# Direct Comparisons: Resurrecting the Direct Analysis of Phrasal Comparatives

Rajesh Bhatt[1] and Shoichi Takahashi[2]
[1,2]*University of Massachusetts, Amherst and* [2]*University of Tokyo*

## 1. Introduction

There have been two major strands in the analysis of phrasal comparatives: Reduction Analyses that relate the *than*-phrase to a degree description denoting clause and Direct Analyses that interpret the *than*-phrase directly. Reduction Analyses assume that the *than*-phrase is part of a larger clausal constituent to which reduction operations have applied. Direct Analyses, on the other hand, need to assume a new lexical entry for the degree head. In recent work, Lechner (2001, 2004) has argued against the availability of a Direct Analysis for English and German. We show that while Lechner is correct about his conclusions for English and German, Hindi-Urdu phrasal comparatives require a Direct Analysis. This means that both Reduction and Direct Analyses are options permitted by universal grammar. We show that the availability of one of the options in a particular language can be correlated to independent properties of the language in question.

## 2. The Inventory of Lexical Items

It has been observed that a wide range of syntactic constituents can appear in the complement of *than*. The complements of *than* can denote a range of meanings. Since the *than*-phrase is a semantic argument of the degree operator, this has implications for the semantics of the degree operator *-er*. How many meanings do we need for *-er*? How many distinct meanings are attested crosslinguistically?

### *2.1. 2-place -er and Clausal Comparatives*

To address this issue, let us first consider comparatives like (1) in which a degree description appears in the complement of *than*.

(1) a. John is taller than six feet.

We would like to thank audiences at the UMass Syntax Reading Group, Ohio State University, GLOW XXX at CASTL Tromsø, McGill University, and SALT 17 at UConn for comments and suggestions. In particular, we would like to thank Jeremy Hartman, Kyle Johnson, Winfried Lechner, Roumi Pancheva, Carl Pollard, Bernhard Schwarz, and Lisa Travis. The second author is supported by the Research Fellowship of the Japan Society for the Promotion of Science for Young Scientists under Grant No. 9919.

b. Hindi-Urdu:

Atif-ne tiin-se zyaadaa kitaabẽ khariid-ii thĩ:
Atif-Erg three-than more books.f buy-Pfv.f be.Pst.FPl

'Atif bought more than three books.'

We can handle (1) by assigning *-er* the semantics in (2). According to this lexical entry, *-er* combines with two degree predicates. Therefore we will refer to this lexical entry as 2-place *-er*.

(2) $[\![ \text{-er} ]\!] = \lambda P_{dt}.\lambda Q_{dt}.\exists d[Q(d) \wedge \neg P(d)]$

Assuming that gradable adjectives, such as *tall*, denote a function of type $\langle d, \langle e, t \rangle \rangle$, as in (3), a syntactic constituent that functions as the second argument of the 2-place *-er* is created by Quantifier Raising (QR) of *-er*, as illustrated in (4).

(3) $[\![ \text{tall} ]\!] = \lambda d.\lambda x.$ [$x$ is $d$-tall]

(4) [[-er [than 6 feet]] [$\lambda d.$ [John is $d$-tall]]]

In addition to degree descriptions, *than* can also take a clausal structure, as in (5a) (clausal comparatives).[1] It would be desirable if we could handle clausal comparatives with the independently needed 2-place *-er*. Indeed, it is widely considered that this is possible. We can assume that the complement of *than* in clausal comparatives also denotes a predicate of degrees, given several well-motivated assumptions: a *than*-phrase involves a gradable predicate, which is deleted under identity with one in the matrix clause, and the degree argument of the silent gradable predicate is abstracted over, due to operator movement.

(5) a. John is taller than [Bill is].

b. [[-er [than [OP $\lambda d_1$. [Bill is ~~$d_1$-tall~~]]]] [$\lambda d_2$. [John is $d_2$-tall]]]

We have seen that the 2-place *-er* allows itself to combine with two types of syntactic constituents, both of which denote a predicate of degrees. However, we have not shown that the 2-place *-er* is sufficient to account for other kinds of comparatives. In the next section, we discuss another kind of comparative which suggests that we might need another lexical entry for the degree operator.

### *2.2. 3-place -er and Phrasal Comparatives*

Phrasal comparatives, exemplified in (6), raise an interesting question for the semantics of the degree operator because only an individual type element is present

[1] In Hindi-Urdu, a clausal structure cannot appear in the complement of *-se* 'than' for a reason to which we will return. Instead, correlatives must be used to express clausal comparatives, as in (i).

(i) [Bill jitnaa lambaa hai] [John us-se zyaadaa lambaa hai]
Bill how tall is John that-than more tall is

'John is taller than Bill is.'

in the complement of *than*. Moreoever there is no clear evidence for the presence of a clausal structure there. Consequently, on the surface, the degree operator does not combine with a predicate of degrees in phrasal comparatives.

(6) a. John is taller than Bill.

b. John Bill-se zyaadaa lambaa hai
John Bill-than more tall is
'John is taller than Bill.'

However, it is certainly possible to pursue the hypothesis that the 2-place *-er* is also at work in phrasal comparatives. Under this approach, a silent clausal structure must be posited in the complement of *than*, just like in clausal comparatives, and a bigger constituent is assumed to be deleted in phrasal comparatives than in clausal ones (Reduction Analyses, see Lechner 2001, 2004, Merchant 2007, and Pancheva 2006, 2007 among others). One advantage of Reduction Analyses is obvious: we can maintain the simplest lexical inventory in which there is only one lexical entry for the degree operator.

