtii gayii.

that much more cold increased went

'The later it got, the colder it became.'

(Lit: as much later it got, that much more cold it became)

Bhatt (2008) explains this behaviour with the fact "that zyaadaa does not always indicate comparison. It can also provide an intensifiying meaning, functioning as a degree modifier with the meaning a lot."[35] This is compatible with the findings of chapter 3. He comes thus to the conclusion that sentences like 138) can be analyzed as plain equative correlative and that a comparative analysis for those sentences is less easily accessible.

4.3 Interpretation of Degree Correlatives

One possibility to interpret degree correlatives is to make use of Bhatt & Takahashi's (2007)(2008) suggestion, namely to use the 2-place operator usually employed to interpret English comparative clauses.

For the lexical entry of the 2-place operator two different versions are necessary - one for the equative correlative 131)b and the other for the comparative correlative 131)c. Assuming that, the interpretation and implementation looks like this:

139) a. $[\![er_{clausal}]\!] = \lambda D_{1<d,t>}.\lambda D_{2<d,t>}.\ max(D_2) > max(D_1)$

[35] Bhatt (2008, pp. 5, footnote 2)

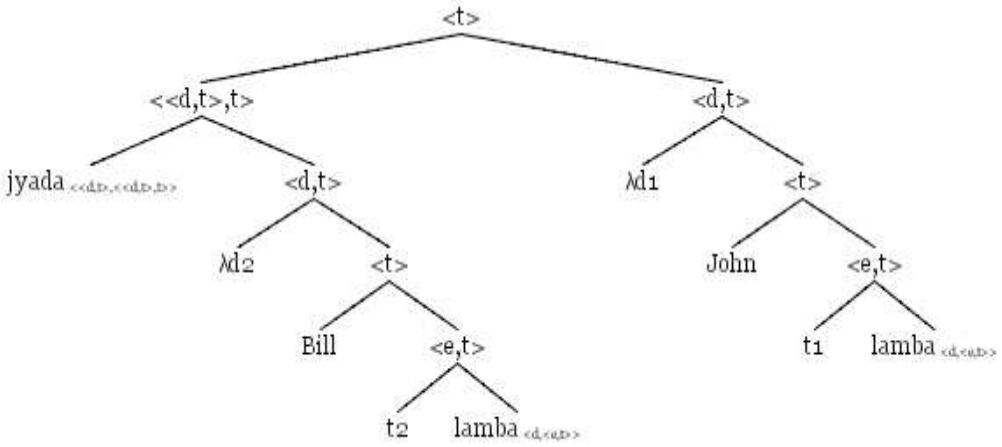
b. ⟦equative$_{clausal}$⟧ = $\lambda D_1.\lambda D_2.\ max(D_2) \geq max(D_1)$

both being of type < <d,t>,<<d,t>,t>

This yields the following LF for sentence 131)c:

140) a. [[jyada [2[Bill[t_2-lamba]]]][1[John[t_1-lamba]]]]

b.



c. ⟦jyada[2 Bill t_2-tall][1 John t_1- tall]⟧ =1 iff

⟦jyada⟧ (⟦2 Bill t_2- tall⟧) (⟦1 John t_1- tall⟧) =1 iff

⟦jyada⟧ (λd.[⟦Bill t_2- tall⟧ $^{g[d/2]}$])

(λd. [⟦John t_1- tall⟧ $^{g[d/1]}$]) =1 iff

⟦jyada⟧ (λd. [⟦t_2- tall⟧ $^{g[d/2]}$(Bill)])

(λd. [⟦t_1- tall⟧ $^{g[d/1]}$ (John)] =1 iff

⟦jyada⟧ (λd.[⟦tall⟧ (⟦t_2⟧)$^{g[d/2]}$(Bill)]) (λd.[⟦tall⟧

(⟦t_1⟧ $^{g[d/1]}$) (John)]) =1 iff

⟦jyada⟧ (λd. [⟦tall⟧ (d) (Bill)])

(λd. [⟦tall⟧ (d) (John)]) =1 iff

⟦jyada⟧ (λd. [λd.λx. x d- tall] (d) (Bill))

(λd. [λd.λx. x d- tall] (d) (John)) =1 iff

⟦jyada⟧ (λd. Bill d- tall) (λd. John d- tall) =1 iff

[$\lambda D_1.\lambda D_2.\ max(D_2) > max(D_1)$]

(λd. Bill d- tall) (λd. John d- tall) =1 iff

max(λd. John d- tall) > max (λd. Bill d- tall)

'the maximal degree to which John is tall > the maximal degree to which Bill is tall.'

