Interpreting long scrambling in Hindi-Urdu*

Stefan Keine & Ethan Poole

University of Southern California & University of California, Los Angeles

1. Introduction

Moved elements exhibit *reconstruction effects*, or more neutrally *connectivity effects*, with their premovement positions (Barss 1986, Kroch 1989, Cinque 1990, Cresti 1995, Heycock 1995, Rullmann 1995, Romero 1997, 1998, Fox 1999, Frampton 1999, Sportiche 2006, Lebeaux 2009; amongst many others). That is, moved elements may display behavior that we would expect them to display if they had not moved. For example, the A-moved subject in (1) may take scope either above or below the modal operator *is likely*. The narrow-scope interpretation in (1b) corresponds to the launching site of movement and thereby the scope that the expression would have received if it had not moved.

(1) [Someone from Minnesota]$_1$ is likely [___$_1$ to win the lottery].

a. *someone* ≫ *likely*:
There is a (particular) person from Minnesota who is likely to win the lottery.

b. *likely* ≫ *someone*:
It is likely that there is a person from Minnesota who will win the lottery.

The predominant view of reconstruction effects since the advent of the Copy Theory of Movement (Chomsky 1993, 1995) is that they are the result of interpreting only the lower copy of the moved element at LF. Assuming the relevant syntactic and semantic constraints apply at LF, then then will only apply to the lower copy. It will thus appear as if the element had not undergone movement, yielding reconstruction effects. Adopting the terminology in Sportiche (2016), we will refer to this procedure as *neglecting the higher copy*.[1]

---

*Many thanks to Sakshi Bhatia, Rajesh Bhatt, Bhamati Dash, and Anoop Mahajan for sharing their Hindi judgements. We are indebted to Winnie Lechner for helpful discussion and extensive comments, in addition to Itai Bassi, Rajesh Bhatt, Amy Rose Deal, Peter Jenks, Anoop Mahajan, Roumi Pancheva, Gillian Ramchand, Dominique Sportiche, Ekaterina Vostrikova, and audiences at NELS 48, GLOW 41, UCLA, and UC Berkeley.

[1]The early literature on reconstruction effects commonly attributed them to *LF Lowering*, whereby the element is literally moved back into its launching site at LF (e.g. Chomsky 1976, May 1985, Cinque 1990).

The copy-theoretic view of reconstruction was bolstered by Romero's (1997, 1998) and Fox's (1999) arguments that reconstruction effects travel together (see also Heycock 1995). In particular, they argue that scope reconstruction and Condition C connectivity correlate: when a moved element reconstructs for scope, it is evaluated for Condition C in the position to which it scopally reconstructs. A representative example is given in (2), where scope reconstruction is blocked in a configuration where binding connectivity with the launching site of movement would yield a Condition C violation.

(2) *Condition C connectivity forces wide scope*
[How many pictures that **John$_2$** took in Sarajevo]$_1$ does **he$_2$** want the editor to publish ___$_1$ in the Sunday Special?

a. *Wide-scope reading*
✓For what number *n*: There are *n*-many particular pictures *x* that John took in Sarajevo such that John wants the editor to publish *x*.

b. *Narrow-scope reading*
*For what number *n*: John wants the editors to publish in the Sunday Special (any) *n*-many pictures that John took in Sarajevo. [Romero 1998:96]

Compare (2) to (3), where the R-expression and the pronoun are swapped, so that binding connectivity would not induce a Condition C violation, and scope reconstruction is possible.

(3) *Swapping the R-expression and the pronoun* (✓narrow, ✓wide)
[How many pictures that **he$_2$** took in Sarajevo]$_1$ does **John$_2$** want the editor to publish ___$_1$ in the Sunday Special? [Romero 1998:96]

The correlation between scope and Condition C connectivity exemplified in (2)–(3) follows without further ado from analyzing reconstruction effects as higher-copy neglection, as this predicts that (all) reconstruction effects should travel together. When the higher copy is interpreted, the moved element takes scope in the landing site of movement and the R-expression is not in the c–command domain of the coindexed pronoun, satisfying Condition C (4a).[2,3] When the higher copy is neglected, the moved element takes scope in the launching site of movement and the R-expression is in the c–command domain of the coindexed pronoun, incurring a fatal violation of Condition C (4b).

Such an approach shares with the copy-theoretic approach the key idea that the moved element is evaluated in its launching site at LF. In light of the prevalence of the copy-theoretic view of movement and the ban on downwards movement, we subsume this approach under the copy-theoretic approach to reconstruction.

[2]Something needs to be said about why the R-expression in the lower copy does not invariably trigger a Condition C violation. The explanation is tied to the relative clause, as this is a so-called "Lebeaux" effect (Lebeaux 1990). The standard explanation is that the relative clause can be countercyclically late merged onto the moved element, so that the lower copy never contains the offending R-expression. Crucially, late merge bleeds being able to neglect the higher copy because it would strand the relative clause without a host; thus, if the higher copy is to be neglected, the relative clause must be first-merged in the lower copy. However, the claims in this paper are not contingent on late merge being the explanation of Lebeaux effects.

[3]This is not to imply that the lower copy is not interpreted in (4a). It may be interpreted as a simple bound variable or a bound definite description (Engdahl 1980, 1986, Sauerland 1998, 2004, Fox 1999, 2002).