(7) [[-er [than [OP $\lambda d_1$. [Bill ~~is $d_1$-tall~~]]]] [$\lambda d_2$. [John is $d_2$-tall]]]

However, there is another approach to phrasal comparatives, which does not posit any silent structure, but postulates another lexical entry for the degree operator. Under this view, the degree operator can directly take an argument of type e (Direct Analyses, see Heim 1985 for detailed discussion). One lexical entry of *-er* that makes this possible is provided in (8), in which it needs to take two individuals and one predicate of individuals and degrees as its arguments (the 3-place *-er*).

(8) $[\![ \text{-er} ]\!] = \lambda x.\lambda P_{det}.\lambda y.\exists d[P(y,d) \wedge \neg P(x,d)]$

The predicate of individuals and degrees is created by movement of the associate and the degree operator, as illustrated in (9).[2, 3]

(9) a. John is taller than Bill.
[John [[-er [than Bill]] [$\lambda d.\lambda x.$ [$x$ is $d$-tall]]]]

b. More students read LGB than the MP.
[LGB [[-er [than the MP]] [$\lambda d.\lambda x.$ [$d$-many students read $x$]]]]

We have seen that the 2-place *-er* must be assumed independently of phrasal comparatives. Combined with an ellipsis operation, it can successfully deal with

[2]We assume that the degree operator undergoes QR, "tucking-in" beneath the moved associate (Richards 1997). Locality constraints apply to the (covert) movement of the associate as noted in Heim (1985). Relevant examples are **I spent more time with a woman who played the clarinet than the lute* (from Heim 1985) and **More people live in the country that Bush governs than Putin* (from Merchant 2007). Reduction Analyses are also able to handle these facts.

[3]The effect of syntactic ellipsis in Reduction Analyses is obtained in the Direct Analysis by making use of a predicate of individuals and degrees twice in semantics. Thus, the Direct Analysis can be regarded as a semantic ellipsis approach. See Heim (2000) for further discussion.

phrasal comparatives. Is there any evidence which requires the 3-place *-er*, as well? Lechner (2001, 2004) argues that there is no such evidence at least in English (and German). In fact, Lechner makes a stronger claim that the Direct Analysis (and hence, the 3-place *-er*) should not be available for English and all phrasal comparatives must be derived from their clausal source by reduction operations. In the next section, we closely examine Lechner's arguments against the Direct Analysis and demonstrate that they can be defused. However, we also present certain binding facts, which as far as we can tell, cannot be similarly defused. On the basis of these facts, we conclude, in accordance with Lechner, that the 3-place *-er* is not available in English. We then turn our attention to Hindi-Urdu which we argue provides evidence that requires a Direct Analysis and the 3-place *-er*. Languages, then, vary in their lexical inventories with respect to degree operators and we consider some implications of this fact for a theory of crosslinguistic variation in the final section.

## 3. The Direct Analysis in English

### *3.1. Pinkham's Contrast*

Pinkham (1985:108) observes that a *than*-phrase must be extraposed in phrasal comparatives, as illustrated by the contrast between (10a) and (10b) (Pinkham's Contrast). Lechner (2004) submits the putative inability of the Direct Analysis to account for Pinkham's Contrast as one of the arguments against the Direct Analysis.

(10) a. * More men [than suits] wear sports jackets.

b. More men wear sports jackets [than suits].

Lechner argues that since the Direct Analysis should be able to assign the same structure in (11) to both (10a) and (10b), it would predict that they are equally grammatical, contrary to fact.

(11) [[sports jackets] [[-er [than suits]] [$\lambda d.\lambda x.$ [$d$-many men wear $x$]]]]

In contrast, the Reduction Analysis can attribute Pinkham's Contrast to the fact that a structure that can feed reduction operations is obtained only in (10b). This receives support from the fact that (10a) becomes grammatical if *wear* is not deleted.

(12) More men [than wear suits] wear sports jackets.

We agree with Lechner that Reduction Analyses can explain Pinkham's Contrast. But we disagree with his claim about the Direct Analysis. We note that the 3-place *-er* takes different scopes in (10a) and (10b) and the structure that the Direct Analysis assigns to (10a) is uninterpretable.

To set the stage for making this claim, let us first introduce certain details of the syntax of comparatives. First, we assume that the surface position of *than* marks the scope of the degree operator, following Bhatt and Pancheva (2004) and

Williams (1974). Since the extraposed position of *than* in (10b) is compatible with the clausal scope of *-er*, the structure in (11) can be postulated for (10b). In contrast, the surface position of *than* in (10a) and (12) suggests that *-er* does not take clausal scope. Instead, it appears to take scope in a position within the subject DP. The fact that (12) is grammatical indicates that there is a position within DP, in which the 2-place *-er* is interpretable. Matushansky (2002) argues that the DP-internal scope position of the 2-place *-er* is also motivated by other facts and proposes an analysis which allows the 2-place *-er* to take DP-internal scope. Capitalizing on the often advocated idea that DPs have a subject and they are type-wise the same as clauses , Matushansky claims that the 2-place *-er* undergoes QR DP-internally and it contributes to creating a structure in which *-er* can take two sets of degrees, as shown in (13) (see Matushansky 2002 for further details.).

(13) [$_{DP}$ ... [[-er [than [$\lambda d_1$.[$d_1$-many men wear suits]]]] $\lambda d_2$.[$x$ $d_2$-many men]]]

We are now ready to demonstrate that the Direct Analysis can also account for the ungrammaticality of (10a). In contrast to the 2-place *-er*, the 3-place *-er* is not interpretable within DP even though we assume a DP-internal subject. Let us consider (14) posited for (10a) along the lines of Matushansky. In order for the 3-place *-er* to take two individual arguments, the associate *sports jacket* needs to move into the subject DP from the object position in the matrix clause. Since movement of this sort would never be allowed, (14) ends up being uninterpretable.

(14) [[[$_{DP}$ ... [[-er [than suits]] [$\lambda d.\lambda x$. [$x$ $d$-many men]]]]]
[$\lambda y$.[$y$ wear [**sports jackets**]]]]

To sum up, Pinkham's Contrast does not either argue for or against one of the Direct Analysis and the Reduction Analysis.