This is undoubtly a possible interpretation of Hindi equative or comparative correlatives. But as it is similar to the interpretation of English clausal comparatives, it would clearly be preferable to analyze the degree correlative sentences analoguous to other Hindi comparative phenomena, namely with the 3-place comparison operator.

Going back to (Srivastav, 1991) it is generally assumed that the demonstrative of the matrix clause is semantically empty and that the relative of the correlative clause is an operator.

In comparative/equative correlative sentences, the relevant operator has to incorporate one feature, namely the maximality operator.

Compare the two variants of the lexical entry for jyada:

141) a $[\![\text{jyada}_{\text{corr}}]\!] = \boldsymbol{\lambda d_{<d,t>}}.\lambda P_{<d,<e,t>>}.\lambda x_{<e>}.$ max(λd'.(P(d')(x))) > **max (D)**

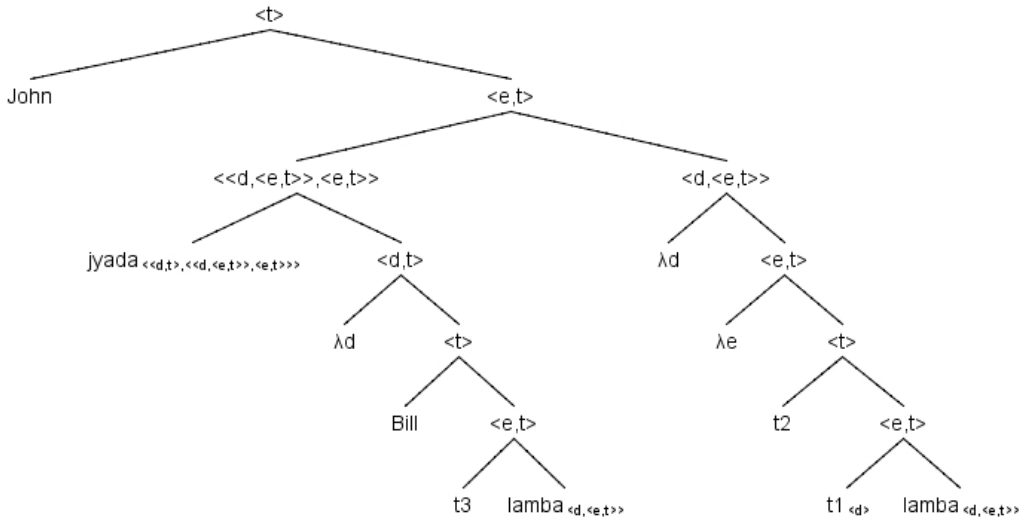
of type <<d,t>,<<d,<e,t>>,<e,t>>>

b $[\![\text{jyādā}_{\text{degree}}]\!] = \boldsymbol{\lambda d_{<d>}}.\lambda P_{<d,<e,t>>}.\lambda x_{<e>}.$ max (λd'. P(d')(x)) ≥ **d**

of type <d, <<d,<e,t>>,<e,t>>>

Here's the proposal for the LF of 131):

c



And the calculation of the truth conditions:

[John [[jyada[3[Bill[t_3- tall]]]] [1[2[t_2[t_1- tall]]]]]]

⟦John jyada 3 Bill t_3- tall 1 2 t_2 t_1- tall⟧ =1 iff

⟦jyada 3 Bill t_3- tall 1 2 t_2 t_1- tall⟧ (John) =1 iff

⟦jyada⟧ (⟦3 Bill t_3- tall⟧) (⟦1 2 t_2 t_1- tall⟧) (John) =1 iff

⟦jyada⟧ (λd. ⟦Bill t_3- tall⟧ $^{g[d/3]}$)

(λd.λx. ⟦t_2 t_1- tall⟧ $^{g[d/1][x/2]}$)(John) =1 iff

⟦jyada⟧ (λd. ⟦t_3- tall⟧ $^{g[d/3]}$ (Bill)) (λd.λx. ⟦t_1- tall⟧ $^{g[d/1]}$

(⟦t_2⟧ $^{g[x/2]}$)) (John) =1 iff

⟦jyada⟧ (λd. ⟦tall⟧ (⟦t_3⟧ $^{g[d/3]}$) (Bill)) (λd.λx. ⟦tall⟧

(⟦t_1⟧ $^{g[d/1]}$) (⟦t_2⟧ $^{g[x/2]}$)) (John) =1 iff

⟦jyada⟧ (λd. ⟦tall⟧ (d)(Bill)) (λd.λx. ⟦tall⟧ (d)(x))(John) =1 iff

⟦jyada⟧ (λd. [λd.λx. x d- tall] (d) (Bill))