(4) a. *Derivation of (2a): Interpreting the higher copy* (DP ≫ want)

[$_{DP}$ … **R-expr$_1$** …] … **pron$_1$** … want … ~~[$_{DP}$ … R-expr$_1$ …]~~ …

b. *Derivation of (2b): Neglecting the higher copy* (want ≫ DP)

* ~~[$_{DP}$ … R-expr$_1$ …]~~ … **pron$_1$** … want … [$_{DP}$ … **R-expr$_1$** …] …

In this paper, we argue that the reconstruction effects and interpretation of long scrambling in Hindi-Urdu (henceforth, Hindi) cannot be reduced to higher-copy neglection alone. The argument is based on the novel observation that not all reconstruction effects travel together in Hindi. In particular, scope reconstruction does *not* correlate with Condition C connectivity, unlike English (see (2)). However, neither is it the case that all reconstruction effects are independent from one another in Hindi: Condition C connectivity does in fact correlate with reconstruction for referential opacity, i.e. when the moved element is interpreted opaquely with respect to a modal operator (also observed for English by Sharvit 1998). This state of affairs does not follow from an all-or-nothing approach to reconstruction, like the copy-theoretic approach. Rather, we argue that Hindi long scrambling requires the hybrid approach to reconstruction developed on independent grounds by Lechner (1998, 2013, to appear), where *both* higher-copy neglection and higher-type traces are available as independent interpretation mechanisms. Higher-type traces allow for a moved element to take scope in its launching site (Cresti 1995, Rullmann 1995), but through purely semantic means and crucially without inducing Condition C connectivity. This more fine-grained approach to reconstruction importantly entails that not all reconstruction effects are syntactic.

2. Long scrambling in Hindi-Urdu

Hindi is an SOV language with fairly liberal scrambling (Mahajan 1990, Gurtu 1992, Dayal 1994, Kidwai 2000). Scrambling can apply within a finite clause, as well as across finite-clause boundaries, though it displays different properties in each case. We will refer to scrambling within a finite clause as *local scrambling*, and to scrambling that leaves a finite clause as *long scrambling*. In this paper, we will be primarily concerned with the interpretive properties of long scrambling.

An important contrast between local and long scrambling is that, while local scrambling allows the moved element to take scope in the landing site of movement, long scrambling does not. The ability of local scrambling to extend scope in this manner is illustrated in (5). The SOV base order in (5a) is scope rigid and requires the subject to scope over the object. When the object is local-scrambled over the subject, as in (5b), it may take scope over the subject; reconstruction is also possible, though not shown here.

(5) a. [*kisii vipakshii netaa-ne*] [**har samasyaa**] khadii kii hai
some opposition politician-ERG every problem cause did AUX
'Some opposition politician caused every problem.' (∃ ≫ ∀; *∀ ≫ ∃)

b. [**har samasyaa**]$_1$ [*kisii vipakshii netaa-ne*] ___$_1$ khadii kii hai
every problem some opposition politician-ERG cause did AUX
'Every problem, some opposition politician caused.' ($\forall \gg \exists$)

This behavior in (5) contrasts with long scrambling, as shown in (6), where the embedded object *every problem* 'har samasyaa' is long-scrambled out of the finite clause and above the matrix subject *some opposition politician*-ERG 'kisii vipakshii nataa-ne'. Even though the scrambled embedded object occupies a syntactic position higher than the matrix subject, the embedded object may not take scope over the matrix subject. In other words, the long-scrambled DP obligatorily reconstructs for scope into the embedded clause.[4]

(6) [**har samasyaa**]$_1$ [*kisii vipakshii netaa-ne*] socaa hai
every problem some opposition politician-ERG thought AUX
[$_{CP}$ ki pradhaan mantrii-ne ___$_1$ khadii kii hai]
that Prime.Minister-ERG cause did AUX
'Every problem, some opposition politician thought that the Prime Minister had caused.' ($\exists \gg \forall$; ?*$\forall \gg \exists$)

Given the fact that scope reconstruction is obligatory for long scrambling, one might expect that it obligatorily displays connectivity for other LF principles, namely Condition C, especially in light of the arguments in Romero (1997, 1998) and Fox (1999). However, this is not the case. Long scrambling does *not* give rise to Condition C connectivity with respect to an R-expression embedded inside a relative clause attached to the scrambled DP. This is illustrated by the contrast in (7). In the nonmovement baseline (7a), the embedded object contains an R-expression that is coindexed with the matrix subject. Unsurprisingly, this configuration violates Condition C. In (7b), the embedded object is long-scrambled out of the finite clause and above the matrix subject. Crucially, no Condition C violation obtains in (7b). This effect mirrors familiar Condition C obviation effects with $\overline{\text{A}}$-movement in English (see fn. 2), and existing analyses for English seem to extend to Hindi. What is crucial for the purposes of this paper is that long scrambling in Hindi does *not* display connectivity for Condition C despite the fact that it shows obligatory reconstruction for quantifier scope.

(7) a. * $\boxed{\text{us-ne}_1}$ socaa [$_{CP}$ ki siitaa-ne kal [$_{DP}$ **vo kitaab jo**
3SG-ERG thought that Sita-ERG yesterday that book that
$\boxed{\textbf{raam-ko}_1}$ **pasand thii**] bec dii thii]
Ram-DAT like AUX sell give AUX
'He$_1$ thought that Sita had sold the book that Ram$_1$ liked yesterday.'