### *3.2. Binding by Subjects*

Lechner (2004:214) presents the contrast in (15) as another argument against the Direct Analysis. (Associates are bold-faced.)

(15) a. **Sally** introduced him$_i$ to more friends than Peter$_i$'s sister.
b. *He$_i$ introduced **Sally** to more friends than Peter$_i$'s sister.

This contrast straightforwardly follows from the Reduction Analysis. Condition C is violated in (16b), which is the structure posited for (15b) with the silent material represented in the *than*-phrase.

(16) a. **Sally** introduced him$_i$ to more friends than Peter$_i$'s sister <introduced him$_i$ to d-many friends>.
b. *He$_i$ introduced **Sally** to more friends than <he$_i$ introduced> Peter$_i$'s sister <to d-many friends>.

Lechner argues that the Direct Analysis cannot handle the contrast in (15) because (17a, b), the structures assigned according to him by the Direct Analysis to (15) do not differ in the relevant respects.

(17) a. [$_{TP}$ **Sally** [$_{TP}$ [-er [than Peter$_i$'s sister]] [$\lambda d.\lambda x.$ [$_{TP}$ $x$ introduced him$_i$ to $d$-many friends]]]]

b. [$_{TP}$ **Sally** [$_{TP}$ [-er [than Peter$_i$'s sister]] [$\lambda d.\lambda x.$ [$_{TP}$ he$_i$ introduced $x$ to $d$-many friends]]]]

We suggest that there is an alternative approach to the contrast in (15). The generalization that emerges from (15b), together with the facts below, is that the subject always binds into a *than*-phrase.

(18) a. *__He__$_i$ introduced Sally to more friends than Peter$_i$'s sister.

b. *He$_i$ introduced more friends to **Sally** than (to) Peter$_i$'s sister.

These facts appear to indicate that QR of the degree operator targets a position below the subject in the Spec of TP. If this is correct, the structures posited for (15) under the Direct Analysis should be ones in (19), instead of (17). Here, the degree operator adjoins to *v*P by QR and (15b) is correctly ruled out by Condition C.

(19) a. [$_{TP}$ Sally [$_{vP}$ [-er [than Peter$_i$'s sister]] [$\lambda d.\lambda x.$ [$_{vP}$ $x$ introduced him$_i$ to $d$-many friends]]]]

b. *[$_{TP}$ he$_i$ $\lambda x.$ [$_{vP}$ [Sally] [$_{vP}$ [-er [than Peter$_i$'s sister]] [$\lambda d.\lambda y.$ [$_{vP}$ $x$ introduced $y$ to $d$-many friends]]]]]

Since other binding facts discussed in this section can also be explained by both the Reduction and the Direct Analyses, the contrast in (15) cannot be taken as an argument for or against one of these analyses, either.

### *3.3. The Full Binding Pattern*

Having defused certain arguments against the Direct Analysis in English, we now come to an argument that we are unable to defuse and which we therefore take to show that the Direct Analysis is in fact unavailable in English.

In the previous section, we have discussed the generalization that the subject always c-commands elements within a *than*-phrase. Another generalization that could potentially be made from the facts in (15), but is obscured by the predominant property of the subject is that the remnant is c-commanded by everything that c-commands the associate. Building on Lechner's observation in (15), we argue that this new generalization is supported by the binding facts in (20) and (21), in which the confounding factor caused by the subject is avoided by placing a relevant pronoun in non-subject positions. To illustrate the generalization, let us consider (20). In (20a), the pronoun c-commands the associate and hence, the remnant, which induces a violation of Condition C. A Condition C violation does not arise in (20c), in which the associate is not c-commanded by the pronoun.

(20) a. *More people introduced him$_i$ **to Sally** than to Peter$_i$'s sister.
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.
d. More people introduced him$_i$ **to Sally** than to himself$_i$.

(21) a. *More people gave him$_i$ **a picture of Sally** than a picture of Peter$_i$'s sister.
b. More people gave Peter$_i$ **a picture of Sally** than a picture of his$_i$ sister.
c. More people gave Peter$_i$ **a picture of Sally** than a picture of himself$_i$.

Unlike the subject pronoun cases in the previous section, the ungrammaticality of (20/21a) cannot be explained by claiming that a direct object and an indirect object always bind into a *than*-phrase because they do not, as shown in (22).

(22) 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.

As implied by Lechner's analysis of (15), this generalization is captured naturally under the Reduction Analysis because an associate and a remnant are situated in exactly the same syntactic configuration. In contrast, under the Direct Analysis, the position of an associate has nothing to do with that of a remnant at any stage of the derivation. Thus, the generalization above does not follow from this approach straightforwardly. Consequently, we take the binding generalization to show that the Direct Analysis (and accordingly, the 3-place *-er*) cannot be at work in English. If it was available, the Condition C violations in (20/21a) would not be accounted for.

## 4. Hindi-Urdu: A case for the Direct Analysis

We have seen that the Direct Analysis cannot be available in English and that we need a Reduction Analysis to handle English phrasal comparatives. Now we turn to phrasal comparatives in Hindi-Urdu. We find that the Direct Analysis is available and that it is the Reduction Analysis that is unavailable.

### *4.1. Basic Description*

We start with a basic description of phrasal comparatives in Hindi-Urdu. The remnant combines with the postposition *-se* 'than'. *-se*-phrases always precedes degree morphology.

(23) a. associate > remnant > more: ok

**Atif-ne** Boman-se zyaadaa kitaabẽ paṛh-ĩ:
Atif-Erg Boman-than more books.f read-Pfv.FPl

'Atif read more books than Boman.'

b. associate > more > remnant: *

*__Atif-ne__ zyaadaa kitaabẽ Boman-se paṛh-ĩ:
Atif-Erg more books Boman-than read-Pfv.FPl

'Atif read more books than Boman.'

