



Semantic Reconstruction and the Interpretation of Chains^{*}

E. G. Ruys

UiL-OTS, Utrecht University

E.G.Ruys@uu.nl

Abstract. This paper explains three known constraints on scope reconstruction – reconstruction is blocked into *wh*-islands, after remnant movement, and after countercyclic merge – by postulating an underlying condition on semantic reconstruction, which follows naturally from minimalist assumptions on chain formation in combination with the principle of compositionality.

1 Introduction

In scope reconstruction, a moved element takes scope at, or close to the position it occupied before the movement. Consider (1):

- (1) someone_i is likely [_{TP} t_i to arrive]
- a. there is some person *x* s.t. it is likely that *x* arrives
 - b. it is likely that there is some person *x* s.t. *x* arrives

This sentence allows the surface-scope reading (1a), and the reconstructed reading (1b), where *someone* seems to be interpreted in the position it occupied prior to Raising to Subject.

A major question discussed in the literature on scope reconstruction is whether it should be dealt with by syntactic or semantic means. May's (1977) solution for (1b) was syntactic: at LF, *someone* optionally undergoes a movement operation (Quantifier Lowering) that lowers it into the scope of *likely*. However, lowering movement is not otherwise attested and generally assumed to be impossible. Chomsky's (1993) copy theory of movement made a less problematic syntactic treatment available. On this theory, A-movement creates the structure in (2). Only one copy of *someone* must be retained at each of the interface levels PF and LF; deleting or ignoring the higher copy at LF, as in (2a), will yield the narrow scope, reconstructed reading.

- (2) someone is likely [_{TP} someone to arrive]

^{*} I am grateful to Eefje Boef, Ora Matushansky, and audiences at SuB15 and the Utrecht Syntax Circle for comments and discussion. Naturally, all errors are my own.

- a. ~~someone~~ is likely [_{TP} someone to arrive]
 b. someone is likely [_{TP} ~~someone~~ to arrive]

The semantic treatment of scope reconstruction was made prominent by Cresti (1995), Rullmann (1995), and others. Such a treatment proceeds on the assumption that the syntactic representation invariably has *someone* in its surface position (or higher). The reconstructed reading can be derived by postulating that the trace left by movement can function not only as an e-type variable (which yields the surface scope reading, as shown in (3a)) but also as a variable of the type of a generalized quantifier. In this case, function-argument relations are reversed, and the result is the interpretation (3b) in which *likely* in effect scopes over *someone*.¹

- (3) someone_i is likely [_{TP} t_i to arrive]
 a. someone (λx_i [likely(\wedge arrive(x_i))]) t_i is x of type e
 b. (\wedge someone) λX_i [likely(\wedge X_i(arrive))] t_i is X of type <s,<<e,t>, t>>
 = likely(\wedge someone(arrive))

The comparison of syntactic and semantic approaches to scope reconstruction in the literature has focused on which approach is better able to account for the interaction between scope reconstruction and reconstruction for binding theory, a topic I will touch on in section 5. In this article I want to provide support for the semantic approach with evidence of a different type. I want to apply to scope reconstruction the same strategy that was employed in evaluating the syntactic and semantic treatments of upward scope shift (Quantifier Raising): I will argue that several constraints on when scope reconstruction can and cannot take place, are best explained by one natural condition on semantic reconstruction. If this account is successful, it constitutes an argument in favor of the semantic approach.

The empirical material comes from three previously observed constraints on scope reconstruction. Longobardi (1987) observed that a wh-phrase extracted out of a wh-island does not reconstruct into the island. Barss (1986) showed that extraction followed by remnant movement does not reconstruct. Several authors have observed that late merger blocks scope reconstruction.

For each of these constraints, various explanations are available in the literature. So far, however, no unified account of the phenomena has been

¹ Assume, for concreteness, that a GQ-type variable is always intensionalized (type <s,<<e,t>,t>>), and composition can always add \wedge and \cdot when necessary (see Cresti 1995:fn 16). I will attempt to abstract away from this issue in my presentation.

proposed. The present paper proposes that they reflect a more general underlying constraint: semantic reconstruction of a DP into a trace position is possible only if it can be locally determined that the DP and the trace are identical. I will argue in the next section that this constraint makes perfect sense given a semantic approach to reconstruction. Absent an equally plausible syntactic rationale for such a constraint, it provides an argument for semantic reconstruction.

