Explaining Barss's generalization

HANS VAN DE KOOT

Abstract

This paper argues that reconstruction for scope and reconstruction for syntactic dependencies such as binding and predication do not always go hand in hand. This is unexpected under the 'copy theory of reconstruction' (Chomsky 1993, 1995, Hornstein 1995, Fox 1999, and many others), according to which reconstruction phenomena are mediated by copies of moved constituents at LF. I explore an alternative account based on the contrast between relations that exhibit the identifying characteristics of syntactic encoding (Koster 1987, Neeleman and Van de Koot 2002) and those that do not. Of the former, a subclass *must* undergo reconstruction for syntactic properties, but this is not necessarily accompanied by reconstruction for scope. Scope reconstruction *optionally* applies to any element that is scope-sensitive, including those that have failed to undergo syntactic reconstruction. The constraints on syntactic reconstruction follow from the effects of Inclusiveness on the formation of syntactic dependencies; the constraints on scope reconstruction are partly determined by the availability of target sites (a matter of syntax) and partly by scope-specific constraints.

1 Introduction

Syntactic theories of reconstruction seem to be converging on what I will call the copy theory of reconstruction (see Chomsky 1993, 1995, Hornstein 1995, Lebeaux 1998, Fox 1999, and many others). Its proponents argue that, given Inclusiveness, movement must leave copies (or involve multiple merger of the same lexical material) and that reconstruction is a uniform process mediated by these copies.

It has long been known that there are cases where this expectation of uniformity is not met. For example, Chomsky (1995: 327) discusses the failure of reconstruction of *him* in (1), giving rise to a Principle B violation.

(1) *John$_1$ expected [him$_1$ to seem to me [$_\alpha$ t_1 to be intelligent]]

Such examples have sparked a debate about whether there is reconstruction in A-chains at all (see, for example, Lebeaux 1998, Lasnik 1999, Boeckx 2001, and Sauerland and Elbourne 2002). These authors do not interpret the special properties of A-chains as evidence against the claim that reconstruction is uniform. Rather, failure of reconstruction in such chains is argued to follow from independent factors. For example, Lebeaux (1998) proposes that positions in A-chains need not

always contain a full copy of the moved element, while Boeckx (2001) claims that copies in an A-chains not 'active' for reconstruction have not had their case feature eliminated. In this paper I challenge the assumption that reconstruction is uniform by considering cases where reconstruction asymmetries are manifested in one and the same structure.

Our point of departure is the observation, due to Barss (1986), that reconstruction in an A-chain cannot target a position contained in another reconstruction site. Sauerland and Elbourne (2002) dub this Barss's Generalization and formulate it as in (2), where 'total reconstruction' means reconstruction of all the material contained in a QP.

(2) *Barss's Generalization*
Total reconstruction of an A-moved QP to a position X is blocked when the QP does not c-command X in the overt form.

Section 2 introduces the facts that establish this generalization and discusses two recent accounts of it that assume a version of the copy theory of reconstruction. I argue that these proposals are unsatisfactory in their own right but also that they overlook the fact that the opacity of copies is only partial: the internal structure of copies is inaccessible for scope reconstruction but transparent for syntactic relations such as binding and θ-marking.

Section 3 develops the proposal, defended in detail in Neeleman and Van de Koot 2002, that movement relations – along with a number of other dependencies – are syntactically encoded, as opposed to established by syntax-external mechanisms (compare Brody 1998).

Section 4 returns to Barss's generalization and shows that the minimalist theory of grammatical dependencies of section 3 entails that syntactic reconstruction and scope reconstruction cannot be the same process. In particular, scope relations cannot be directly represented in the syntax because a syntactic encoding of movement that satisfies Inclusiveness is incompatible with the assumption that traces are full copies. I then argue that, if traces do indeed lack internal structure, the null hypothesis about how LF representations are interpreted by scope principles is sufficient to explain why the trace of A'-movement.

Section 5 provides further justification for the proposals of section 4 by considering several further asymmetries between syntactic reconstruction and scope reconstruction, thus strengthening the case for treating these as distinct phenomena.

Section 6 brings together the main conclusions of this paper.

2 Barss's generalization

2.1 A reconstruction riddle

That scope reconstruction is possible in A-chains is, to my mind, convincingly demonstrated by facts such as those in (3) (May 1979, Lebeaux 1998). In (3a), *some young lady* may be interpreted in the scope of *every senator*; (3b) and (3c) show that this is not due to long QR of *every senator*. In (3b) the binding relation with the reciprocal prevents *some young lady* from undergoing lowering, while in (3b) this indefinite is embedded in a PP and is prevented from lowering for that reason. In both cases the scope-reconstructed reading is lost.

(3) a. Some young lady$_1$ seems [t_1 to be likely [t_1 to dance with every senator]]
(i) some > every; (ii) every > some

b. Some young lady$_1$ seems to herself$_1$ [t_1 to be likely [t_1 to dance with every senator]]
(i) some > every; (ii) *every > some

c. Mary seems to some young lady$_1$ [t_1 to be likely [t_1 to dance with every senator]]
(i) some > every; (ii) *every > some

Barss (1986) observes that the scope-reconstructed reading of such sentences also disappears if the predicate containing the trace of the indefinite undergoes WH-movement:

(4) [How likely t_1 to dance with every senator]$_2$ does [some young lady]$_1$ seem to be t_2?
(i) some > likely/every; (ii) *likely/every > some

Sauerland and Elbourne (2002) give further examples that display the same pattern, of which I discuss here the licensing of *any* through reconstruction under negation. In (5a), the A-moved NPI can reconstruct to a position in the scope of negation. However, this is no longer possible if the embedded predicate is fronted, as in (5a'). As shown by the pair in (5b,b'), such fronting is fine if the stranded A-moved constituent is not dependent on any material in the fronted constituent.

(5) a. A doctor with any reputation was certain *(not) to be available.
a'. *. . . and [certain not to be t_1 available]$_2$ [a doctor with any reputation]$_1$ was t_2.
b. A doctor from cardiology was certain (not) to be available.

b'. . . . and [certain not to be t_1 available]$_2$ [a doctor from cardiology]$_1$ was t_2.

How should these fact be accounted for? In the remainder of this section I discuss two recent accounts of Barss's generalization and argue that neither is successful.

2.2 Explanation 1: *How* is a degree expression blocking reconstruction

Boeckx (2001) argues that lowerable quantifiers in A-chains (those that may undergo total reconstruction) are precisely those that can appear in *there*-sentences. The data below (Boeckx's (59) and (60)) illustrate this correlation.

(6) a. Someone from New York is likely to win the lottery.
someone > likely; likely > someone
a'. There is someone in the garden.
b. Nobody is believed to be in the reactor room.
nobody > believed; believed > nobody
b'. There is nobody in the garden.
c. Exactly one person is likely to get an offer.
exactly one > likely; likely > exactly one
c'. There is exactly one person in the garden.
d. Every coin is likely to land heads.
every > likely; *likely > every
d'. *There is everybody in the garden.

His analysis of total reconstruction capitalizes on this observation by attributing it to the covert, acyclic insertion of an expletive (*there*$_{LF}$), followed by lowering of the indefinite. In other words, total reconstruction is exactly the opposite of expletive replacement.

With this proposal in place, Boeckx accounts for the contrast between (3a) and (4) by linking the unavailability of the reconstructed reading in (4) to the ungrammaticality of (7).