(λd.λx. [λd.λx. x d- tall] (d) (x)) (John) =1 iff

⟦jyada⟧ (λd. Bill d- tall) (λd.λx. x d- tall) (John) =1 iff

[$\lambda D_{<d,t>}.\lambda P_{<d,<e,t>>}.\lambda x_{<e>}$. max(λd'.(P(d') (x))) > max (D)]

(λd. Bill d- tall) (λd.λx. x d- tall) (John) =1 iff

max(λd'. [λd.λx. x d-lamba](d') (John)) >

max (λd. Bill d- tall) =1 iff

max(λd'. John d'-tall) > max (λd. Bill d- tall)

'the maximal degree to which John is tall > the maximal degree to which Bill is tall.'

This interpretation is as straight-forward as Bhatt & Takahashi's (2007) & (2008) suggestion with the advantage that it is possible to stay within the given framework for Hindi comparative constructions.
The derivation and interpretaion of equative correlatives is assumed to be completely analoguous. Only variation in the lexical entry for *jitni* – and nothing else – is necessary:

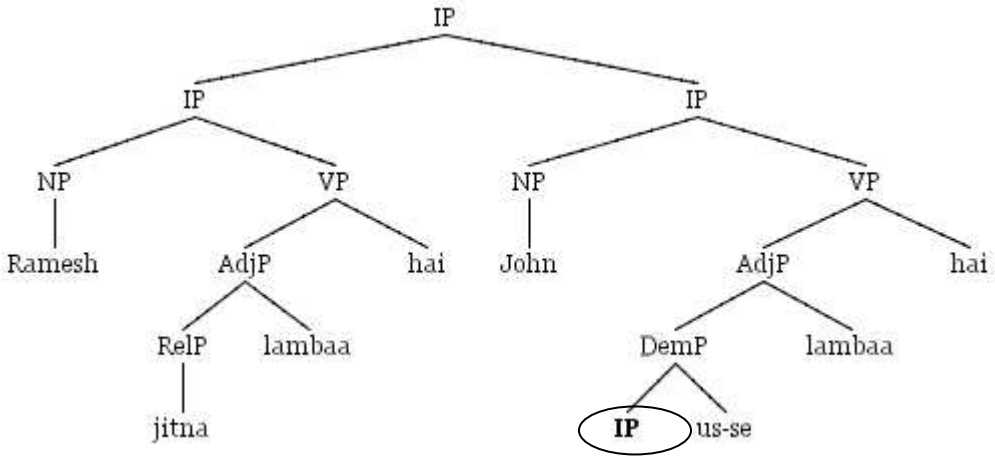
142) ⟦jitnī/ā⟧ = $\lambda d_{<d,t>}.\lambda P_{<d,<e,t>}.\lambda x.$ max ($\lambda d'.$(P(d')(x))) ≥ max(D)

This analysis allows to keep the framework of other comparative phenomena without making too many allowances.
Both degree correlatives are left-adjoined correlatives in this case. That means for this work, that it is assumed that the correlative sentences are moved from their origin adjoined to the DemXP of the matrix clause.
In order to maintain the claim that Hindi comparative correlatives are interpreted analoguous to other Hindi comparatives, a closer look at the structure of correlatives is in order. The LF of 127) seems to have no connection to the surface of the sentences. For this reason, the deep structure becomes relevant. Remember the LF of :

143) LF: [John[jyada[3[Bill[t_3 lamba]]]][2[1[t_2[t_1 lamba]]]]]