The remainder of this paper is organized as follows. Section 2 explains the constraint on semantic reconstruction I propose, and its relation to the interpretation of chains. Sections 3, 4, and 5 discuss the freezing effects induced by *wh*-islands, remnant movement, and late merger, respectively.

2 On the Interpretation of Chains

This section states the condition on scope reconstruction I propose, and shows how a rationale can be provided for it on the basis of the copy theory of movement and the semantic approach to reconstruction.

I assume the copy theory of movement, which is the standard in current syntactic theory. At the same time, I adopt the semantic approach to reconstruction. That is, I assume that the downstairs copy of a movement chain is always interpreted as a variable; reconstruction is achieved by manipulating its type. Let us consider what is required in order to interpret a movement chain under these assumptions. First of all, we need to obtain a variable in the place of the downstairs (struck-out) copy of the moved element. Secondly, we need to bind this variable from the landing site. Thirdly, we need to fix the type of this variable. I will deal with the two less crucial questions first.

Consider (4), the syntactic representation the copy theory derives for a simple case of A-movement:

(4) [_{TP} some man [_T T [_{VP} arrived ~~some man~~]]]

How do we obtain a variable at the foot of the movement chain? One option is to replace the struck-out copy of *some man* with a variable, or with a larger expression containing a variable (as does the Trace Conversion rule of Fox 2002:67). However, since such a move is at odds with Chomsky's (1995:225) Inclusiveness Condition, which provides the conceptual motivation for the copy theory, I will assume that traces are not replaced with variables or subject to any kind of trace conversion. A struck-out copy simply *is* a variable. Technically, what this means is that LF structures are interpreted relative to assignment functions which are defined as functions from syntactic

constituents to entities in the domain. Semantic composition in (4) proceeds in a bottom-up manner, starting from *man*. When the DP node dominating *some man* is reached, it is somehow discovered that this DP is a movement trace (exactly how is a technical question for the copy theory that is not particular to my proposal; assume for concreteness that the presence of unchecked uninterpretable features (Case in (4)) indicates that the element is (part of) a trace). Therefore, what composes with 'arrived' is not the regular semantic value ($\lambda X \exists x[\text{man}'(x) \wedge X(x)]$) computed so far; this is discarded in favor of $g([\text{DP some man}])$ (g the current assignment function).

The next step in interpreting a movement chain is to bind the variable from the landing site. In pre-minimalist syntax, which provided indexed variables at the foot of a movement chain, it was standard to assume that the sister of a moved element XP_i is interpreted via lambda-abstraction over the variable with index i . The implementation in Cresti (1995) (based on Heim 1993, among others) converted the index on the moved element into a separate syntactic node, as shown in (5):

- (5) $[\text{TP [some man]} [\text{T}'_2 i [\text{T}'_1 [\text{VP arrived} [\text{NP } t]_i]]]]$

This allows for interpretation by familiar means: the index identifies the variable to be abstracted over, and triggers the semantic abstraction rule. There is, however, no syntactic evidence for the operation deriving (5), and it is at odds with the minimalist goal of doing away with indices. I therefore prefer to move the necessary complications into the composition rule for movement derived structures. The proposal is stated informally in (6):

- (6) Given a structure $[\text{HP } A \ B]$, where B has been the target of internal merge due to a relation of Attract between the label of B and a constituent D , $\llbracket \text{HP} \rrbracket^g$ is obtained by composing $\llbracket A \rrbracket^g$ with that function h s.t. for every d , $h(d) = \llbracket B \rrbracket^{g[D/d]}$.

This tells us to interpret the TP in (4) w.r.t. assignment g by composing $\llbracket \text{some man} \rrbracket^g$ with the function h s.t. for every d , $h(d) = \llbracket [\text{T}' arrived } \text{some man}] \rrbracket^{g[\text{some man}/d]}$.