(7) *There is 30% likely to be a man in the garden.

This example suggests that a degree expression acts as an intervener for expletive-associate relations. Since *how* is a degree expression as well, it could be taken to interfere with the covert expletive-associate relation required for total reconstruction of the indefinite in (4), as illustrated below:

(8) *[How likely t_1 to address every rally]$_2$ is *there*$_{LF}$ [how likely [*some politician*] to address every rally]

This proposal suffers from a number of weaknesses.

First, the analysis is based on the claim that the quantifiers that may undergo total reconstruction are precisely those that can appear in *there*-sentences. While that may be true, it begs the question why (6a-c) do not themselves allow a *there*-expletive in the overt syntax:

(9) a. *There is likely someone from New York to win the lottery.
b. *There is nobody believed to be in the reactor room.
c. *There is likely exactly one person to get an offer.

Second, it is unclear how the insertion of *there*$_{LF}$ can be reconciled with Full Interpretation. Following Chomsky (1995), we may assume that the overt variant of *there* is a pure expletive, containing nothing but the categorial feature D (in addition to its phonological features). This feature is checked in the course of the overt syntax, so that the expletive is invisible at LF, as required by Full Interpretation. But *there*$_{LF}$ cannot contain a D-feature. If it did, it would fail to be checked and a violation of Full Interpretation would ensue. But then what features *could* it contain?

Third, why would covert insertion of *there*$_{LF}$ trigger lowering of the associated indefinite? Expletives are sometimes conceptualized as LF-affixes: elements that must somehow be supported at LF by the feature content of their associate. This support takes the form of LF-raising of the entire associate (or of feature-attraction in more recent approaches to covert relations). To put it differently: the expletive lacks something that the associate supplies. This fairly intuitive view of expletives is at odds with the proposal that such elements could trigger lowering of their associates. An alternative account of associate-lowering that assumes the lowering process to be triggered by something in the lowering site seems too implausible to require consideration.

Fourth, examples like those in (10a,b) suggest that a universal *can* sometimes be lowered. But of course universals cannot be associated with an expletive (see (10a',b')).

(10) a. Every Londoner is likely to receive a £10.- tax rebate.
(i) every Londoner > likely; (ii) likely > every Londoner
a'. *There is likely every Londoner to receive a £10.- tax rebate.
b. [Each of his$_1$ many problems]$_2$ seems to [every student]$_1$ t_2 to be caused by laziness.

b'. *There seems to every student each of his many problems to be caused by laziness.

The ambiguity of (10a) could perhaps be explained away by insisting that the narrow scope reading of the universal entails the wide scope reading. Hence, there would be no need for a structure expressing the narrow scope variant. But this line of argumentation does not affect (10b), where lowering is required for the bound variable reading of *his*. This reading cannot be the result of QR of *every student*, as that should give rise to a crossover violation, as shown by the examples in (11).

(11) a. *[His$_1$ many financial problems] hampered [every student]$_1$
b. *[Its$_1$ many problems] doomed [every new model the company developed]$_1$

Fifth, the assumption that *how* acts as an intervener is problematic. The bare adjective *likely* has a high degree interpretation. As has often been observed (see Sapir 1944, Bresnan 1973, and many others), in *John is tall*, John is tall to a high degree; the sentence cannot be used if John is in fact short. This fact by itself would lead one to expect that bare adjectives should also give rise to intervention effects for expletive-associate relations. But this is of course not correct:

(12) There is likely to be a salesman at the door.

In the context of Boeckx's proposal, the grammaticality of (12) gives rise to two further predictions. The bare adjective *likely* should not block covert expletive insertion with associated lowering of the indefinite. This is confirmed by the ambiguity of (3a), repeated here, which must allow covert lowering of *some young lady* in order to yield narrow scope for the existential after clause-bound QR of *every senator*.

(3a) Some young lady$_1$ seems [t_1 to be likely [t_1 to dance with every senator]]
(i) some > every; (ii) every > some

Furthermore, preposing of *likely to dance with every senator rally* should leave the narrow scope reading of the indefinite unaffected. But this seems not to be the case. The failure of the stranded indefinite in (13) to reconstruct into the fronted constituent mirrors the ungrammaticality of (5a'), in which the stranded NPI fails to take scope under negation.

(13) And [likely t_1 to dance with every senator]$_2$ [some young lady]$_1$ seems to be t_2.
(i) some > likely/every; (ii) *likely/every > some

The same problem is highlighted by the observation that the degree expressions *more* and *very*, which do not interfere with expletive-associate chains either, do interfere with the scope-reconstructed reading when predicate-fronting applies. Consider first the examples in (14), involving *more*.

(14) a. There is more likely to be a salesman at the door than a postman.
b. Some young lady is more likely [t_1 to dance with every senator] than some octogenarian.
(i) some > every; (ii) every > some
c. And more likely to dance with every senator than some octogenarian some young lady definitely is.
(i) some > likely/every; (ii) *likely/every > some

(14a) demonstrates that *more*, unlike *3%*, does not interfere with expletive-associate relations. As predicted by the LF-expletive account, this degree expression does not block lowering of an indefinite, so that (14b) is ambiguous. However, (14c) – in which the raising predicate has been fronted – lacks the narrow scope reading for the indefinite. The same pattern is displayed by comparable sentences with *very*:

(15) a. There is very likely to be a salesman at the door.
b. Some young lady is very likely to dance with every senator.
(i) some > likely/every; (ii) likely/every > some
c. And very likely to dance with every senator some young lady definitely is.
(i) some > likely/every; (ii) *likely/every > some

Since a question involving *how* asks the addressee for a degree, its semantics must be less specified than that of any individual degree expression (see Neeleman, Van de Koot and Doetjes 2004 for extensive discussion of the semantics of degree expressions):

(16) a. How likely is John to win?

b. 3% likely.
As likely as Bill.
More likely than Bill.
Very likely.
Too likely to my taste.

But if the semantics of *how* is that weak, then it can no longer be understood why it should block expletive-associate relations, given that the more specified degree expressions *more* and *very* do not.

Finally, when predicates containing the trace of passivization undergo fronting, they display exactly the same pattern we found with preposed raising predicates:

(17) a. At least one card was signed t_1 by every student.
one > every ; every > one
b. [Signed t_1 by every student]$_2$ [at least one card]$_1$ was t_2
one > every; *every > one

However, the ungrammaticality of (17b) cannot be attributed to an intervention effect.

In summary, I have given six arguments against an explanation of Barss's generalization in terms of covert predicate-lowering with associated intervention effects. Four of these were related to aspects of the lowering analysis and two to the claim that *how* is an intervener for LF-lowering.

2.3 Explanation 2: It's all a matter of timing

An alternative account of Barss's Generalization has been based on the hypothesis that the lowered reading of indefinites does not involve reconstruction or lowering at all but results from PF-movement of the indefinite (Sauerland and Elbourne 2002). According to this proposal, overt movement of an indefinite may either take place in the narrow syntax (stem-movement) or in the PF branch of the grammar. These two alternative derivations are illustrated below for (18a), a simplified variant of (3a).