As long as the remnant precedes *more*, no further restrictions are imposed on the relative order of the associate and the remnant: the remnant may precede the associate and there may be material between the associate and the remnant.

This ordering restriction makes sense once we note that the *than*-phrase is an argument of *more* and arguments precede their heads in Hindi-Urdu. In its merge configuration, the *than*-phrase precedes the degree head. From here the *than*-phrase can undergo further scrambling to the left allowing for surface non-adjacency between the remnant and the degree head as well as orders where the remnant precedes the associate.

The associate can be a PP or a DP and have any grammatical function. As (24e) shows, it can even be a temporal adverb as long as it is realized by a DP.

(24) a. associate = nominative subject:[4]

**Atif** Maya-se (zyaadaa) lambaa hai
Atif.M Maya-than more tall.MSg be.Prs.Sg

'Atif is taller than Maya.'

b. associate = ergative subject: (23)

c. associate = dative indirect object:[5]

Atif-ne **Mina-ko** Tina-se zyaadaa tohfe diye
Atif-Erg Mina-Dat Tina-than more presents.m give.Pfv.MPl

'Atif gave more presents to Mina than to Tina.'

d. associate = locative

**Amrika-me** Rus-se zyaadaa log rah-te haiN
America-in Russia-than more people stay-Hab.MSg be.Prs.Pl

'More people live in America than in Russia.'

e. associate = temporal adverb, realized by a DP

Atif-ne **aaj** kal-se zyaadaa kitaabẽ paṛh-ĩ:
Atif-Erg today yesterday-than more books.f read-Pfv.FPl

'Atif read more books today than yesterday.'

But if the putative associate is not a DP, the resulting phrasal comparative is not well-formed. This is in contrast to English phrasal comparatives where essentially any phrasal constituent can form the remnant. The adverbials *happily* and *unhappily*

[4]The degree head *zyaadaa* can be covert with a subclass of adjectives, for example with *lambaa* 'tall', but not with *utsuk* 'eager'. It must be overtly realized with attributive comparatives.

[5]This example is actually ambiguous in exactly the same way as *Atif gave more presents to Mina than Tina* i.e. the subject can also be the associate.

are not realized by DPs in Hindi-Urdu and consequently the corresponding phrasal comparative in (25b) is ungrammatical.

(25) a. More students read the textbook happily than unhappily.

b. *[khush ho kar] [dukhii ho kar]-se zyaadaa chaatrõ-ne kitaab
happy be do sad be do-than more people-Erg book.f
paṛh-i:
read-Pfv.f

Intended: 'More students read the textbook happily than unhappily.'

The remnant, which is marked by the postpositional *-se*, can only be a bare DP. The case marker on the associate cannot appear on the remnant.

(26) a. associate = ergative subject *Atif-ne*

*__Atif-ne__ Mina-ko Tina__-ne__-se zyaadaa tohfe diye
Atif-Erg Mina-Dat Tina-Erg-than more presents.m give.Pfv.MPl

intended meaning: 'Atif gave more presents to Mina than Tina.'

b. associate = dative indirect object *Mina-ko*

*Atif-ne __Mina-ko__ Tina__-ko__-se zyaadaa tohfe diye
Atif-Erg Mina-Dat Tina-Dat-than more presents.m give.Pfv.MPl

intended meaning: 'Atif gave more presents to Mina than to Tina.'

The ungrammaticality of (26a, b) fits with the general absence of case stacking in Hindi-Urdu and the fact that postpositions can only combine with DPs.

### *4.2. The Single Remnant Restriction*

Phrasal Comparatives in many languages allow for multiple remnants as can be seen in (27a). In contrast, phrasal comparatives in Hindi-Urdu only allow for a single remnant. Multiple remnants are sharply ungrammatical (see (27b)). We refer to this property of Hindi-Urdu phrasal comparatives as 'The Single Remnant Restriction'.

(27) a. Tina read more books today than **Pim yesterday**.

b. *Tina-ne aaj [**Pim kal-se**] zyaadaa kitaabẽ paṛh-ĩ:
Tina-Erg today Pim yesterday-than more books.f read-Pfv.FPl

intended: 'Tina read more books today than Pim yesterday.'

To convey this meaning, a clausal structure, which is realized by a correlative, must be used.

(28) [**Pim-ne kal** jitnii kitaabẽ paṛh-ĩ:] [Tina-ne aaj
Pim-Erg yesterday how.many.f books.f read-Pfv.FPl Tina-Erg today
us-se zyaadaa kitaabẽ paṛh-ĩ:]
that-than more books read-Pfv.FPl

'Tina read more books today than Pim yesterday.' (Literally: 'How many books Pim read yesterday, Tina read more books than that today.')

Lechner's Reduction Analysis offers a uniform treatment of comparatives with multiple remnants like (27a) and cases with a single remnant. But under such an analysis the Single Remnant Restriction found in Hindi-Urdu is unexpected.[6]

The Direct Analysis, however, predicts a Single Remnant Restriction. To see this consider a generalization of the 3-place *-er* into a $2n+1$-place *-er*. Such an *-er* would combine with $n$ associates, $n$ remnants, and a predicate of $n$ individuals and a degree. For (27a) where we have two associates, $n$ would be two and we would need a 5-place *-er*. In order to get the relevant arguments in place, we could QR all the associates and move the Deg head. But this does not actually deliver us the LF syntax we need. The remnants are not in the right place. They form a constituent (= *than*-clause) and *-er* cannot look into this constituent and extract its arguments. Consequently there is no straightforward way of extending a Direct Analysis based on a 3-place *-er* to handle multiple remnants.