The simple methods I have described for obtaining a variable at the foot of the chain, and for binding it, do not appear to be crucial for the treatment of scope reconstruction phenomena I want to propose. If the reader prefers, (s)he may assume instead, for instance, that a hidden morpheme is affixed to a struck-out copy which functions to replace it with a variable, which is then bound in the manner of (5). I would find this less elegant, but it would not necessarily be incompatible with the constraint on scope reconstruction proposed below.

(which we just interpreted, before deciding to discard it and replace it with a variable) but the principle of compositionality does not allow us to make the interpretation of \bar{D} dependent on the interpretation of some distinct A somewhere higher up in the structure. Hence, in this case, \bar{D} defaults to the lowest type (e). The other case in which we cannot pick all possible types of D for \bar{D} is when A is outside the local domain of \bar{D} . Assuming that interpretation proceeds phase-by-phase (Chomsky 2000, 2001), we cannot "see A " at the point where we are interpreting D if A is not in the same phase as D , but in some higher phase. In this case, we do not know whether the expression resulting from λ -binding \bar{D} will eventually compose with an A identical to D , hence we must again default to the lowest type (e).

In sum, we can pick a higher type for a variable, resulting in semantic scope reconstruction, just in case $A=D$ and we can determine locally that $A=D$. This constraint is stated informally in (8).³

- (8) If D is a trace then D is interpreted as a variable of some type τ . If D is attracted to a phase-accessible target B , and D is identical to the sister of B , then τ can be the type of any non-trace interpretation of D . Alternatively, τ can default to the lowest type compatible with the category of D .

I have argued that this constraint follows naturally from the interaction of standard minimalist assumptions and the principle of compositionality. In the next three sections, I will show how it applies to the data.

3 Why *wh*-Islands Block Scope Reconstruction

This section discusses the scope freezing effect found in island constructions. Consider (9) and (10):

³ A formal implementation of (8) of course presupposes an implementation of Semantic Reconstruction. This is not entirely routine. Existing implementations (Cresti 1995, Rullmann 1995) create a syntactic ambiguity by postulating different traces that translate as variables of different types. In a copy theory, the same effect could be achieved by enriching a trace copy with a diacritic that marks its type; this would also, technically, remove the remaining tension between the compositionality principle and (8). But these are clearly coding tricks: there is no independent evidence that a moved DP can leave traces with different properties and indices. I agree with Rullmann (p. 177) that the complication is best moved into the interpretation rule. However, if we are to avoid representationalism, this presupposes a semantic treatment of traces as untyped variables. This can be done by making the type of a variable depend on the assignment function, and then letting the interpretation of an expression be defined only relative to assignment functions that treat the variable as being of the desired type. I must leave this issue for another occasion.

In (12) *how many people* moves through the edge of every phase (CP, vP), presumably attracted by a P-feature inserted for this purpose (see Chomsky 2001). As a result, each trace has a local antecedent, hence can be type <et,t> by (8). In (13), the embedded Spec,CP is filled, so that the underlined trace cannot assess the type of the constituent that composes with its binder, which is two phases up. It therefore defaults to type e.⁴

I feel my treatment of these data is a slight improvement over earlier treatments. First, because it provides a local restatement of (11), with a rationale that makes it less stipulative than Cresti's filter. But more importantly, because the treatment extends to the scope freezing effects of remnant movement and late merger, which I discuss in the next two sections. No such extension seems possible for existing accounts of (10).

However, my account differs slightly in its empirical predictions from other implementations of (11). On the one hand, it shares the success of (11) and Cresti's implementation in accounting for the absence of other types of "higher order" readings for elements extracted from wh-islands. E.g., (14) does not allow the functional reading for *which book* paraphrased in (14a), where the trace is arguably a function-type variable:

- (14) which book do you wonder whether every man dislikes t
 a. *for which function f mapping men to a book, do you wonder whether every man x dislikes f(x) [his oldest, his cheapest, ...]

See Cresti (1995) for discussion. On the other hand, Cresti's implementation covers only filled Spec,CP islands, and does not extend to other weak islands that block reconstruction, such as negative islands. (15) is from Rullmann (1995:198):

- (15) a. How many books was John able to read?
 b. How many books was John not able to read?