(18) a. Some politician is likely to address every rally.
Stem-movement:
PF: [some politician] is likely [~~some politician~~] to address every rally.
LF: [some politician] is likely [~~some politician~~] to address every rally.
some > likely/every

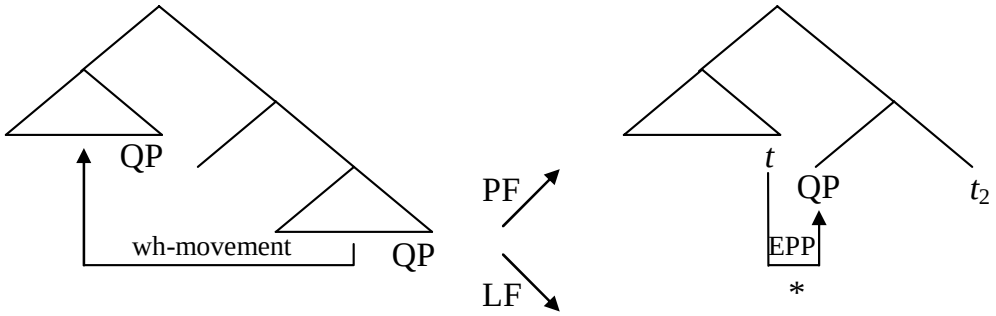
b. PF-movement:
PF: [some politician] is likely [~~some politician~~] to address every rally.
LF: is likely [some politician] to address every rally.
likely/every > some

Before we consider the merits of this proposal, let us see how it is intended to capture Barss's Generalization. The wide scope reading of the indefinite in (19a) is derived in the usual way, without PF movement, as in (19b) (the stem-movement of the auxiliary is not shown). The failing derivation for the narrow scope reading is given in (19c).

(19) a. [How likely t_1 to address every rally]$_2$ is [some politician]$_1$ t_2?
b. Stem-movement:
[some politician] is [how likely [~~some politician~~] to address every rally]
Stem-movement:
[how likely [~~some politician~~] to address every rally] is [some politician] ~~is~~ [~~how likely~~ [~~some politician~~] ~~to address every rally~~]
c. Stem-movement:
[how likely [some politician] to address every rally] is ~~is~~ [~~how likely~~ [~~some politician~~] ~~to address every rally~~]
PF-movement:
*[how likely [~~some politician~~] to address every rally] is [some politician] ~~is~~ [~~how likely~~ [~~some politician~~] ~~to address every rally~~]

Why does the derivation in (19c) fail? WH-movement never allows total reconstruction (the WH-operator must be interpreted in specCP) and hence must involve stem-movement. Such movement precedes all movements in the LF and PF branches of the grammar, so that it must precede the delayed movement of *some politician*. Finally, since the PF-derivation obeys its own version of the strict cycle, this delayed movement must apply to the copy of *some politician* contained in the moved WH-phrase. But this implies that the movement of this constituent to the specifier of IP is an instance of lowering, leaving a trace that cannot be licensed under c-command. This is further illustrated by the tree representations in (20) (Sauerland and Elbourne's (48)).

(20)



This proposal is unsatisfactory for a number of reasons.

First, if total reconstruction is not reconstruction at all, but lack of raising, then it should not exhibit any intervention effects. This prediction is incorrect. Consider reconstruction of binominal *each*. The data in (21) show that *each* must be in the scope of a distributive DP at LF (this observation is due to Burzio 1981, 1986; the data are from Sauerland and Elbourne 2002).

(21) a. [One translator each]$_1$ is likely to *t'*$_1$ be assigned t_1 to the athletes.
b. The Olympic Committee assigned one translator each to the athletes.
c. *[One translator each]$_1$ is likely to t_1 to give a speech to the athletes.

As the following examples make clear, reconstruction of *one translator each* is sensitive to the presence of negation:[1]

(22) a. *[One translator each]$_1$ is unlikely to *t'*$_1$ be assigned t_1 to the athletes.
b. *[One translator each]$_1$ is not likely to *t'*$_1$ be assigned t_1 to the athletes.
c. *[One translator each]$_1$ is likely not to *t'*$_1$ be assigned t_1 to the athletes.

---

[1]Boeckx (2001) claims that total reconstruction is sensitive to intervening quantifiers on the basis of examples such as (i), which he claims do not have a narrow scope reading for the indefinite.

(i) A red car seems to every driver to be parked at the corner.

If this were correct, we would never expect an indefinite to scope under a universal in raising environments. But an example like (ii), taken from Fox 1999, shows that this *is* possible:

(ii) [Someone from his$_1$ class]$_2$ seems to every professor$_1$ [t_2 to be a genius].

someone > every; every > someone

Crucially, the narrow scope of the indefinite cannot be attributed to QR of the universal, as that would give rise to a weak crossover violation (compare the ungrammaticality of (iii); see also the discussion surrounding (10a,b) above).

(iii)*Someone from his$_1$ class loves [every professor]$_1$.

Second, the authors assume that PF-movement is constrained by (23), but this condition is incompatible with other aspects of the proposed analysis.

(23) Overt Movement of XP can be delayed until PF only if there is a scope-taking element Y such that XP takes scope over Y if movement takes place in the stem but below Y if movement is delayed until PF, and if these two scopal construals are semantically distinct.

If it holds, total reconstruction of the indefinite in (24a), and especially of the NPI contained in it, can no longer be catered for. The point is that *any reputation* does not seem to have a free choice reading in this environment, as suggested by the ungrammaticality of (24b), indicating that the indefinite in which it is contained must reconstruct.

(24) a. Mary believed [a doctor with any reputation] to be unlikely t_1 to be available
b. *Mary believed [a doctor with any reputation] to be likely t_1 to be available

On the account we are considering apparent reconstruction is really delayed overt movement. However, (23) only allows such movement if stem movement of the same phrase gives rise to an alternative scopal construal. We must therefore conclude that (23) is incorrect: PF-movement of the indefinite must be allowed even it does not yield a semantically distinct scopal construal.

But if (23) is withdrawn, then the question arises how one can account for the complete ungrammaticality of (25), which should allow PF-movement of *himself*, thereby avoiding a Principle C violation at LF (see Lebeaux 1998 for discussion of similar data).

(25) *Mary believed himself$_1$ to seem to John$_1$ [t_1 to be quite clever]

All in all, the problems with the PF-movement analysis of total reconstruction seem to me sufficiently severe to warrant its rejection. But then we must also reject the account of Barss's Generalization that is based on it.

2.4 The riddle revisited

The proposals just discussed – and indeed Barss's Generalization itself – ignore an important aspect of the reconstruction data. Consider once again example (4), repeated here.

(4) [How likely t_1 to dance with every senator]$_2$ does [some young lady]$_1$ seem to be t_2?
(i) some > likely/every; (ii) *likely/every > some

While *some young lady* cannot be reconstructed in the scope of *every senator*, it can be assigned the external θ-role of *dance*. Similarly, the stranded subject can bind an anaphor in the fronted constituent:

(26) [How likely t_1 to perjure himself]$_2$ does [every politician]$_1$ seem to be t_2?

Why should it be the case that the internal structure of a copy left by A'-movement is opaque for scope reconstruction but not for reconstruction of other properties? Under the copy theory of reconstruction this state of affairs is contradictory. On the one hand, we must assume that the WH-phrase reconstructs (or leaves a full copy); otherwise *every politician* in (26) cannot be related to the predicate contained in it (and in doing so also license the anaphor). On the other hand, we must assume that the stranded subject in (4) (like that in (26)) cannot reconstruct into the reconstructed WH-phrase or that, if it does, it can somehow not be accessed by scope principles. In the remainder of this paper I will argue that the explanation for this reconstruction asymmetry can be found in a minimalist reappraisal of the theory of grammatical dependencies.[2]

---

[2]This conundrum could perhaps partly be understood in terms of Lasnik and Saito's (1992) suggestion that *likely* is ambiguous: it sometimes behaves like a raising predicate and sometimes like a control predicate. If it behaves like a control predicate when fronted, then the questions about the thematic licensing of *some young lady* in (4) and the binding of the anaphor in (26) dissolve. The indefinite in (4) would simply not originate in the fronted constituent, which would instead contain a controlled PRO. The same empty category would also be the binder of the anaphor in (26).