This is a good result. Multiple remnants are absent in Hindi-Urdu and we take this absence of multiple remnants to show that a Direct Analysis is a viable option for phrasal comparatives in Hindi-Urdu and that a Reduction Analysis of the sort proposed by Lechner is not viable for the Hindi-Urdu data.

We speculate that a Reduction Analysis is ruled out for Hindi-Urdu because of a language particular interaction between the Hindi-Urdu *-se*, which is a postposition, and finite clauses. The relevant reduction processes that could yield the Reduction Analysis, such as Gapping, seem to be restricted to finite clauses in this language. However, finite clauses can never appear as complements of *-se*, or for that matter any postpositional element in Hindi-Urdu.

(29) a. John has been happy [since [Mary arrived]].

b. *John [Mary aa-ii hai]-se khush hai
John Mary come-Pfv.f be.Prs.Sg-from happy be.Prs.Sg
Intended: 'John has been happy since Mary arrived.'

To achieve this meaning, a correlative construction must be used where the finite clause complement of the postposition appears as a correlative which is associated with a pronoun that is the complement of the postposition.

(30) [jab-se Mary aa-ii hai] [tab-se John khush hai].
when-from Mary come-Pfv.f be.Prs.Sg then-from John happy be.Prs.Sg
'John has been happy since Mary arrived.'

[6]Merchant (2007) provides an alternative analysis of the Single Remnant Restriction which is compatible with the Reduction Analysis. His analysis begins with the observation that there are two kinds of *than*'s in Greek: *apo*, which only allows for DPs and imposes a Single Remnant Restriction, and *apoti*, which allows for a much wider range of constituents and does not impose a Single Remnant Restriction. He proposes that with *apo*, which is a preposition, the remnant moves into the object position of the preposition and it is the nature of the landing site that imposes the Single Remnant Restriction. His explanation is an attractive one for the Greek data but does not extend to the Hindi-Urdu data discussed here. The crucial examples are (24b-d). For reasons of space, we cannot go into further details here.

*4.3. A Precedence Constraint*

An important aspect of the Direct Analysis is that it assumes that there is a configuration in which *-er* combines with its two individual arguments and a predicate of individuals and degrees.

(31) [Associate [[Remnant -er] [$\lambda d.\lambda x.$ [Pred($x, d$)]]]]

When the associate is the subject, it is in the right place to combine with *-er*.

(32) [Subject [[Remnant -er] [$\lambda d.\lambda x.$ [Pred($x, d$)]]]]

But when the associate is not the subject, it must undergo movement to appear as an argument of *-er* and thereby create the compared predicate. In a language with covert movement, this movement need not be overt (see (9)).

As is well known from the scopal ambiguity of sentences like *Some boy likes every girl*, surface syntactic scope does not determine scopal relations in English. To derive scopal relations that do not correspond to surface scope, we need covert scope shifting operations. There are several ways of implementing a covert scope shifting operation. A common one is in terms of QR. It has also been noted that there are languages where covert scope shifting operations are either unavailable or very restricted. Hindi-Urdu is such a language as shown by the unavailability of inverse scope in (33a). To get inverse scope, overt scrambling is necessary as shown by (33b) (see Nevins & Anand 2003 for some qualifications).

(33) a. some > all, unavailable: all > some

kisi laṛke-ne har ṭiicar-se aashirvaad liyaa
some boy-Erg every teacher-from blessing.m take.Pfv.MSg

'Some boy took blessings from every teacher.'

b. all > some, also available: some > all

har ṭiicar-se kisi laṛke-ne aashirvaad liyaa
every teacher-from some boy-Erg blessing.m take.Pfv.MSg

'Some boy took blessings from every teacher.'

We take (33) to demonstrate the unavailability of covert QR of DPs in Hindi-Urdu. Given this unavailability, we predict any phrasal comparative where the associate is not in the right position to combine with *-er* on the surface to be deviant. We also predict that if overt scrambling brings the associate to a position where it can combine with *-er*, the deviance should disappear. (34) shows that this is the case.

(34) a. remnant > more > associate

*MP-se zyaadaa logõ-ne LGB paṛh-ii
MP-than more people-Erg LGB.f read-Pfv.f

'More people read LGB than the MP.' (intended, but unavailable)[7]
LF: *[[-er than the MP] [$\lambda d.$[$d$-many people read LGB]]]

[7]This sentence is actually grammatical but with a distinctive prosody which groups together *MP-*

b. associate > remnant > more

LGB MP-se zyaadaa logõ-ne paṛh-ii
LGB.f MP-than more people-Erg read-Pfv.f

'More people read LGB than the MP.'
LF: [LGB [[-er than the MP] [$\lambda d.\lambda x.$[$d$-many people read $x$]]]]

The precedence constraint found with Hindi-Urdu phrasal comparatives follows directly from the Direct Analysis combined with the independent unavailability of covert QR in Hindi-Urdu. One implication of the precedence constraint is that associates need to overtly move to the position where *-er* takes scope. As a result, the locality constraints in Hindi-Urdu phrasal comparatives are just locality constraints on overt movement. This is shown in (35). Relative clauses are islands for overt movement in Hindi-Urdu and an associate cannot move out of a relative clause island to combine with a degree head.

(35) *[Arundhati-ne]$_i$ Vikram-se zyaadaa log [vo kitaab [jo t$_i$ likh-ii
Arundhati-Erg Vikram-than more people that book Rel write-Pfv.f
hai]] paṛh-ẽ:ge
be.Prs.Sg read-Fut.3MPl

Intended: 'More people will read the book that Arundhati wrote than (the book that) Vikram (wrote).'

### *4.4. Binding Effects*

The data from binding effects in English phrasal comparatives was crucial in deciding that the Direct Analysis could not be available in English. With respect to binding, the remnant DP in an English phrasal comparative seemed to have the same possibilities as the associate. This property could be made to follow naturally within a Reduction Analysis but could not be handled within a Direct Analysis. We have argued so far that the Direct Analysis is available in Hindi-Urdu and that the Reduction Analysis is not. Therefore we expect the binding properties of the remnant in Hindi-Urdu phrasal comparatives to be different from English. In particular, we do not expect there to be a connection between the binding possibilities of the associate and the binding possibilities of the remnant.