(15a) allows reconstruction, but (15b) has only the wide scope reading for *n-many books*. Rullmann proposes a semantic account in terms of maximality

⁴ The question arises how (13) can be derived at all. If the wh-phrase does not move through the edge of CP, it is not clear that it can be attracted by the next phase head, given Chomsky's (2000) PIC; but if it does, then why does it not leave a trace in spec,CP, which will then be local to the trace inside the island? One possible solution is suggested by Sabel (2002): the embedded C attracts *how many people* to a (second) specifier, but this does generate a violation (English +wh C does not tolerate a specifier containing a trace). Hence, the trace in spec,CP is *-marked. The trace is subsequently deleted (as in Chomsky and Lasnik 1993), resulting in only a weak (subjacency level) violation. I will assume that some such solution is possible.

(which, in turn, does not extend to *wh*-islands); whether my account can cover (15) depends on whether *NegP* can be argued to delimit a local context (see Sabel 2002 for some discussion and references).

On the down side, Cresti implements Frampton's generalization more precisely than (8) does by requiring all traces in the offending configuration to be type *e*, not just *DP*-traces. This entails that adjuncts cannot be extracted from *wh*-islands at all, since they cannot bind *e*-type variables. My implementation could be adjusted to entail the same prediction: rephrase (8) so that a trace without a local antecedent does not default to the lowest type compatible with its category, but to type *e*. On the other hand, the prediction is not correct for all adjuncts, as discussed in Rullmann (1995). I will leave this issue for further research.

4 Why Remnant Movement Blocks Reconstruction

As (17) shows, *A*-movement out of a structure that is subsequently fronted does not reconstruct into the fronted constituent.

- (16) some politician_i is [_{AP} likely [_{IP} t_i to address every rally]]
- for some politician *x*: it is likely *x* addresses every rally
 - it is likely that for some politician *x*: *x* addresses every rally
 - it is likely that for every rally *y*: for some politician *x*: *x* addresses *y*
- (17) [_{AP} how likely [_{IP} t_i to address every rally]] is some politician_i t_{AP} ?
- for which *d*, for some politician *x*: it is *d*-likely *x* will address every rally
 - *for which *d*, it is *d*-likely that for some politician *x*: *x* will address every rally
 - *for which *d*, it is *d*-likely that for every rally *y*: some politician *x*: *x* will address *y*

Whereas (16) allows both wide scope and narrow scope relative to *likely* for *some politician* (and, optionally, relative to *every rally* as well, following local QR of the latter), (17) allows only the wide scope reading roughly paraphrased in (17a), as observed by Barss (1986). Barss' explanation, based on a Quantifier Lowering theory of reconstruction, was that QL can only move straight down (into a *c*-commanded position), not sideward and down.

An explanation more in line with current understanding of movement phenomena was proposed by Sauerland (1999), Sauerland & Elbourne (2002) (q.v. for discussion of Barss' work). *A*-movement can take place either in syntax, or in the PF branch (provided that this yields an additional scope option); it does not reconstruct. Wide scope in (16) is the result of *A*-

movement in syntax feeding into LF. Narrow scope results from PF A-movement, with the pre-movement structure feeding into LF. Given some further assumptions, this approach to A-movement reconstruction predicts the freezing effect in (17), where A-movement is followed by A-bar-movement. Since A-bar-movement must take place in syntax, so must any A-movement preceding it; this yields the wide-scope reading.

There are several problems with this explanation. First, since the account of reconstruction applies only to reconstruction from A-movement, it does not explain why A-bar-movement also fails to reconstruct after remnant movement, as observed by Sauerland. More seriously, the analysis predicts that (under the right conditions) any A-moved element should be able to behave for all syntactic purposes (e.g. ECP effects, superiority, NPI licensing) as though it had not moved. There is no evidence that this is correct. Finally, details of the analysis aside, the explanation does not of course extend to the scope freezing effects in *wh*-islands and after late merger discussed in sections 3 and 5.

Sauerland & Elbourne (2002) do present the data in (18) as independent evidence for their theory.