However, apart from the stipulative nature of this suggestion, there are two overriding objections to it. As was noted earlier (see (17)), fronted predicates containing the trace of passivization display the same pattern we found with preposed raising predicates. Obviously, Lasnik and Saito's proposal cannot be extended to data of this type. Furthermore, pace Hornstein 1995, control structures do not seem to be incompatible with scope inversion, so that the failure of reconstruction in (4) remains unexplained:

(i) Some young lady$_1$ tried [PRO$_1$ to dance with every senator]
some > every; every > some

(ii) At least one young lady$_1$ tried [PRO$_1$ to dance with every senator]
at least one > every; every > at least one

See also Sauerland (1999) for extensive discussion of the inadequacy of Lasnik and Saito's proposal.

3 A minimalist theory of grammatical dependencies
3.1 Bare phrase structure

X'-theory imposes two constraints on the flow of information in syntactic representations that are absent in earlier context-free base rules. First of all, it stipulates that the categorial feature of a nonterminal node be recoverable from the structure it dominates by insisting that the category that occurs in the left-hand side of a rewrite rule recur in its right-hand side. To put it differently, it stipulates a variant of Inclusiveness that holds only for categorial features.

(27) *X'-Theory*
$XP \rightarrow \ldots X' \ldots$
$X' \rightarrow \ldots X^0 \ldots$
$X \in \{N, V, A, P, \ldots\}$

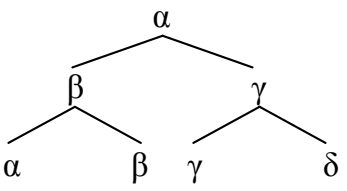
Because this restricted version of Inclusiveness is formalized in terms of a set of rewrite rules, a second property of categorial projection is captured as well: it applies under direct domination.

The principle of Inclusiveness generalizes the X'-theoretic 'recoverability' condition on categorial features to every syntactic feature. If this principle is assumed to hold uniformly of each node in a tree structure, then it can be understood as saying that the properties of any nonterminal node must be copied from nodes in the substructure of which it forms the root.

(28) *Inclusiveness*
The syntactic properties of a nonterminal node are fully recoverable from the structure it dominates; the syntactic properties of a terminal node are fully recoverable from the lexicon.

If Inclusiveness were the only constraint on phrase structure, however, it would allow discontinuous projection: the structure in (29) is ungrammatical, even though it satisfies Inclusiveness.

(29)



This indicates that, as in X'-theory, inheritance of categorial features must be restricted to direct domination. Chomsky (1995) achieves this by restricting merger so that label selection takes place under direct domination:

(30) *Merge*
The structure formed from combining α and β is {γ,{α, β}}, where γ is either α or β.

However, in the best case, direct domination – like Inclusiveness itself – should generalize to the copying of any feature. For this reason, Neeleman and Van de Koot (2002) adopt the following generalized direct domination condition:

(31) *Accessibility*
Relations between nodes require immediate domination.

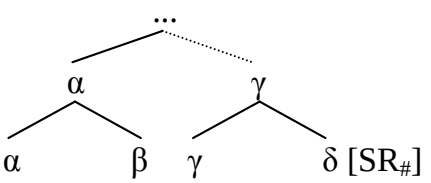
The resulting theory of bare phrase structure is the complete generalization of the conditions on categorial features embodied in X'-theory to every feature type in the grammar.

3.2 Encoding syntactic dependencies in bare phrase structure

Accessibility and Inclusiveness have far-reaching consequences for the syntax of dependencies: these constraints rule out *any* syntactic encoding of a chain-like dependency. (By 'syntactic encoding' I mean that the existence of a dependency is syntactically represented in the tree.)

Consider the structure in (32), where δ is a dependent element (an element requiring an antecedent of some sort). For concreteness, assume that δ carries a selectional requirement SR that is satisfied by the c-commanding constituent α (for ease of exposition, satisfaction of SR is indicated by '#'). Inclusiveness allows δ to carry SR as a lexical property. However, in violation of this principle, the fact that SR is satisfied cannot be determined by inspection of the internal structure of δ. Since α does not directly dominate δ, or vice versa, the dependency between these nodes violates Accessibility as well.

(32)

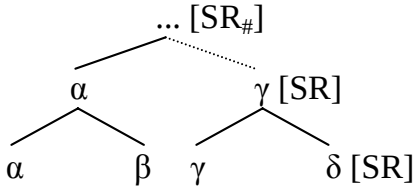


That the properties of a dependent element are indeed changed by the relation it enters into seems uncontroversial for any chain-like dependency and is most obvious from the fact that a dependent ceases to be dependent once it has found an antecedent. Consequently, a dependent cannot be associated with more than one antecedent. This uniqueness requirement is illustrated for anaphoric binding in (33), but holds quite generally (see Koster 1987 and Neeleman and Van de Koot 2002 for further discussion).

(33) a. John$_1$ told Mary about himself$_1$.
b. John told Mary$_1$ about herself$_1$.
c. *John$_1$ told Mary$_2$ about themselves$_{1+2}$.
d. *John$_1$ told Mary$_2$ about each other$_{1+2}$.

The problems with Accessibility and Inclusiveness can be overcome by copying the selectional requirement of a dependent element until it directly dominates its argument. In (34), SR is repeatedly copied, always under direct domination. Satisfaction of SR also applies under direct domination, so that Accessibility is adhered to throughout. Every occurrence of SR is recoverable from the structure it dominates (for a nonterminal node) or from the lexicon (for δ). The satisfaction of SR on the root node is recoverable from the structure it dominates (namely from its relation to α). Therefore, (34) respects Inclusiveness as well.

(34)



Space does not permit me to discuss all the consequences of this proposal, but one that is particularly attractive is that the properties of copying and satisfaction – which themselves follow from Inclusiveness and Accessibility – explain why syntactic dependencies obey c-command.

The direction of copying is always upward: downward copying transfers information to a node that cannot be recovered from the structure it dominates, in violation of Inclusiveness. Because copying transfers information from one node to another, it may apply recursively. Hence, the upward trajectory of a function is in principle unbounded.

By contrast, satisfaction of a selectional requirement SR is always downward. Upward application of SR in node α causes α to have a noninclusive property: the satisfied status of SR cannot be recovered from the structure α dominates. Unlike copying, satisfaction does not transfer information. It can therefore not apply

recursively. This means that Accessibility restricts satisfaction of SR to 'one step down'.

These properties of copying and satisfaction taken together explain the generalization that the antecedent in a syntactic dependency invariably c-commands the dependent element.

4 Explaining Barss's generalization

4.1 Movement and syntactic reconstruction

Since Inclusiveness requires the syntactic properties of terminals to be fully recoverable from the lexicon, selectional requirements must originate there as well. Hence, the lexical entry for an anaphor contains a binding requirement. Following Neeleman and Van de Koot 2002 I will henceforth refer to such lexical requirements as (syntactic) functions. The idea that an anaphor introduces a (binding) function seems straightforward. But how should we deal with the selectional requirements of traces?