According to the Direct Analysis, the remnant is a PP and thus we expect it to pattern with other PPs with respect to binding properties. This turns out to be the case. The binding properties of PPs in Hindi-Urdu are as follows:

---

*se* 'MP-than' and *zyaadaa* 'more' and puts a pause between *zyaadaa* and *logõ-ne* 'people-Erg'. The interpretation associated with this prosody could be characterized as follows: 'it would be more appropriate to say that people read LGB than to say that people read MP'. We have not worked out the details of how this reading is to be derived but what already seems clear is that this interpretation works off a structure where the *zyaadaa* 'more' does not form a constituent with the subject or quantify over a degree argument associated with the subject. Support for this comes from the fact that the relevant interpretation is available even when the subject *logõ-ne* 'people-Erg' is replaced by a non-degree-quantifiable proper name subject.

(36) a. Subjects can bind reflexives and reflexive possessors inside PPs. Pronominal possessors inside PPs cannot be coreferent with the subject.

b. PPs pattern with arguments with respect to Principle B.

c. Co-arguments that precede the PP c-command it and the PP c-commands co-arguments that follow it.

The *than*-phrase in Hindi-Urdu has exactly the binding properties outlined above. We demonstrate some of these properties here. Pronominal *than*-phrases as well as pronominal possessors inside *than*-phrases display obviation with respect to the subject. To achieve binding with the subject, an anaphor must be used.

(37) a. anaphoric binding, pronominal obviation by subject:

koi-bhii$_i$ apne aap-se$_i$/us-se$_{j/*i}$ lambaa nahĩ: ho sak-taa
anyone self's self-than/him-than tall Neg be can-Hab.MSg

'No one$_i$ can be taller than himself$_i$/him$_{j/*i}$.

b. anaphoric binding, pronominal obviation of possessors by subject:

Atif$_i$ apnii$_i$/us-kii$_{j/*i}$ behen-se lambaa hai
Atif self.f/he-Gen.f sister-than tall be.Prs.Sg

'Atif$_i$ is taller than self$_i$'s sister/his$_{j/*i}$ sister.'

Without providing the actual examples, we note that pronominal *than*-phrases trigger Principle B effects with respect to other arguments. But non-subject arguments do not obviate pronominal possessors inside *than*-phrases. The binding possibilities of *than*-phrases are fully determined by its surface position with respect to other arguments of its predicate. (38/39a) show us that if a pronominal co-argument precedes the *than*-phrase it cannot be coreferent with a proper name inside the *than*-phrase. When the relative order is reversed as in (38/39b), coreference is possible.

(38) a. ....pron$_i$...[than Peter's$_i$ sister].... : coreference is not ok

**Sally-ne** us-ko$_i$ Peter-kii$_{j/*i}$ behen-se zyaadaa logõ-se
Sally-Erg he-Dat Peter-Gen.f sister-than more people-with
milvaa-yaa
introduce-Pfv.MSg

'**Sally** introduced him$_i$ to more people than Peter's$_i$ sister.

b. ...[than Peter's$_i$ sister]....pron$_i$..... : coreference is ok

**Sally-ne** Peter-kii$_i$ behen-se us-ko$_{i/j}$ zyaadaa logõ-se
Sally-Erg Peter-Gen.f sister-than he-Dat more people-with
milvaa-yaa
introduce-Pfv.MSg

'**Sally** introduced him$_i$ to more people than Peter's$_i$ sister.

(39) a. ....pron$_i$...[than Peter's$_i$ sister].... : coreference is not ok

**Sally-kii foto** us-ko$_i$ Peter-kii$_{j/*i}$ behen-kii foto-se zyaadaa
Sally-Gen.f photo he-Dat Peter-Gen.f sister-Gen.f photo-than more
logõ-ne dii
people-Erg give.Pfv.f

'*More people gave him$_i$ **a picture of Sally** than a picture of Peter$_i$'s sister.

b. ...[than Peter's$_i$ sister]....pron$_i$..... : coreference is ok

**Sally-kii foto** Peter-kii$_i$ behen-kii foto-se zyaadaa
Sally-Gen.f photo Peter-Gen.f sister-Gen.f photo-than more
logõ-ne us-ko$_{i/j}$ dii
people-Erg he-Dat give.Pfv.f

'*More people gave him$_i$ **a picture of Sally** than a picture of Peter$_i$'s sister. (ungrammatical in English, good in Hindi-Urdu)

Note that the binding behavior of the *than*-phrases follows directly from its surface syntax. We did not need to postulate covert clausal structure to explain its binding properties. The structural location of the boldfaced associate does not play any role in determining the binding possibilities of the *than*-phrase. In all the examples in (38) and (39), the associate precedes (and c-commands) the pronoun. Yet only some are good. We would like to add, without offering the relevant examples in the interest of conserving space, that scrambling the pronoun to precede the associate in variants of (38/39) does not change the binding possibilities as long as the relative order between the pronoun and the *than*-phrase is maintained.

To sum up, we have seen that the binding data that forced us to abandon the Direct Analysis for English is not available in Hindi-Urdu. The binding properties of the *than*-phrase in Hindi-Urdu are the same as the binding properties of ordinary PPs and do not need a special treatment. They do not constitute an argument against the availability of the Direct Analysis.

## 5. Scope inside and outside *than*-phrases

Quantifiers inside a *than*-phrase in a phrasal comparative seem to be able to scope out in contrast to quantifiers inside a *than*-clause in a clausal comparative.