- (18) a. *?[Which constraint]_i are [good examples of t_i]_j always provided t_j?
 b. [Which constraint]_i are [good examples of t_i]_j always sought t_j?
- (19) 2x good examples of this constraint are always provided

They argue that (18b) fails to violate the Subject Condition that rules out (18a) because the object can delay raising to subject to PF, as this will allow it to remain in the scope of the intensional verb. However, the ambiguity of (19) shows that the presence of the quantificational adverb in (18a) should also be enough to license PF-movement. While I do not have an account for the contrast in (18), it does not appear to support Sauerland & Elbourne's theory of A-movement reconstruction.

Turning to my analysis, consider the abstract structure (20):

- (20) [CP [XP ... t_i ...] [C' C [TP NP_i ... ~~XP~~]]]

On a semantic approach to reconstruction, we must interpret the top copy of XP. The bottom copy only contributes a variable. Whether NP reconstructs therefore hinges on the type assigned to its trace(s) in the top XP. Since the head of the NP chain does not c-command into the top XP, the λ -binder of the highest of these traces (if there is a λ -binder at all) must compose with something not identical to NP. (8) therefore blocks reconstruction, explaining Barss' observation.

Before we can make this analysis of (17) more concrete, we need to deal with a serious complication. The NP trace in the fronted copy of XP is unbound. On a syntactic reconstruction approach, this is not a problem: XP moves back down at LF, or we delete the upstairs copy of XP and retain the downstairs copy, and the trace becomes properly bound. But on the semantic reconstruction approach, we must interpret the top copy of XP, so we cannot avoid ending up with an unbound variable. This does not yield a correct interpretation. The phenomenon of remnant movement as such creates a serious problem, not just for my proposal, but for the entire semantic approach to reconstruction.

For a concrete illustration of the problem, and of the solution I propose, I will focus on some structurally simpler examples, from Huang (1993):

- (21) a. [$\sqrt{\text{VP}}\ t_i$ love himself], John_i never will $t_{\sqrt{\text{VP}}}$
 b. [$\sqrt{\text{VP}}\ t_i$ admire Stalin], noone_i did $t_{\sqrt{\text{VP}}}$

Huang proposed that the reconstruction effect in (21a), by which *himself* is licensed despite VP-fronting, is explained by the VP-internal Subject Hypothesis, which causes the VP to contain a trace of *John* that A-binds the anaphor. But how is the trace itself bound? Examples like (21b) show that the VP-internal trace must be able to function as a bound variable. The obvious solution is to invoke reconstruction. As noted, syntactic reconstruction solves the problem. On standard assumptions, however, semantic reconstruction is not able to produce the bound reading. We obtain for (21b) the (defective) interpretation in (22a), rather than the desired (22b).

- (22) a. (admire(x, stalin)) λp_t [noone ($\lambda x.p$)]
 b. noone ($\lambda x.admire(x, stalin)$)

It is important to note that this problem exists independently of the proposed constraint on scope reconstruction. Quite generally, the apparent impossibility of deriving a meaning for (21a) or (21b) without syntactic reconstruction might be taken as damning evidence against any (exclusively) semantic approach to reconstruction. This problem – how to make a semantic reconstruction theory deal with constituents containing a variable, when they have been moved out of the scope of the variable’s binder – has been addressed before. Sternefeld (2001) (q.v. for further references) proposes a solution in which traces are interpreted as variables over functions from assignment functions to normal denotations. It appears that this system might support a solution for scope freezing in (17) as well, although not in the way Sternefeld develops it. While the issue is mostly outside the scope of this

paper, I will sketch an alternative (partial) solution which fits better with the treatment of chains I am proposing.

The first possibility is to start from these assumptions: that any displaced element functions as a phase (as suggested by one of Chomsky's (2000) diagnostics for phases), and that an XP that is extracted out of a phase must first move into its edge. We can now propose the derivation (23) for (21b):

- (23) [_{VP} *noone* admire Stalin] [_{C'} **noone** [_{T'} did [_{VP} *noone* [_{VP} *noone* admire Stalin]]]]]
 a. $\lambda x_e [x \text{ admire Stalin}] \lambda X_{\langle e, t \rangle} [C' \text{ noone } \lambda x [T' [\text{VP } \underline{x} X]]]$
 b. $(\lambda x_e [\text{admire}(x, \text{Stalin})]) \lambda X_{\langle e, t \rangle} [C' \text{ noone } (\lambda x [\text{VP } X(\underline{x})])]$