As is well-known, A'-traces inherit all the syntactic properties of their antecedent. For example, in the by now familiar example (4), repeated below, *some young lady* is assigned the external θ-role of *dance*. Hence, the external θ-function of this verb must be available in the trace of the preposed constituent *how likely to dance with every senator*.

(4) [How likely t_1 to dance with every senator]$_2$ does [some young lady]$_1$ seem to be t_2?

This property of A'-movement is captured transparently by the standard copy theory. However, the view that traces are full copies cannot be reconciled with Inclusiveness and Accessibility.

Consider the consequences for Inclusiveness first. The lower copy would have to introduce a function, say f_{move}, that represents its dependent nature, but there is no terminal in the lower copy that carries this function as a lexical property. The function also cannot be introduced on the nonterminal that is the top node of the lower copy, because here, too, its presence would not be recoverable. The conclusion we must draw is that an A'-trace cannot have a lexical entry.

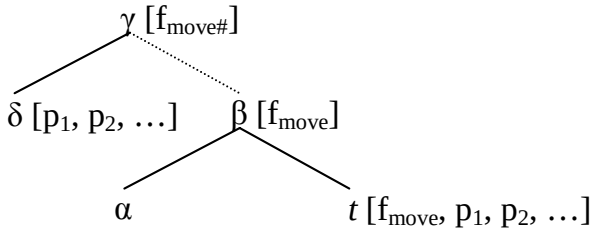
The copy theory is also incompatible with Accessibility. If f_{move} must look for a full copy of the trace, then it must be able to determine that every part of the lower copy is present in the higher copy. This implies that Accessibility must be violated whenever the moved element has internal structure.

In conclusion, both Inclusiveness and Accessibility require that the trace of movement has no internal structure. For this reason, Neeleman and Van de Koot develop a theory of syntactic reconstruction that does not rely on the copy theory.

An alternative characterization of A'-traces is suggested by theories that take a lexical entry to be a (mini-)mapping rule that associates minimal syntactic, semantic and phonological representations (Halle & Marantz 1993, Jackendoff 1997). On this view, a syntactic terminal is related to syntactic, phonological and semantic matrices via a 'lexical address'.

We concluded earlier that A'-traces are not listed in the lexicon. If this is correct, then they also lack a lexical address. But in order to comply with Inclusiveness, the properties of an A'-trace must be recoverable from the lexicon (in the system assumed here this means through mapping). This problem can be resolved if an addressless trace introduces a function that recovers an address from a syntactic antecedent. Thus, the properties of the A'-trace *t* in (35) are generated on *t* independently and licensed on this terminal through the satisfaction of f_{move}. This function associates *t* with the address of δ. As a result, the properties of *t* are licensed via the address supplied by δ. In other words, f_{move} causes reconstruction of syntactic properties.

(35)



Neeleman and Van de Koot argue that economy considerations dictate that a function have a unique effect on the environment in which it occurs. For example, if a function is input to copying, then it cannot simultaneously be the input to function application. The effect of a function that undergoes reconstruction is that it motivates the presence of the reconstructed function on a trace. It follows that the function in the antecedent can have no other effects and is therefore inert. The combined effect of economy and Inclusiveness is to make syntactic reconstruction obligatory: Inclusiveness requires that the trace be associated with an address (so that functions in the antecedent are reconstructed to the trace) and economy determines that the functions that are input to reconstruction have no other effects (so that only the reconstructed copy of a function can have an effect).

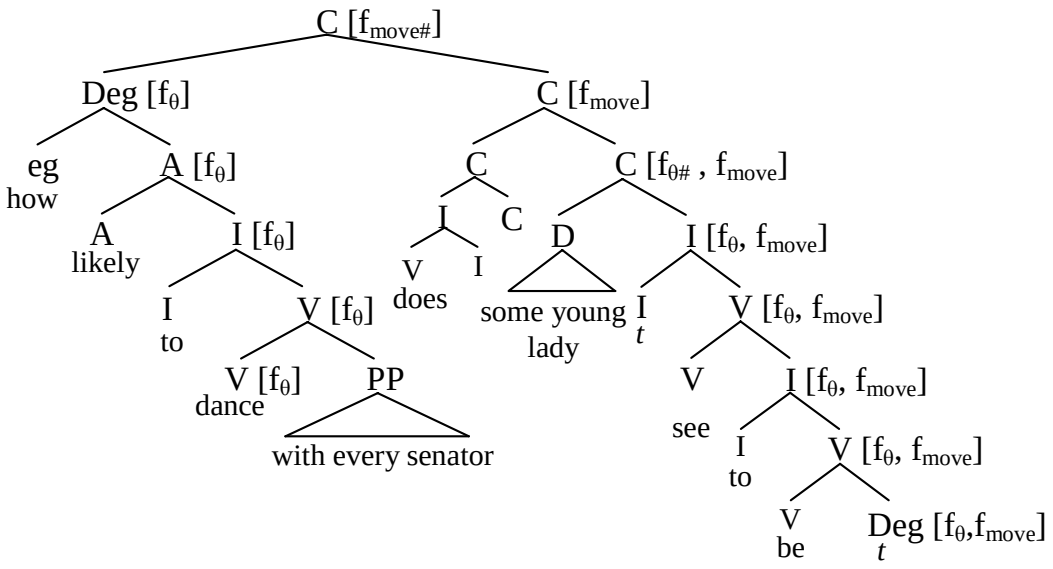
To account for the presence of f_{move} on the A'-trace, Neeleman and Van de Koot assume the Move Introduction rule in (36), which corresponds to Move-α in GB theory and Form-chain in minimalism. The presence of f_{move} in the trace is

reconciled with Inclusiveness if this rule is sensitive to the absence of a lexical address:

(36) *Move Introduction* : [Address: –] → {$_{\text{Node}}$ ..., f_{move}, ...}

Let us apply this theory of A'-dependencies to example (4) and consider how *some young lady* can be θ-marked by *dance*. For ease of presentation, the structure in (37) only shows the path of the function f_{move} introduced by the trace of *how likely to dance with every senator* and that of the external theta function of *dance*. Internally to the antecedent the external theta function f_θ of *dance* is copied upward in search of a suitable antecedent.[3] The function f_{move} introduced by the A'-trace is similarly copied upward until it reaches the root node and is satisfied by the preposed Deg constituent. This results in reconstruction of the θ-function in this node, which must therefore appear on the A'-trace. From there it is copied up until it directly dominates the argument *some young lady* and is satisfied by it.