(40) a. John is taller than no one.

b. #John is taller than no one is.
(Brame 1983:332)

If negative quantifiers don't exist as lexical primitives, the above data can be thought of as indicating that a matrix negation can combine with an indefinite across a phrasal *than* but not across a clausal *than*. They do not therefore constitute a solid case where a QP scopes out of a *than*-phrase. The following constitutes a clearer case for scoping a QP out of a *than*-phrase.

(41) Mary, a first grader, is taller than every third grader in our school.

a. unavailable: *-er* > *every*
[[-er [$\lambda d$. [every third grader is $d$-tall]]] [$\lambda d$.[Mary is $d$-tall]]] ($\approx$ Mary is taller than the shortest third grader. (assuming monotonicity))

b. available: *every* > *-er*
[[every third grader] [$\lambda x$. [[-er [$\lambda d$.[$x$ is $d$-tall]]] [$\lambda d$.[Mary is $d$-tall]]]]]
($\approx$ For every third grader $x$, Mary is taller than $x$.)

(see Heim 2000, 2006, Larson 1988, Schwarzschild and Wilkinson 2002)

Such facts receive a very straightforward treatment within the Direct Analysis. The 3-place *-er* involved in the Direct Analysis combines with individual arguments and so any quantificational expressions need to QR out. But they can be handled by a Reduction Analysis also which can appeal to the fact that the interpretive restrictions noted for (41) also apply to *Mary is taller than every third grader in our school is*, a clausal comparative. Then whatever mechanism one uses to handle this clausal comparative can be used to handle (41) by a proponent of the Reduction Analysis.

Let us therefore examine whether the reverse case exists: a case where a QP takes scope within the *than*-phrase. (42) seems to be such a case. Here it seems that the *than*-phrase-internal QPs take scope within the *than*-phrase.

(42) More students read every syntax paper than every semantics paper.

a. *than*-phrase-internal scope:
[-er [$\lambda d$.[$d$-many students read every semantics paper]]]
[$\lambda d$.[$d$-many students read every syntax paper]]
The number of students who read every syntax paper exceeds the number of students who read every semantics paper.

b. *than*-phrase-external scope: ???
[every syntax paper] $\lambda x$.[every semantics paper] $\lambda y$.
[[-er [$\lambda d$. [$d$-many students read $y$]]]
[$\lambda d$. [$d$-many students read $x$]]]
The least read syntax paper was still read by more people than any semantics paper. (paraphraseable as: every syntax paper was read by more students than every semantics paper.)

(Carl Pollard, p.c., paraphrase of (42b) suggested by Lisa Travis)

It is not clear to us whether these QPs can take scope out of the *than*-phrase i.e. whether the reading indicated by (42b) is actually available. More generally the question arises as to when a QP can take scope inside a *than*-phrase and when it must (seem to) scope out. It seems to us that the generalization is as follows.

(43) If a QP c-commands the site of degree abstraction, it must scope out. Otherwise it takes scope within the *than*-phrase.

a. degree abstraction c-commands QP: *than*-phrase-internal scope ok
Craige assigned more students every paper by Egli than every paper by Klein.

b. QP c-commands degree abstraction: QP must scope out
Craige assigned every first year student more papers than every second year student.

What this generalization tells us is that the need/ability to scope out of a *than*-phrase is not reducible to a subject/non-subject asymmetry. Instead it is only making reference to the hierarchical relationship between the remnant and the site of degree abstraction within an abstract clause that this generalization can be stated. This by itself suggests the need for a Reduction Analysis in English.

We saw earlier that both a Direct Analysis and a Reduction Analysis can handle cases of QPs (apparently) scoping out of *than*-phrases. What about cases of QPs scoping inside *than*-phrases? Such cases are easy for a Reduction Analysis to handle. But not for a Direct Analysis, which forces any quantificational expressions to scope out. There is simply no other alternative.[8]

We now make a rather strong prediction. Given that we have argued that only the Direct Analysis and not the Reduction Analysis is available for phrasal comparatives in Hindi-Urdu, we predict that the judgements for the Hindi-Urdu counterpart of (42) will be the mirror image of the English (42) i.e. the scoping-in reading shown in (42a) will be unavailable and the scoping-out reading shown in (42b) will be available. This is in fact the case. The Hindi-Urdu counterpart of (42) does not allow for the *than*-phrase-internal scope reading. The only interpretation available is the external scope reading.

(44) [har syntax paper] [har semantics paper]-se zyaadaa logõ-ne
every syntax paper every semantics paper-than more people-Erg
paṛh-aa
read-Pfv

'More people read every syntax paper than every semantics paper.'
*every* > *-er*: available; *-er* > *every*: unavailable

To get the *than*-phrase-internal scope, a clausal comparative must be used.

(45) [jitne logõ-ne har semantics paper paṛh-aa] [us-se zyaadaa
how.many people-Erg every semantics paper read-Pfv that-than more
logõ-ne har syntax paper paṛh-aa]
people-Erg every syntax paper read-Pfv

'More people read every syntax paper than did every semantics paper.'

[8] An alternative would become available if we had a higher order *-er*$_{high}$ that combined with two quantifiers and a predicate of degrees and quantifiers.

(i) $[\![ \text{-er}_{high} ]\!] = \lambda Q_{(et)t}.\lambda \mathscr{D}_{d((et)t)t}.\lambda P_{(et)t}.\exists d[\mathscr{D}(P,d) \wedge \neg \mathscr{D}(Q,d)]$

Such a higher order *-er* would allow for a QP to take scope inside the *than*-phrase even with the Direct Analysis and would generate the desired meaning for (42). But this entry for *-er* would also allow for a QP to take scope within the *than*-phrase in cases like (41). Since in Hindi-Urdu neither is a possibility, we must conclude that *-er*$_{high}$ is not available. We speculate that even if *-er*$_{high}$ were available, Beck's (1996)/Fox's (2000) constraint against higher order traces would make it unusable.