Noone first attaches to the vP phase, and then moves to Spec,TP. Subsequently, the lower segment of vP moves to Spec,CP, leaving the underlined trace and stranding the doubly underlined trace. The fronted vP now does not contain a free variable, because it is a movement target subject to the abstraction rule (6); it can undergo semantic reconstruction and then apply to the variable that is the doubly underlined trace of *noone*. (23a) schematically indicates how different traces function; (23b) clarifies the function-argument relations. The result is equivalent to (22b) by lambda-conversion.

Scope freezing falls out as desired. (24) is from Huang (1993):

- (24) [_{VP} *t_i* see everyone]_i, (I am sure) someone_j did $\exists > \forall, * \forall > \exists$

Everyone in (24) cannot scope over *someone*, which indicates that *someone* does not reconstruct, as per Barss' generalization. The full structure is given in (25a):

- (25) a. [_{CP} [_{VP} *someone* see everyone] [_{C'} **someone** did [_{VP} *someone* [_{VP} *someone* see everyone]]]]]
 b. [_{CP} λx_e [_{VP} *x_e* see everyone] $\lambda X_{\langle e, t \rangle} [C' \text{ someone } \lambda x_e [T' \text{ did } [\text{VP } \underline{x} X]]]]]$

The boldfaced *someone* in (25a) cannot reconstruct. The lambda binder of the italicized trace (at the top of the fronted vP) does not compose with the “antecedent” of the italicized trace (the doubly underlined trace), but with the C'. Hence, (8) causes the italicized trace to default to type e; the result is (25b). The rationale is that one would need to inspect the semantics of the C'

to determine that, indirectly, the types would match for any possible type of *someone*. The considerations of compositionality built into (8) prevent this.⁵

This solution does not require any new semantic assumptions, but the syntactic assumptions are not unproblematic. First of all, it is unclear why the subject must move to Spec,vP (and how it can), given that it is already in the edge of the vP-phase. One possible answer is, that this movement step is needed precisely because the vP will otherwise contain a free variable after it is fronted. Another option is that what is fronted in VP-fronting is a constituent slightly bigger than vP (cf. Huang 1993); this constituent functions as a phase when it fronts, so that the subject must move through its edge. Another potential problem is that the analysis requires fronting of a segment of vP. Again, we may speculate that segment movement is allowed here, perhaps exceptionally, because fronting the complete category will front a free variable.

An alternative would be to implement essentially the same solution by manipulating the semantics. Assume that any fronted constituent containing traces in its edge will undergo “lambda-closure”: all free traces in the edge are abstracted over in some fixed order. The terminal trace of the fronted constituent is raised in type accordingly, and then fed the same variables as arguments. This will also deal with cases where more than one element is extracted before remnant movement, although the syntactic treatment can be adapted to such cases as well. For reasons of space, I must leave an exploration of these options for another occasion.

5 Why Late Merger Blocks Scope Reconstruction

It has repeatedly been observed (Fox 1999, Fox & Nissenbaum 1999, Bhatt & Pancheva 2004) that counter-cyclic merger blocks scope reconstruction of the XP merged into. Consider just one example (from Fox & Nissenbaum 1999):

(26) I looked for [A a picture] very intensely [B a picture] by this artist
 $\exists > \textit{look for}, * \textit{look for} > \exists$

Fox & Nissenbaum derive extraposition in (26) via movement of *a picture*, creating the chain (B, A), followed by late merger of the PP into B. A is

⁵ The underlined trace may start out as type *e*, but also as type $\langle et, t \rangle$, because it has a local antecedent (the doubly underlined trace). This means, that the vP trace starts out as ambiguous between types $\langle e, t \rangle$ and type $\langle \langle et, t \rangle, t \rangle$ (those are the types of its “non-trace interpretations” in (8), so both those types are allowed for the vP trace as a variable). But the upstairs copy of the vP can only be type $\langle e, t \rangle$ (because the italicized trace cannot be $\langle et, t \rangle$). This leaves only $\langle e, t \rangle$ as an option for the vP trace, as the higher type will lead to a mismatch.

realized at PF, but only B can be interpreted at LF: the countercyclic merger blocks the reconstructed reading. A syntactic theory of scope reconstruction along the lines of (2a) easily explains why: deleting B would leave the PP modifier dangling. On a semantic theory of scope reconstruction, the effect is unexpected, but it is explained by (8): the λ -binder of the variable A composes with a non-identical DP, so the variable defaults to type e. Fox's (1999) analysis of the correlation between reconstruction for scope and binding can be captured in this way, as well. I must defer discussion of these and related cases to another occasion.