(37)

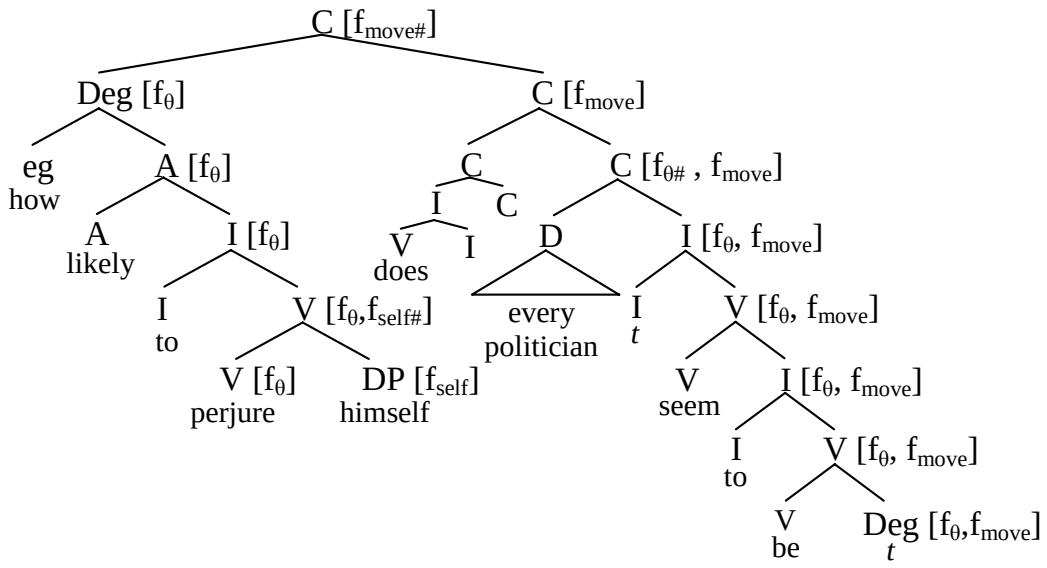


The reconstruction of the anaphoric properties of *himself* in example (26) is achieved in much the same way as the reconstruction of in f_θ (37) if it is assumed that its antecedent is the DP *every politician*. However, if its antecedent is a θ-role (see Williams 1986, 1994 and Neeleman and Van de Koot 2002), then it can be

[3]It may well be that this antecedent contains a trace of A-movement. For reasons to be discussed in section 5.5, this does not substantially alter the process of syntactic reconstruction illustrated here.

satisfied internally to the preposed constituent, as shown in (38) (again only relevant functions are shown).

(38)



Crucially, this theory achieves syntactic reconstruction of the predication relation and of binding without reconstruction of a full copy containing the relevant predicate or anaphor. It is this aspect of the proposal that provides the key to an alternative account of Barss's generalization.

4.2 Movement and scope reconstruction

Since f_{move} does not reconstruct – and indeed cannot access – the internal structure of constituents, it cannot act as a vehicle for scope reconstruction. This type of reconstruction must therefore be a distinct, post-syntactic phenomenon (section 5 reviews further evidence supporting this view). Of course, any theory of scope must take the structure of LF as the main determinant of available scope relations. The strongest such theory insists that scope rules cannot generate or destroy syntactic structure:

(39) Scope rules cannot create or destroy syntactic structure.

While (39) allows scope rules to interpret a constituent in a lower chain position, it prevents them from literally lowering a constituent. The result is akin to Barss's (1986) chain binding approach, but applied exclusively to scope (see also Aoun and

Li 1989, 1993). Crucially, (39) prevents a quantifier from undergoing scope reconstruction into a constituent that is not in its command domain.[4] Hence, given (39), the scope properties of the structure in (37) follow without further ado. Assume, for the sake of argument, that the maximal scope of *every senator* in (37) is the preposed Deg constituent. Since the internal structure of this constituent is not present in the c-command domain of *some young lady*, the indefinite cannot reconstruct into it and therefore cannot take narrower scope than the universal.[5]

Note that this proposal does not prevent the universal in (38) from taking scope over the anaphor in the fronted predicate. This is because the scope rules may interpret the fronted Deg in the position of its trace, where it, and all the material it contains, is in the scope of the universal. The same point can be illustrated with the examples in (40). In (40a,b), the universal has scope over the trace of the preposed constituent and therefore over the indefinite contained in it. Similarly, the preposed constituents in (40c,d) can be interpreted in the scope of the universals in these examples, namely in the position of t_1, so that a bound variable reading is available. This is in line with (39), because none of these examples requires the universal itself to reconstruct into a position internally to the preposed constituent.

(40) a. [How likely to make some promise]$_1$ do you think [every politician]$_2$ is t_1?
b. [Some child]$_1$ was kissed t_1 by [every politician]$_2$.
c. [How likely to forget his$_2$ promise]$_1$ do you think [every politician]$_2$ is t_1?
d. [To his$_2$ staunchest supporter]$_1$ [every politician]$_2$ extends a helping hand t_1

Williams (1994) discusses a reconstruction anomaly that at first sight seems problematic for the copy-less theory of reconstruction defended here, but that on further reflection corroborates (39), the cornerstone on which it rests.

Example (41a) (Williams's (74)) appears to allow the indefinite *a friend of his* to take scope under *every boy*. This is unexpected under the proposal based on (39), because there is no copy of [*every boy saw t*] in the c-command domain of *a friend of his*, so that it should be impossible for the indefinite to reconstruct in the scope

[4]It remains to be seen whether the command condition on scope, and its well-documented exceptions, will follow from independent constraints on scope representations, along the lines of the c-command condition on syntactic dependencies. Reinhart (1983) relates the c-command requirement on variable binding to principles of compositionality and a processing condition requiring early closure of open expressions (Kimball 1973).

[5]Note that this conclusion holds irrespective of whether the fronted Deg contains a trace of *some young lady*, as that trace will be a full copy of this constituent.

of the universal. By contrast, the present analysis correctly predicts the absence of a wide scope reading for the universal in (41b): there is no copy of [*t bothered a friend of mine*] in the c-command domain of *every article that appeared*, so that scope interaction between the universal and the indefinite is precluded.

(41) a. What every boy saw *t* was a friend of his.
every > a; a > every
b. What *t* bothered a friend of mine is every article that appeared.
*every > a; a > every

Why, then, does (41a) allow reconstruction of *a friend of his*? Williams, following a proposal by Chierchia (1992), proposes that indefinites are ambiguous: while they may function as existentials, they may also be construed as a skolem function. If the trace of *what* in (41a) is given a functional reading, the result is the interpretation in (42).

(42) There is a function that maps every boy to the person he saw and that function is "a friend of his".

This reading is virtually indistinguishable from the one that (39) blocks (namely one in which the indefinite *a friend of his* – interpreted as an existential – takes scope under *every boy*), but is achieved without scope reconstruction. The missing wide scope reading for the universal in (41b) is due to the fact that universals are always quantificational. Hence, the effects of (39) cannot be evaded.[6]

In conclusion, I have argued that Barss's generalization – the observation that traces are opaque for scope reconstruction – is due to the non-existence of trace-internal positions.

5 Further Reconstruction Asymmetries

5.1 Introduction

In the previous section it was shown that syntactic reconstruction and scope reconstruction do not always coincide: the trace of an A'-moved constituent appears transparent for syntactic reconstruction but not for scope reconstruction. Here I want to address the question whether there are other asymmetries between the two types of reconstruction.

[6] The same strategy cannot yield wide scope for the universal in (37), even if the preposed Deg contains a trace of *some young lady*. This is because a quantifier cannot cross a trace that depends on it without causing a WCO violation.

5.2 Asymmetry 2: Obligatoriness

The theory of syntactic reconstruction outlined in section 4.1 predicts that this kind of reconstruction is an obligatory process. This is clearly not a general property of scope reconstruction, witness the existence scope ambiguities.