[4] While most of our informants do not accept the wide-scope reading in (6), one of our informants does find it acceptable. It is possible that this discrepancy is a matter of dialectal variation. Notwithstanding, the crucial connectivity facts to be discussed below hold for this speaker as well: scope reconstruction does not induce Condition C connectivity, but reconstruction for referential opacity does. This pattern of judgments is therefore fully compatible with the conclusions reached here. For the sake of simplicity, the main text presents the pattern of judgments of speakers for whom scope reconstruction is obligatory.

b. [$_{DP}$ **vo kitaab jo** $\boxed{\textbf{raam-ko}_1}$ **pasand thii**]$_2$ $\boxed{\text{us-ne}_1}$ socaa [$_{CP}$
that book that Ram-DAT like AUX 3SG-ERG thought
ki siitaa-ne kal ___$_2$ bec dii thii]
that Sita-ERG yesterday sell give AUX
'The book that Ram$_1$ liked, he$_1$ thought that Sita had sold yesterday.'

Note that (7) also demonstrates that long scrambling in Hindi is not simply semantically inert, as has sometimes been claimed for long scrambling in Japanese (i.e. so-called 'radical reconstruction', see Bošković & Takahashi 1998, Saito 2004). It is therefore not amenable to an account in terms of 'PF movement' (in the sense of Sauerland & Elbourne 2002).

The evidence so far points to a dissociation between scope reconstruction and Condition C connectivity in the case of Hindi long scrambling. Additional direct support for such a dissociation comes from the example in (8). This example involves long scrambling of a quantificational DP that contains a relative clause with an R-expression that is coindexed with the matrix subject. The long scrambling crosses over (i) a quantificational object in the matrix clause and (ii) the matrix subject. The resulting structure allows us to directly assess the relation between scope reconstruction and Condition C connectivity, if any. As indicated, the resulting sentence is grammatical and hence does not display Condition C connectivity, and, moreover, it only has a narrow-scope interpretation of the scrambled embedded object. This finding is consistent with (6) and (7) above: long scrambling obligatorily reconstructs for quantificational scope, but exhibits no connectivity for Condition C. (8) shows that this discrepancy holds even within one and the same structure.

(8) [$_{DP}$ **har kitaab** jo $\boxed{\text{raam-ko}_1}$ pasand hai]$_2$ $\boxed{\text{us-ne}_1}$ **kisii laṛkii-se**
every book that Ram-DAT like AUX 3SG-ERG some girl-INSTR
kahaa [$_{CP}$ ki miinaa-ne kal ___$_2$ bec dii]
said that Mina-ERG yesterday sell give
'Every book that Ram$_1$ likes, he$_1$ told some girl that Mina sold yesterday.'
($\exists \gg \forall$; ?*$\forall \gg \exists$)

This dissociation between scope and Condition C has important ramifications for generalizations about the relation that holds between the two. As discussed in section 1, Romero (1997, 1998) and Fox (1999) argue that scope reconstruction and Condition C connectivity travel together. The Hindi evidence indicates that this correlation is not always the case: the moving element in (8) takes scope in its *launching* site, but it is evaluated for Condition C in its *landing site*. The generalization that the two always covary thus is too strong empirically, at least as a crosslinguistic characterization of reconstruction effects.

At the same time, it is not the case that Condition C is simply altogether independent of reconstruction in Hindi. Condition C connectivity does track reconstruction for referential opacity—i.e. the world variable of the moved DP being bound by a modal operator that it moves over. The crucial evidence for this claim comes from the paradigm in (9). The scenario in (9) is designed so that the description *ghost that loves him* is true relative to Pratap's belief worlds, but false relative to the evaluation world (i.e. the actual world), given that what Sangita saw was not actually a ghost. (9a) constitutes the nonmovement baseline; the embedded object *ek bhuutnii jo us-se pyaar kartii hai* 'a ghost that loves him' is embedded below the intensional predicate *soctaa* 'think'. As expected, the embedded object can be interpreted opaquely with respect to *soctaa* 'think'; that is, (9a) is true in the given scenario. The examples in (9b,c) investigate how the availability of this opaque interpretation interacts with scrambling. In (9b), the embedded object is long-scrambled above the matrix subject. (9b) still allows an opaque interpretation of the moved DP with respect to *soctaa* 'think', i.e. the sentence is still true in the given scenario. Because the landing site of the scrambled DP is above *soctaa* 'think', this interpretation requires reconstructing the moved DP into the embedded clause for the purposes of world-variable binding. Thus, reconstruction for referential opacity is possible in (9b). Against this backdrop, the crucial example is (9c). (9c) is identical to (9b), except that the R-expression and the pronoun have been swapped so that the R-expression is now inside the scrambled DP. As such, if the moved DP were to be evaluated for Condition C in its launching site, it would incur a Condition C violation. Importantly, the sentence in (9c) is not judged as true in the given scenario. The only available interpretation is one where the moved DP is interpreted *transparently* with respect to *soctaa* 'think'; in other words, (9c) commits the speaker to the claim that Sangita saw an actual ghost and is thus infelicitous.