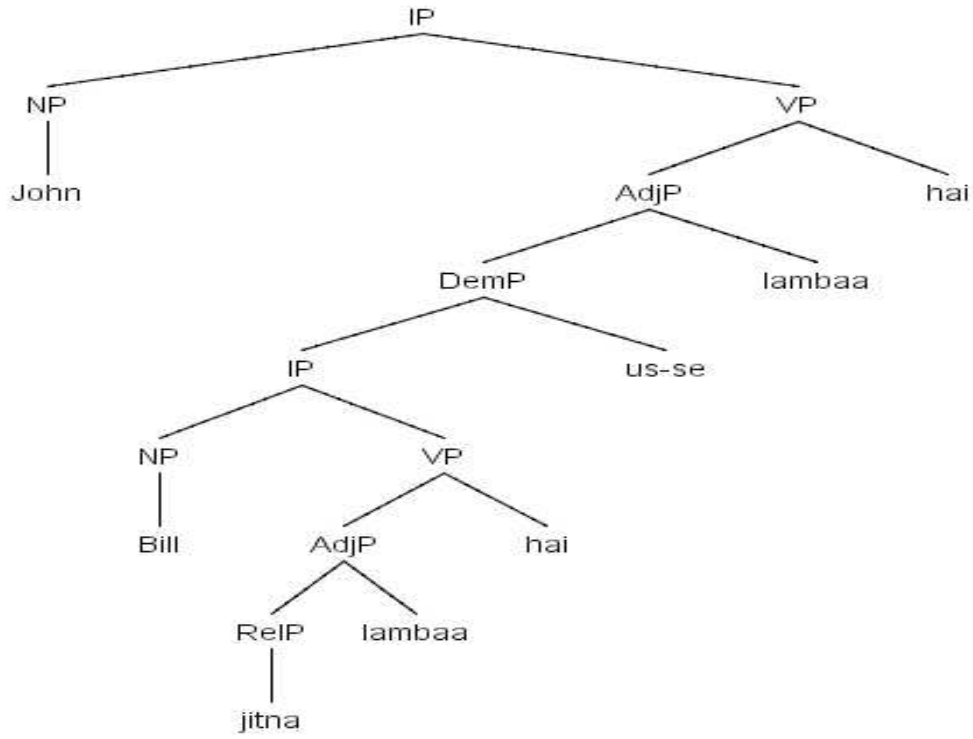
Similar to Bhatt (2003), the correlative sentence is interpreted as adjoined to IP at the level of surface structure:

144) Surface Structure



As is indicated in the tree, the correlative sentence originates adjoined to DemP and can be moved to an IP adjoined position. As far as comparative correlatives are concerned, it does not matter whether the correlative sentence is right-adjoined or left-adjoined. This is contrary to (Dayal, 1995) who claimes that proper correlatives are only those who are left-adjoined. They are interpreted as being base-generated there.

Consider the deep structure of 131)c:



(Bhatt, 2003) on the other hand makes similar assumptions as the interpretation introduced above. The correlative sentence is base-

generated adjoined to DemP and can optionally be moved to an IP-adjoined position.

4.4 Conclusion

In this chapter, degree correlatives as one possible relativization strategy were looked at closely. The suggestion for interpreting degree correlatives fits smoothly in the established framework of chapter 3.

Chapter 5. Results & Preview

5.1 Results

COMPARISON CONSTRUCTIONS IN HINDI was written in the course of project B17. The goal of this work was to find out, whether there are comparable data to English in Hindi concerning comparison constructions. Building on that, semantical interpretations for those constructions were presented.
English comparison constructions were taken as a starting point. In chapter 2, the major phenomena were presented with a short semantical analysis. The interpretation was adopted from Beck (to appear)which was also used commonly in B17. In order to be able to compare Hindi and English comparison constructions, Bhatt & Takahashi's (2007) discussion of the analysis for those languages was presented.
In chapter 3, the analogous Hindi comparison constructions were presented. Evidently, with Heim's (1985)comparative operator it is possible to interpret all the relevant constructions which is in line with Bhatt & Takahashi.
In chapter 4, Hindi degree correlatives were discussed. Correlatives are one of three relativization strategies in Hindi. They can express different meanings, namely conditionals, comparatives (=degree correlatives), when-clauses and until clauses. In this work, focus was put on degree correlatives.

5.2 Outlook

This work was a first step to interpret and understand Hindi comparison constrctions. Now, three different paths for further research are feasible.
The first path directs to the work of the other members of project B17 and their work. It would be interesting to know, for example, whether evaluativity plays a role for Hindi ajdectives (as Krasikova (accepted) is concerned with). Another task is to answer the question why Hindi reverts to correlatives in order to express clausal comparatives.
The second path leads to the follow-up project of B17, namely C1, of the new SFB 833 BEDEUTUNGSKONSTITUTION: DYNAMIK UND understanding of e.g. measure phrases, equatives, morphological and syntactical negation of

each language surveyed. Hindi, of course, has to be considered as well. More detailed data has to be elicited and evaluated.

The third path heads towards scope interactions between the comparative operator and modals or quantifiers in Hindi. In this work, scope interactions were considered only briefly. But with regard to C1 it is important to examine Hindi scope interactions more thoroughly in order to help verify (or falsify, of course) the status of the comparative as quantificational element.

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