One manifestation of the obligatoriness of syntactic reconstruction is the co-called Freezing Principle (Wexler & Culicover 1980), the observation that A'-moved elements are islands. Recall that economy considerations determine that no functions can be copied out of the argument of the address-assigning function f_{move}. It should therefore not be possible to extract from a constituent that has undergone A'-movement. This is correct:[7]

(43) a. *Who did you say [(that) [a friend of *t*] John saw *t*].
b. *Young children John said that [[to *t*] you should never give matches *t*].
c. *Who$_1$ did you wonder [[how many brothers of t_1] Bill invited t_2]?

In the same vein, focus scrambling a depictive secondary predicate cannot give rise to new predication relations:

(44) John$_1$ thought that DRUNK$_{*1/2}$ nobody$_2$ had gone home t_{drunk}.

Focus scrambling can also be used to demonstrate the impossibility of binding an anaphor in the antecedent of an A'-trace.[8] In the Dutch examples in (45), scrambling the anaphor *zichzelf* across *alleen Marie* neither creates nor destroys binding possibilities.

(45) a. dat Kim$_1$ alleen Marie$_2$ toestaat om zichzelf$_{*1/2}$te fotograferen
that Kim only Mary allows comp herself to photograph
b. dat Kim$_1$ zichzelf$_{*1/2}$ alleen Marie$_2$ toestaat om *t* te fotograferen
that Kim herself only Marie allows comp to photograph

---

[7]Starke (2001) argues, on the basis of examples like (i), that such extractions are at worst marginal:

(i) ?Who$_2$ is it unclear [how many picture of t_2]$_1$ he wants to shoot t_1?

My informants uniformly reject this example, while accepting the variant in (ii), probably because this example allows a parse in which *of whom* originates in the matrix clause.

(ii) Of whom$_2$ is it unclear <t_2> [how many pictures <*t_2>]$_1$ he wants to shoot t_1?

[8]See Neeleman 1994 for extensive motivation that this type of scrambling is A'-movement.

5.3 Asymmetry 3: Reconstruction to intermediate positions

Obligatoriness also has the effect that syntactic reconstruction is always to the foot of an A'-chain and never to an intermediate trace. Scope reconstruction, by contrast, can target any chain-internal position.

Consider syntactic reconstruction first. The supposed ability of this type of reconstruction to target intermediate A'-positions is almost always demonstrated with binding (see Fox and Nissenbaum 2002 for recent discussion), and more in particular with English *himself* and *each other*. However, when we restrict attention to anaphors that do not allow a logophoric interpretation, such as Dutch z*ichzelf*, the relevant reading is unavailable:

(46) Zichzelf$_{*1/2}$ dacht Jan$_1$ [*t* dat [Frank$_2$ *t* zou kiezen]].
Himself thought John that Frank would choose
'Himself, John thought that Frank would choose.'

Furthermore, even the English data are more subtle than is sometimes acknowledged. Example (47a) shows that the anaphor *himself* must be locally bound. In (47b), in which the same anaphor occurs in a picture DP, this requirement appears to have been suspended: *himself* can be construed with the matrix subject (see Hudson 1990, and Pollard and Sag 1994 for related discussion). This strongly suggests that the anaphor is licensed internally to the picture DP. (For reasons I do not understand, the construal with *John* is facilitated by focusing *these*.)

(47) a. John$_1$ thought that Bill$_2$ would choose himself$_{??1/2}$.
b. John$_1$ thought that Bill$_2$ would choose these pictures of himself$_{1/2}$.

As expected, this contrast is preserved under A'-movement:

(48) a. Himself$_{??1/2}$, John$_1$ thought [*t'* that Bill$_2$ would choose *t*].
b. These pictures of himself$_{1/2}$, John$_1$ thought [*t'* that Bill$_2$ would choose *t*].

Thus, while (48b) gives the impression of syntactic reconstruction (for binding) to *t'*, the contrast with (48a) shows that this is the wrong conclusion. (48a,b) simply mirror the acceptability of their sources in (47).

In contrast to syntactic reconstruction, reconstruction for scope may freely target an intermediate trace. To prepare the ground, we first establish that the contracted

negative element in (49) blocks a pair-list reading. This shows that reconstruction cannot place *which car* in the scope of *every girl* in this example.

(49) *Scenario: John has given every girl a toy car of a different colour. These are now lying in a heap on the floor. The girls are asked to choose one car each.*
Which car did John expect that every girl wouldn't choose?
(i) The red one.
(ii) *John expected that Susan wouldn't choose the red one and that Jessica wouldn't choose the green one.

Now consider the examples in (50). We know from (49) that reconstruction cannot target a position c-commanded by *the girl*. Therefore, the availability of the pair-list reading in (50a) must be due to reconstruction to a position above this constituent but below *every teacher*. This intermediate position is no longer available for scope reconstruction in (50b), because of the intervention effect created by matrix negation.

(50) *Scenario: A group of male teachers have each given a specific girl a toy car.*
a. Which car did every teacher expect that the girl wouldn't choose?
(i) The red one.
(ii) Mr. Johnson expected that she wouldn't choose the red one and Mr. Spinck that she wouldn't choose the green one.
b. Which car didn't every teacher expect that the girl would choose?
(i) The red one.
(ii) *Mr. Johnson didn't expect that she would choose the red one and Mr. Spinck didn't expect that she would choose the green one.

I conclude that syntactic reconstruction is restricted to the root of an A'-dependency, while reconstruction for scope may target intermediate positions.

5.4 Asymmetry 4: Weak island sensitivity

As just demonstrated, scope reconstruction is blocked by negation. However, this element leaves syntactic reconstruction totally unaffected:

(51) HimSELF_1, John doesn't like t_1.

Cresti (1995) discusses examples that exhibit a similar reconstruction asymmetry:

(52) [What image of himself_1] do you wonder whether John_1 has.

Here the WH-prase should not be able to reconstruct to a position c-commanded by *John*, yet the anaphor can be licensed (see Lechner 1998 for related discussion). While *himself* could be a logophor in (52) (see the discussion in section5.3 above), the same patterns is found with examples containing an unembedded contrastively focused anaphor:

(53) HimSELF_1, I wonder whether John_1 likes.

We can use this observation to drive home the contrasting behaviour of scope reconstruction and reconstruction for a syntactic relation, such as binding or predication.

The question in (54a) allows at least two kinds of reply, one of which is a pair-list answer. The presence of negation in (54b) and of *whether* in (54c) creates a typical weak island effect, blocking the pair-list reading in (ii).

(54) *Scenario: A group of boys are playing together in a room full of toys.*
- a. Which toy do you expect that every child will choose?
  - (i) The red car.
  - (ii) I expect Johnny to choose the red car and Freddie the green elephant.
- b. Which toy do you not expect that every child will choose?
  - (i) The red car.
  - (ii) *I do not expect Johnny to choose the red car or Freddie the green elephant.
- c. Which toy do you wonder whether every child will choose?
  - (i) The red car.
  - (ii) *I wonder whether Johnny will choose the red car and whether Freddie will choose the green elephant.