(9) *Scenario:*
Pratap incorrectly believes that there exists a ghost in his backyard that is in love with Pratap. One day, Sangita sees some animal out of the corner of her eye in Pratap's backyard. Upon reporting this incident to Pratap, Pratap is convinced (incorrectly) that what Sangita saw was the ghost that he believes lives in his backyard.

a. *Non-movement baseline → Opaque reading possible*
prataap$_1$ **soctaa** hai [$_{CP}$ ki sangiitaa-ne [$_{DP}$ ek **bhuutnii** jo us-se$_1$
Pratap thinks AUX that Sangita-ERG a ghost REL him-INSTR
pyaar kartii hai] dekhii]
love do AUX saw
'Pratap$_1$ thinks that Sangita saw a ghost that loves him$_1$.'

b. *No Condition C configuration → Opaque reading possible*
[$_{DP}$ ek **bhuutnii** jo $\boxed{\text{us-se}_1}$ pyaar kartii hai]$_2$ $\boxed{\text{prataap}_1}$ **soctaa**
a ghost REL him-INSTR love do AUX Pratap thinks
hai [$_{CP}$ ki sangiitaa-ne ___$_2$ dekhii]
AUX that Sangita-ERG saw
'A ghost that loves him$_1$, Pratap$_1$ thinks that Sangita saw.'

c. *Condition C configuration → No opaque reading possible*
#[$_{DP}$ ek **bhuutnii** jo $\boxed{\text{prataap-se}_1}$ pyaar kartii hai]$_2$ $\boxed{\text{vo}_1}$ **soctaa** hai
a ghost REL Pratap-INSTR love do AUX he thinks AUX
[$_{CP}$ ki sangiitaa-ne ___$_2$ dekhii]
that Sangita-ERG saw
'A ghost that loves Pratap$_1$, he$_1$ thinks that Sangita saw.'
(*entails actual existence of ghost*)

The unavailability of an opaque reading in (9c) demonstrates that reconstruction for referential opacity (i.e. world-variable binding) is impossible in this case. In light of the availability of such reconstruction in (9b), what blocks reconstruction for referential opacity in (9c) must be that such reconstruction induces Condition C connectivity. Put differently, the reason that reconstruction for referential opacity is impossible in (9c) is because it would give rise to a fatal Condition C violation. Correspondingly, such reconstruction is possible in (9b) precisely because Condition C is not at issue in this case.

This conclusion has an important ramification: while we saw above that Condition C is independent of reconstruction for quantifier scope in Hindi, (9) reveals that Condition C does correlate with reconstruction for referential opacity. This conclusion aligns with Sharvit's (1998) and Lechner's (2013, to appear) claims about reconstruction in English (not discussed here for reasons of space). The picture that emerges from these considerations suggests that reconstruction effects do not necessarily travel together and, in particular, that there is not a simple relationship between reconstruction and Condition C connectivity. Certain types of reconstruction appear to coincide with Condition C connectivity, while others do not. A satisfactory account of the interpretive properties of Hindi long scrambling must therefore be flexible enough to allow mismatches where they are attested, but also be constrained enough to impose a systematic limitation on such mismatches. The next section explores the consequences of these empirical generalizations for the theory of reconstruction.

3. Analysis

We propose that Hindi long scrambling requires a hybrid account of reconstruction that comprises two independent mechanisms for reconstruction. We argue that a purely copy-theoretic account of reconstruction, whereby reconstruction invariably results from neglecting a higher copy, is insufficient as a comprehensive theory of reconstruction. Instead, we propose that reconstruction can be achieved by *either* higher-copy neglection *or* higher-type traces, as proposed on independent grounds by Lechner (1998, 2013, to appear).

3.1 Background: Higher-type traces

This section briefly reviews the higher-type trace account of scope reconstruction, which has been developed in depth by Cresti (1995) and Rullmann (1995). Canonically, the trace left behind by movement is translated into a type-e variable, which semantically causes the moved element to take scope in the landing site of movement. Cresti and Rullmann propose that the trace may also be translated into a type-$\langle et,t\rangle$ variable, which is the type of a generalized quantifier. In what follows, we use '$\mathcal{Q}$' to refer to a variable of this semantic type. A schematic sample derivation is given below in (10).

(10) [Someone from Minnesota] $\lambda\mathcal{Q}_{\langle et,t\rangle}$ [is likely [$\mathcal{Q}$ to win the lottery]]

a. $[\![$to win the lottery$]\!] = \lambda x_e\,.\,x$ wins the lottery

b. $[\![\mathcal{Q}$ to win the lottery$]\!] = \mathcal{Q}(\lambda x_e\,.\,x$ wins the lottery$)$

c. $[\![$is likely $\mathcal{Q}$ to win the lottery$]\!] = \textsc{likely}(\mathcal{Q}(\lambda x_e\,.\,x$ wins the lottery$))$

d. $[\![\lambda \mathcal{Q} \text{ is likely } \mathcal{Q} \text{ to win the lottery}]\!]$
$= \lambda \mathcal{Q}_{\langle et,t\rangle} \,.\, \textsc{likely}(\mathcal{Q}(\lambda x_e \,.\, x \text{ wins the lottery}))$

e. $[\![\text{someone from MN}]\!] = \lambda P_{et} \,.\, \exists x[x \text{ is from MN} \wedge P(x)]$

f. $[\![\text{someone from MN } \lambda \mathcal{Q} \text{ is likely } \mathcal{Q} \text{ to win the lottery}]\!]$
$= [\lambda \mathcal{Q}_{\langle et,t\rangle} \,.\, \textsc{likely}(\mathcal{Q}(\lambda x_e \,.\, x \text{ wins the lottery}))]([\![\text{someone from MN}]\!])$
$= \textsc{likely}([\![\text{someone from MN}]\!](\lambda x_e \,.\, x \text{ wins the lottery}))$
$= \textsc{likely}(\exists x[x \text{ is from MN} \wedge x \text{ wins the lottery}])$