The scope facts thus provide additional support for our two claims. The first is that the Direct Analysis is available in Hindi-Urdu but not in English. This is why Hindi-Urdu allows/forces for *than*-phrase-internal QPs to scope out in (44) but English does not. The second is that the Reduction Analysis is available in English but not in Hindi-Urdu. The differential availability of the Reduction Analysis explains why QPs can scope-in in the English (42a) but not in the Hindi-Urdu (44).

## 6. Handling Crosslinguistic Variation

We have demonstrated that phrasal comparatives in English and Hindi-Urdu differ systematically. English phrasal comparatives involve a Reduction Analysis and block a Direct Analysis. The crucial data for this came from the binding properties of the remnant. Additional support came from the scopal properties of remnants. This means that English only has one *-er*, which is a 2-place *-er*.

Hindi-Urdu phrasal comparatives present a more complex picture. The binding data does not rule out the Direct Analysis while the Single Remnant Restriction and the scope facts argue against the Reduction Analysis. The Direct Analysis requires a 3-place *-er*. But we also need a 2-place *-er* to handle the *more than n* cases. Hindi-Urdu, then, has both a 2-place *-er* and a 3-place *-er*.

We would now like to explain why these languages differ in these ways. Why does Hindi-Urdu lack the Reduction Analysis, why does English lack the Direct Analysis, and why does English lack a 3-place *-er*? These are three questions but they actually reduce to two. The absence of a Direct Analysis in English follows directly from the absence of a 3-place *-er*. So it is left to explain why Hindi-Urdu lacks the Reduction Analysis and why English lacks a 3-place *-er*. We have already provided a speculation concerning the first question. We think that the Reduction Analysis is unavailable for Hindi-Urdu phrasal comparatives because the environment in which the relevant reduction operations such as gapping would need to apply is systematically unavailable in Hindi-Urdu. Such operations apply to finite clauses in Hindi-Urdu and finite clauses cannot appear as a complement of a postposition, which is what the Hindi-Urdu *-se* is. Consequently the Reduction Analysis is unavailable - not due to a specific constraint against it but due to independent properties of the language.

We now come to the last question: why does English lack a 3-place *-er*. The right way to answer this question, we believe, is to turn it around. Why does Hindi-Urdu have a 3-place *-er*? As far as we know all languages with comparatives have a 2-place *-er*. Why does Hindi-Urdu come to have a 3-place *-er*? Our suggestion is that 2-place *-er* is part of a universal lexical inventory. A learner of any language gets it for free. 3-place *-er*, however, is only postulated if there is evidence. It is in a sense extrapolated from the lexical entry for 2-place *-er*. In English, the relevant reduction operations are available and there is no evidence that forces the learner to assume a 3-place *-er* (and a Direct Analysis to go with it). But in Hindi-Urdu, the learner is unable to use the relevant reduction operations in the complement of

*-se*/'than', forcing the learner to assume a 3-place *-er* and a Direct Analysis to go with it.

## References


Beck, Sigrid: 1996, *Wh-constructions and transparent Logical Form*, Doctoral Dissertation, Universität Tübingen, Tübingen, Germany.

Bhatt, Rajesh and Roumyana Pancheva: 2004, 'Late Merge of Degree Clauses', *Linguistic Inquiry* **34**, 1–45.

Brame, Michael: 1983, 'Ungrammatical notes 4: Smarter than me', *Linguistic Analysis* **12**, 323–328.

Fox, Danny: 2000, *Economy and Semantic Interpretation*, No. 35 in Linguistic Inquiry Monographs. MIT Press, Cambridge, MA.

Heim, Irene: 1985, 'Notes on Comparatives and Related Matters'. Unpublished manuscript, University of Texas at Austin.

Heim, Irene: 2000, 'Degree Operators and Scope', in *Proceedings of SALT X*, 40–64. Cornell Linguistics Club, Cornell University, Ithaca, NY.

Heim, Irene: 2006, 'Remarks on Comparative Clauses as Generalized Quantifiers'. Unpublished manuscript, MIT.

Larson, Richard: 1988, 'Scope and Comparatives', *Linguistics and Philosophy* **11**, 1–26.

Lechner, Winfried: 2001, 'Reduced and phrasal comparatives', *Natural Language and Linguistic Theory* **19**, 683–735.

Lechner, Winfried: 2004, *Ellipsis in Comparatives*. Mouton de Gruyter, Berlin.

Matushansky, Ora: 2002, *Movement of degree/degree of movement*, Doctoral Dissertation, MIT, Cambridge, MA.

Merchant, Jason: 2007, 'Phrasal and clausal comparatives in Greek and the abstractness of syntax'. Unpublished manuscript, University of Chicago.

Nevins, Andrew and Pranav Anand: 2003, 'Some AGREEment matters', in G. Garding and M. Tsujimura (eds.), *Proceedings of WCCFL 22*, 370–383. Cascadilla Press, Somerville, MA.

Pancheva, Roumyana: 2006, 'Phrasal and Clausal Comparatives in Slavic', in *Formal Approaches to Slavic Linguistics 14: The Princeton Meeting*.

Pancheva, Roumyana: 2007, 'Than'. Handout of Talk Presented at GLOW XXX, Tromsø, April 14.

Pinkham, Jessie: 1985, *The Formation of Comparative Clauses in French and English*. Garland, New York.

Richards III, Norvin W.: 1997, *What Moves Where When in Which Language?*, Doctoral Dissertation, MIT, Cambridge, MA.

Schwarzschild, Roger and Karina Wilkinson: 2002, 'Quantifiers in Comparatives', *Natural Language Semantics* **10**, 1–41.

Williams, Edwin: 1974, *Rule Ordering in Syntax*, Doctoral Dissertation, MIT, Cambridge, MA.