6 Conclusions

I have argued that three constraints on scope reconstruction, which thus far had not received a satisfactory or unified explanation, follow naturally from one underlying condition on reconstruction. While this condition depends on the copy theory of movement (Chomsky 1993), it also relies crucially on the semantic approach to scope reconstruction (Cresti 1995, Rullmann 1995).

Further evidence might be found in the absence of scope reconstruction into Parasitic Gaps and in *tough* constructions. Further research is also needed into reconstruction in A-chains, and in the relation to Kennedy's puzzle, among other topics.

References

- Barss, A. 1986. *Chains and Anaphoric Dependence*. PhD diss., MIT.
- Bhatt, Rajesh, and Roumyana Pancheva. 2004. Late merge of degree clauses. *Linguistic Inquiry* 35. 1–45.
- Chomsky, Noam. 1993. A minimalist program for linguistic theory. Reprinted in Chomsky (1995).
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, Massachusetts: MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: the framework. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by Roger Martin, David Michaels and Juan Uriagereka. Cambridge, Mass.: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: a Life in Language*, ed. by Michael Kenstowicz. 1–52. Cambridge, Mass.: MIT Press.
- Chomsky, Noam, and Howard Lasnik. 1993. The theory of principles and parameters. Reprinted in Chomsky (1995).

- Cresti, Diana. 1995. Extraction and reconstruction. *Natural Language Semantics* 3. 79–122.
- Fox, Danny. 1999. Reconstruction, variable binding, 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.
- Fox, Danny & Jon Nissenbaum. 1999. Extraposition and scope: a case for overt QR. In *WCCFL 18: Proceedings of the 18th West Coast Conference on Formal Linguistics*, ed. by Sonya F. Bird, Andrew Carnie, Jason D. Haugen and Peter Norquest. 132–144. Somerville, Massachusetts: Cascadilla Press.
- Frampton, John. 1999. The fine structure of wh-movement and the proper formulation of the ECP. *The Linguistic Review* 16-1. 43–61.
- Heim, Irene. 1993. Anaphora and Semantic Interpretation: A Reinterpretation of Reinhart's Approach. SfS-Report 07-93, Tübingen Working Papers, University of Tübingen.
- Huang, C.-T. James. 1993. Reconstruction and the structure of VP: Some theoretical consequences. *Linguistic Inquiry* 24. 103–138.
- Longobardi, Giuseppe. 1987. Extraction from NP and the proper notion of head government. In *The syntax of noun phrases*, ed. Alessandra Giorgi and Giuseppe Longobardi. 57–112. Cambridge: Cambridge University Press
- May, Robert. 1977. *The Grammar of Quantification*, doctoral dissertation, MIT, Cambridge, Massachusetts.
- Rullman, Hotze. 1995. *Maximality in the semantics of wh-constructions*. Doctoral dissertation, MIT, Cambridge, Mass.
- Sabel, Joachim. 2002. A minimalist analysis of syntactic islands. *The Linguistic Review* 19. 271–315.
- Sauerland, Uli. 1999. Scope Reconstruction without Reconstruction. *WCCFL* 17. 582–596.
- Sauerland, Uli & Paul Elbourne 2002. Total Reconstruction, PF Movement, and Derivational Order. *Linguistic Inquiry*, Vol. 33, No. 2. 283–319.
- Sternefeld, Wolfgang. 2001. Semantic vs. Syntactic Reconstruction. In H. Kamp, A. Rossdeutscher & Ch. Rohrer (eds.), *Linguistic Form and its Computation*. CSLI Publications Stanford, CA, pp. 145–182.