Due to the higher semantic type of the variable in the trace position, (10) produces a narrow-scope interpretation of the moved constituent—and hence scope reconstruction—via purely semantic means. The crucial property of a higher-type trace account is that the moved element is interpreted in its *landing* site at LF. Thus, when the moved element contains an R-expression, that R-expression will not be in the domain of a coindexed pronoun that c–commands the launching site. Moreover, this kind of analysis could in principle be generalized to achieve other reconstruction effects by manipulating the semantic types of traces; this will be relevant below in section 3.6.

3.2 The insufficiency of nonhybrid accounts

Before proceeding to our proposal, it is instructive to consider the obstacles that the Hindi long-scrambling pattern poses for nonhybrid accounts of reconstruction. First, if higher-copy neglection were the only reconstruction mechanism (Romero 1997, 1998, Fox 1999), then scope reconstruction would universally correlate with Condition C connectivity. As we have seen, this is not the case in Hindi. A neglect-only account is therefore too restrictive. Second, an account where higher-type traces are the only reconstruction mechanism would not only disassociate Condition C from scope reconstruction, but from reconstruction for referential opacity as well. It is hence too permissive.[5]

3.3 Proposal

We propose that a principled account of Hindi long scrambling and its interpretation becomes available only if long scrambling may be interpreted *either* by neglecting the higher copy (11a) *or* by leaving a higher-type trace (11b), i.e. if both mechanisms are available. Furthermore, we propose that these are the only interpretation mechanisms available for interpreting long scrambling; in particular, leaving a type-*e* trace is impossible. Because both neglecting the higher copy and leaving a higher-type trace yield scope reconstruction, it follows that long scrambling never shifts scope (see (6)).

[5]Sternefeld (2001) and Ruys (2015) develop amended versions of the higher-type trace account of reconstruction, which derive a correlation between scope reconstruction and Condition C connectivity (albeit through stipulation), just like higher-copy neglection accounts. These accounts likewise do not extend to Hindi long scrambling and are thus too restrictive for the same reason as higher-copy neglection accounts.

(11) $\mathrm{DP}_1 \ldots \mathrm{Op} \ldots \underline{\quad}_1 \ldots$

long scr

a. *Neglecting the higher copy*
$[\ \cancel{\mathrm{DP}_1}\ [\ \ldots \mathrm{Op} \ldots \mathrm{DP}_1 \ldots\ ]\ ]$ $(\mathrm{Op} \gg \mathrm{DP}_1)$

b. *Leaving a higher-type trace*
$[\ \mathrm{DP}_1\ [\ \lambda\mathcal{Q}_{\langle et,t\rangle}\ [\ \ldots \mathrm{Op} \ldots \mathcal{Q}_{\langle et,t\rangle} \ldots\ ]\ ]\ ]$ $(\mathrm{Op} \gg \mathrm{DP}_1)$

We now turn to demonstrating that the coexistence of both mechanisms for reconstruction enables a principled account of the empirical generalizations about Hindi long scrambling from section 2.

3.4 Leaving a higher-type trace

As discussed above, one crucial distinction between leaving a higher-type trace and neglecting the higher-copy is that the latter induces Condition C connectivity, but the former does not. We saw on the basis of (8) that scope reconstruction in Hindi does not correlate with Condition C connectivity. Thus, while scope reconstruction can in principle be achieved by higher-copy neglection, this disassociation with Condition C indicates that this is not the only option. Under our proposal, scope reconstruction can crucially also be achieved by leaving a higher-type trace, as schematized in (12). In a Condition C configuration like (12), because the moved DP is interpreted in its landing site, the R-expression that it contains is not c-commanded by the coindexed pronoun c–commanding the launching site and hence no Condition C violation arises. The result is scope reconstruction without a Condition C violation, accounting for cases like (8).

(12) *Higher-type trace LF for (8)*
[**every book** that $\boxed{\mathrm{Ram}_1}$ likes]
[$\lambda\mathcal{Q}_{\langle et,t\rangle}$ [$\boxed{\mathrm{he}_1}$ told **some girl** [$_{\mathrm{CP}}$ that Mina had sold $\mathcal{Q}_{\langle et,t\rangle}$ yesterday]]]
$(\exists \gg \forall)$

Recall from the paradigm in (9) that Condition C connectivity does correlate with reconstruction for referential opacity, i.e. world-variable binding; this is why an opaque interpretation is blocked in (9c). Given that leaving a higher-type trace does not induce Condition C connectivity—as we saw for (12)—, the correlation between Condition C and reconstruction for world-variable binding in (9) reveals that higher-type traces must be unable to produce reconstruction for world-variable binding. For now, we will take this as an assumption, stated in (13), but we will suggest how it may be derived in section 3.6.

(13) Higher-type traces cannot produce reconstruction for world-variable binding.

In sum, higher-type traces yield reconstruction for quantificational scope, but not reconstruction for referential opacity (by (13)). Because leaving a higher-type trace does not give rise to Condition C connectivity, only scope reconstruction is independent of Condition C and hence not constrained by it.

3.5 Neglecting the higher copy

Higher-type traces alone are insufficient as an account of Hindi long scrambling. Recall from (9b) that reconstruction for world-variable binding *is* possible when Condition C is not at play. Long scrambling must therefore be able to produce such reconstruction, but only when evaluating Condition C in the launching site would not incur a Condition C violation. Because of the restriction in (13), it is clear that such reconstruction cannot be the result of higher-type traces. Therefore, under our proposal, such reconstruction must be produced by neglecting the higher copy, as schematized in (14); the arrow is for presentational purposes only and does not represent LF Lowering.

(14) *Higher-copy neglection LF for (9b)*
[$\underline{\underline{\lambda w_0}}$ [~~[DP a ghost in $w_{0/2}$ that loves him$_1$]~~
$\boxed{\text{Pratap}_1}$ thinks in w_0 [$\underline{\underline{\lambda w_2}}$ [that Sangita saw
[DP a ghost in $\underline{\underline{w_{0/2}}}$ that loves $\boxed{\text{him}_1}$]
in w_2]]]] (✓transparent; ✓opaque)

Neglecting the higher copy in (14) and interpreting the copy inside the embedded clause places, at LF, the moved DP within the scope of the λ-binder over worlds at the edge of the lower clause, allowing this binder to bind the world variable of the moved DP. Doing so yields an opaque interpretation with respect to the intensional predicate, as desired. The option of neglecting a higher copy therefore provides an explanation for why long scrambling allows reconstruction for world-variable binding. Crucially, because higher-copy neglection induces Condition C connectivity, it is unavailable in (9c), as illustrated in (15).

(15) *Illicit higher-copy neglection LF for (9c)*
*[$\underline{\underline{\lambda w_0}}$ [~~[DP a ghost in $w_{0/2}$ that loves Pratap$_1$]~~
$\boxed{\text{he}_1}$ thinks in w_0 [$\underline{\underline{\lambda w_2}}$ [that Sangita saw
[DP a ghost in $\underline{\underline{w_{0/2}}}$ that loves $\boxed{\text{Pratap}_1}$]
in w_2]]]] $\rightsquigarrow$ *violates Condition C*

In the presence of a Condition C effect in the launching site, e.g. in (9c), the only option for interpreting long scrambling is to leave a higher-type trace. As such a trace is unable to yield reconstruction for world-variable binding, per (13), only a transparent interpretation of the moved DP is possible in cases like (9c). This derives the observation that the availability of reconstruction for referential opacity correlates with Condition C connectivity.

3.6 Restricting higher-type traces

Higher-type traces must be blocked from producing reconstruction for world-variable binding. This restriction was stipulated in (13), but we may hope to derive it from more fundamental principles. Let us first consider what would be required to produce world-variable binding with a higher-type trace. One possible way is schematized in (16). Here, the higher-type trace is intensional (type $\langle s, \langle et, t\rangle\rangle$), and it combines with a world pronoun (w') that is bound by the λ-binder over worlds associated with the intensional predicate *think*. This LF has the effect that the world variable inside the moved element will be bound by the λ-binder associated with *think*; assuming that the NP is evaluated with respect to that world variable, it induces an opaque interpretation of the moved DP.

(16) *Higher-type trace LF for (9c) yielding opaque reading (to be ruled out)*
$[\ \mathrm{DP}_{\langle s,\langle et,t\rangle\rangle}\ [\ \lambda \mathcal{Q}_{\langle s,\langle et,t\rangle\rangle}\ [\ \ldots \text{ think } [\ \underline{\underline{\lambda w'}}\ [\ \ldots\ \mathcal{Q}_{\langle s,\langle et,t\rangle\rangle}(\underline{\underline{w'}})\ \ldots\ ]]]]]$

If (16) were possible, it would allow for reconstruction for world-variable binding that is independent of Condition C. In light of the Hindi evidence, (16) must be blocked.

Broadly speaking, higher-type traces can be blocked from producing reconstruction for world-variable binding if intensionality is represented with overt world (or situation) pronouns (Percus 2000) and the following two conditions in (17) hold.[6]

(17) a. The NP restrictor must be associated with a local world/situation pronoun.

b. World/situation pronouns cannot be λ-abstracted over within the DP.

The restrictions in (17) have the effect that the world variable of the NP is associated with a world pronoun that is never in the scope of a modal operator lower than the interpreted copy. Nor can that pronoun be abstracted over and then saturated with a world pronoun downstairs, analogous to (16). Consequently, the LF in (16) and others like it are ruled out. A higher-type trace LF for (9c) that obeys the restrictions in (17) is given in (18). Crucially, the NP-internal world pronoun can only be bound by the λ-binder at the edge of the matrix clause because that is the only world abstraction whose scope it is in. Thus, (18) is a well-formed LF, but the moved DP is necessarily construed transparently with respect to *think*.

(18) *Higher-type trace LF for (9c)*
$[\ \underline{\underline{\lambda w_0}}\ [_{\mathrm{DP}} \text{ a ghost in } \underline{\underline{w_{0/*2}}} \text{ that loves } \boxed{\text{Pratap}_1}\ ]$
$[\ \lambda \mathcal{Q}\ [\ \boxed{\text{he}_1} \text{ thinks in } w_0\ [\ \underline{\underline{\lambda w_2}}\ [\text{ that Sangita saw } \mathcal{Q}_{\langle et,t\rangle} \text{ in } w_2\ ]]]]]$
($\checkmark$*transparent; *opaque*)

The key takeaway from this discussion is that (17) prevents higher-type traces from producing reconstruction for world-variable binding. This in turn derives the restriction in (13). The availability of (18) as an LF for (9c), combined with the impossibility of an LF that neglects the higher copy (see (15)), derives the fact that (9c) is wellformed (i.e. there is no Condition C effect), but it only allows for a transparent interpretation.

There are a number of ways in which the crucial restrictions in (17) could be implemented. One proposal is due to Lechner (2013, to appear), who proposes restricting the permissible semantic types of determiners to those that are purely extensional. This restriction rules out quantificational DPs and traces of type $\langle s, \langle et, t\rangle\rangle$, but allows them to be

[6]We are indebted to Winnie Lechner for extremely helpful discussion of these issues and for leading our thinking towards the criteria in (17).

type $\langle et,t \rangle$, giving rise to the restrictions in (17). A second possibility is suggested by Keine & Poole (2018). Based on Schwarz (2012), they propose that determiners are intensional, and that they directly combine with a world pronoun that is subsequently fed into the NP restrictor. This account derives the restrictions in (17) too, but without committing us to only having extensional determiners. We do not discuss the differences between the two approaches here for reasons of space, but refer the reader to Keine & Poole (2018).

4. Conclusion

The standard approach to reconstruction—neglecting a higher copy—produces a correlation between scope reconstruction and Condition C connectivity. Romero (1997, 1998) and Fox (1999) argue that this correlation is desirable in light of data like (2). However, the Hindi data that we presented here indicate that this correlation is not universal. To the extent that the copy-theoretic account of reconstruction necessarily produces this correlation (as Romero and Fox argue), Hindi long scrambling suggests that not all reconstruction effects can be the result of neglecting a higher copy.

We presented two novel generalizations about reconstruction in Hindi long scrambling: (i) scope reconstruction does not correlate with Condition C connectivity and (ii) Condition C correlates with reconstruction for world-variable binding. We proposed that a comprehensive account of the Hindi reconstruction facts requires the hybrid account of reconstruction developed by Lechner (1998, 2013, to appear); these facts therefore provide novel support for this model. On this account, reconstruction can be achieved either by neglecting a higher copy or by interpreting the launching site as a higher-type variable. A summary of the two mechanisms of reconstruction and their empirical consequences is given in (19) and (20).

(19) *Neglecting the higher copy*
λw_0 $\cancel{[_{\text{DP}}\ w \text{ R-expr}_3\ ]}$ … $\text{pron}_{*3/4}$ … Op … λw_1 … $[_{\text{DP}}\ w_{0/1} \text{ R-expr}_3\ ]$

i. Reconstruction for world-variable binding possible

ii. Reconstruction for quantifier scope

iii. Condition C connectivity

(20) *Leaving a higher-type trace*
$\lambda w_0\ [_{\text{DP}}\ w_{0/*1} \text{ R-expr}_3\ ]\ \lambda \mathcal{Q}_{\langle et,t \rangle}$ … $\text{pron}_{3/4}$ … Op … λw_1 … $\mathcal{Q}_{\langle et,t \rangle}$

i. No reconstruction for world-variable binding

ii. Reconstruction for quantifier scope

iii. No Condition C connectivity

An important question that emerges is how the Hindi generalizations relate to Romero's (1997, 1998) and Fox's (1999) arguments that scope reconstruction correlates with Condition C in English. There are at least two possible ways in which the two could be reconciled. First, it is a priori possible that English does not allow for leaving a higher-type trace at all, unlike Hindi (see Poole 2017). Alternatively, it is possible that in English—like in Hindi—Condition C correlates only with reconstruction for world-variable binding, but because

Romero's (1997, 1998) and Fox's (1999) data did not control for intensionality, this pattern was masked. Sharvit (1998) provides evidence that supports the second option (see also Lechner 2013, to appear, Keine & Poole 2018). If so, then the properties of reconstruction in English and Hindi are considerably more similar than they initially appear.

References

Barss, Andrew. 1986. Chains and anaphoric dependence. Doctoral dissertation, MIT, Cambridge, MA.

Bošković, Željko, & Daiko Takahashi. 1998. Scrambling and last resort. *Linguistic Inquiry* 29:347–366.

Chomsky, Noam. 1976. Conditions on rules of grammar. *Linguistic Analysis* 2:303–351.

Chomsky, Noam. 1993. A minimalist program for linguistic theory. In *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, ed. Kenneth Hale & Samuel Jay Keyser, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Cinque, Guglielmo. 1990. *Types of A-bar dependencies*. Cambridge, MA: MIT Press.

Cresti, Diana. 1995. Extraction and reconstruction. *Natural Language Semantics* 3:79–122.

Dayal, Veneeta. 1994. Binding facts in Hindi and the scrambling phenomenon. In *Theoretical perspectives on word order in South Asian languages*, ed. Miriam Butt, Tracy Holloway King, & Gillian Ramchand, 237–262. Stanford: CSLI.

Engdahl, Elisabet. 1980. The syntax and semantics of questions in Swedish. Doctoral dissertation, University of Massachusetts, Amherst, MA.

Engdahl, Elisabet. 1986. *Constituent questions*. Dordrecht: D. Reidel Publishing Company.

Fox, Danny. 1999. Reconstruction, Binding Theory, and the interpretation of chains. *Linguistic Inquiry* 30:157–196.

Fox, Danny. 2002. Antecedent-contained deletion and the copy theory of movement. *Linguistic Inquiry* 33:63–96.

Frampton, John. 1999. The fine structure of wh-movement and the proper formulation of the ECP. *The Linguistic Review* 16:43–61.

Gurtu, Madhu. 1992. *Anaphoric relations in Hindi and English*. New Delhi: Munshiram Manoharlal.

Heycock, Caroline. 1995. Asymmetries in reconstruction. *Linguistic Inquiry* 26:547–570.

Keine, Stefan, & Ethan Poole. 2018. Not all reconstruction effects are syntactic. Ms., University of Southern California and University of California, Los Angeles.

Kidwai, Ayesha. 2000. *XP-adjunction in Universal Grammar: Scrambling and binding in Hindi-Urdu*. Oxford: Oxford University Press.

Kroch, Anthony. 1989. Amount quantification, referentiality, and long *wh*-movement. Ms., UPenn.

Lebeaux, David. 1990. Relative clauses, licensing, and the nature of the derivation. In *Proceedings of the 20th Meeting of the North East Linguistic Society*, ed. Juli Carter, Rose-Marie Dechaine, Bill Philip, & Tim Sherer, 318–332. Amherst, MA: GLSA.

Lebeaux, David. 2009. *Where does Binding Theory apply?*. Cambridge, MA: MIT Press.

Lechner, Winfried. 1998. Two kinds of reconstruction. *Studia Linguistica* 52:276–310.

Lechner, Winfried. 2013. Diagnosing covert movement: The Duke of York and reconstruction. In *Diagnosing syntax*, ed. Lisa Cheng & Norbert Corver, 158–189. Oxford: Oxford University Press.

Lechner, Winfried. to appear. A calculus for reconstruction and anti-reconstruction. In *Reconstruction effects in relative clauses*, ed. Mathias Schenner & Manfred Krifka. Berlin: Akademie Verlag.

Mahajan, Anoop. 1990. The A/A-bar distinction and movement theory. Doctoral dissertation, MIT, Cambridge, MA.

May, Robert. 1985. *Logical Form*. Cambridge, MA: MIT Press.

Percus, Orin. 2000. Constraints on some other variables in syntax. *Natural Language Semantics* 8:173–229.

Poole, Ethan. 2017. Movement and the semantic type of traces. Doctoral dissertation, University of Massachusetts, Amherst, MA.

Romero, Maribel. 1997. The correlation between scope reconstruction and connectivity effects. In *Proceedings of the Sixteenth West Coast Conference on Formal Linguistics*, ed. Emily Curtis, James Lyle, & Gabriel Webster, 351–366. Stanford: CSLI Publications.

Romero, Maribel. 1998. Focus and reconstruction effects in *wh*-phrases. Doctoral dissertation, University of Massachusetts, Amherst, MA.

Rullmann, Hotze. 1995. Maximality in the semantics of *wh*-constructions. Doctoral dissertation, University of Massachusetts, Amherst, MA.

Ruys, Eddy. 2015. A minimalist condition on semantic reconstruction. *Linguistic Inquiry* 46:453–488.

Saito, Mamoru. 2004. Japanese scrambling in a comparative perspective. In *Peripheries: Syntactic edges and their effects*, ed. David Adger, Cécile de Cat, & George Tsoulas, 143–163. Dordrecht: Kluwer.

Sauerland, Uli. 1998. The meaning of chains. Doctoral dissertation, MIT, Cambridge, MA.

Sauerland, Uli. 2004. The interpretation of traces. *Natural Language Semantics* 12:63–127.

Sauerland, Uli, & Paul Elbourne. 2002. Total reconstruction, PF movement, and derivational order. *Linguistic Inquiry* 33:283–319.

Schwarz, Florian. 2012. Situation pronouns in determiner phrases. *Natural Language Semantics* 20:431–475.

Sharvit, Yael. 1998. *How-many* questions and attitude verbs. Ms., UPenn.

Sportiche, Dominique. 2006. Reconstruction, binding, and scope. In *The Blackwell companion to syntax, vol. IV*, ed. Martin Everaert & Henk van Riemsdijk, 35–93. Oxford: Blackwell.

Sportiche, Dominique. 2016. Neglect. Ms. University of California, Los Angeles.

Sternefeld, Wolfgang. 2001. Syntactic vs. semantic reconstruction. In *Linguistic form and its computation*, ed. Christian Rohrer, Antje Roßdeutscher, & Hans Kamp, 145–182. Stanford: CSLI.

Stefan Keine, Ethan Poole
keine@usc.edu, epoole@ucla.edu