Now consider the data in (55). The fact that all three examples are grammatical shows that in each case reconstruction for predication is successful. It also shows that in each case the *syntactic* requirements of the anaphor are met. However, the absence of a pair-list reading for (55b,c) suggests that – although the anaphor is *syntactically* licensed in this environment – the unavailability of scope reconstruction renders a bound variable reading impossible. By contrast, the bound variable reading *is* permitted in (55a), the only example free of elements that could

interfere with scope reconstruction of the restrictive part of *how pleased with himself*.[9]

(55) a. [How pleased with himself]$_1$ did you expect every student to be t_1.
(i) Pleased enough for a walk down to the pub.
(ii) I expected John to be pleased enough with himself for a walk down to the pub and I expected Fred to be pleased enough with himself to apply to MIT.

b. [How pleased with himself]$_1$ didn't you expect every student to be t_1.
(i) Pleased enough for a walk down to the pub.
(ii) *I didn't expect John to be pleased enough with himself for a walk down to the pub or Fred to be pleased enough with himself to apply to MIT.

c. [How pleased with himself]$_1$ did you wonder whether every student would be t_1
(i) Pleased enough for a walk down to the pub.
(ii) *I wondered whether John would be pleased enough with himself for a walk down to the pub and whether Fred would be pleased enough with himself to apply to MIT.

---

[9]At first sight, it would seem that the same point can be made with the simpler examples in (i) and (ii):

(i) [Which picture of himself]$_1$ did every student like t_1.
a. The one his girlfriend took.
b. John liked the one Susan took and Fred the one Sally took.

(ii) Which picture of himself]$_1$ didn't every student like t_1.
a. The one his girlfriend took.
b. *John didn't like the one Susan took and Fred the one Sally took.

However, as we saw in section 5.3, there is some reason to believe that licensing of the anaphor in these cases does not require syntactic reconstruction of the anaphor itself. This confound is absent with fronted predicates. An anaphor contained in such a predicate reconstructs obligatorily (see Barss 1986 and Heycock 1995 for further discussion). This may be a corollary of the obligatory reconstruction of predication if the anaphor is in fact licensed internally to the fronted predicate (Williams 1994).

Nevertheless, the data in (i) and (ii) support the argument in the main text, because the dependent reading of the WH-phrase in (i) must be due to some variable in it being bound by the universal. This requires scope reconstruction. Since variable binding is impossible in (ii), we may conclude that negation blocks scope reconstruction in this example.

I conclude that the failure of reconstruction witnessed in (55b-c) is limited to reconstruction for scope. It does not extend to relations such as anaphoric binding and predication, which are syntactic.

5.5 Asymmetry 5: Reconstruction in A-chains

We have seen several examples of scope reconstruction in A-chains. However, there is some reason to believe that syntactic reconstruction in such chains is completely impossible. For example, the anaphor in (56a) cannot reconstruct and be bound by *Bill*, while reconstruction should make the principle B violation in (56a) avoidable, contrary to fact.

(56) a. John$_1$ expected [himself$_{1/*2}$ to seem to Bill$_2$ [t_{himself} to be intelligent]].
b. *John$_1$ believed [him$_1$ to be expected [t_1 to win]]

That A-movement and A'-movement differ with respect to syntactic reconstruction is also shown by the fact that *John* in (56a) can bind *himself* in its derived position. Recall that none of the functions contained in a constituent satisfying the address-assigning function f_{move} can be copied (the Freezing Principle). But since *himself* is bound by *John* and not by *Bill*, it must be the case that the function f_{self} has been copied upwards into the matrix predicate from the head of the A-chain, not from its tail.

Williams (1986, 1994) suggests that an A-trace is a syntactic means of externalizing an internal θ-role. Neeleman and Van de Koot (2002) adopt an analysis of A-traces along these lines: they argue that NP trace is a very simple lexical item, containing a θ-function plus the minimal specification required to function as an argument. One telling piece of evidence for this analysis comes from the observation that it is possible to coordinate predicates with VPs containing the trace of A-movement (see Burton & Grimshaw 1992). Dutch, for instance, allows coordination of an AP predicate and a passive VP:

(57) Jan vertrok [[$_{AP}$ dronken] en [$_{VP}$ door iedereen *t* verraden]]
John left drunk and by everybody betrayed
'John left drunk and betrayed by everybody.'

The proposal also correctly predicts the ungrammaticality of (58), in which t_1 introduces the function f_{move}. If syntactic reconstruction could license a copy of this function on t_2, then this example should be as good as one involving *wh*-movement from a complement. However, if there is no syntactic reconstruction in A-chains, then (58) involves extraction from a subject and is excluded for that reason.

(58) *Who$_1$ was [a picture of t_1]$_2$ taken t_2 by Bill.

An alternative interpretation of the data in (56) is defended by Lebeaux (1998), who adopts a derivational approach in which principles B and C must be satisfied at every stage of the derivation, while principle A only requires satisfaction at LF. On this view, (56a) violates principle C on the reading where *himself* is bound by *Bill*, because *Bill* ends up bound by the anaphor, while (56b) violates principle B.

A strong argument supporting the conclusion that example (56a) – on the reading where *Bill* is the antecedent of *himself* – violates principle C comes from the observation that a comparable example in which the anaphor is embedded in a larger constituent does allow the anaphor to be construed with *Bill*:

(59) Mary expected [[several pictures of himself$_1$] to seem to Bill$_1$ [*t* to have been faked *t*]]

While I agree that the contrast between (59) and (56a) is due to principle C, there are a number of reasons why the claim that (59) demonstrates syntactic reconstruction in an A-chain is less obviously correct.

To begin with, replacing the anaphor in (59) with a pronoun, as in (60), results in a grammatical sentence, suggesting that the anaphor functions as a logophor.

(60) Mary expected [[several pictures of him$_1$] to seem to Bill$_1$ [*t* to have been faked *t*]]

Second, as we saw in section 5.3, very much the same asymmetry between embedded and non-embedded anaphors is manifested by apparent reconstruction to intermediate positions in A'-movement structures (witness the contrast in (48), repeated here). But of course principle C has nothing to say about this.

(48) a. Himself$_{??1/2}$, John$_1$ thought [*t'* that Bill$_2$ would choose *t*].
b. These pictures of himself$_{1/2}$, John$_1$ thought [*t'* that Bill$_2$ would choose *t*].

Note that here, too, the embedded anaphor can successfully be replaced by a pronoun:

(61) These pictures of him$_{1/2}$, John$_1$ thought [*t'* that Bill$_2$ would choose *t*].

Third, in A-chains, a comparable asymmetry between embedded and non-embedded material is found with elements that arguably require only scope reconstruction, such as NPIs. This is illustrated with English and Dutch data below:

(62) a. A doctor with any reputation was unlikely to be available.
b. ??Any doctor with a reputation was unlikely to be available.

(63) a. Een dokter met enige kennis van zaken leek niet
A doctor with any knowledge of matters appeared not
voorhanden.
available
'A doctor with any relevant expertise appeared unavailable.'
b. ??Enige dokter met kennis van zaken leek niet voorhanden
A doctor with knowledge of matters appeared not available
'Any doctor with relevant expertise appeared unavailable.'

As was the case with reconstruction in A'-chains, principle C can shed no light on these facts.

Finally, Lebeaux's proposal that all positions in an A-chain are 'active' for binding principles is confronted with counterexamples such as those in (64), which violate principle C at some stage in the derivation but are nonetheless perfectly grammatical.

(64) a. John$_1$ seems to himself$_1$ [t_1 to like cheese]
b. John$_1$'s mother seems to him$_1$ [t_1 to be wonderful]

These examples have the pre-movement structures in (65a) and (65b), in which *John* is c-commanded by a coindexed anaphor and pronoun, respectively. (Compare the ungrammaticality of the corresponding expletive constructions in (65a') and (65b').)

(65) a. *e seems to himself$_1$ [John$_1$ to like cheese]
a'. *It seems to him$_1$ [that John$_1$ likes cheese]
b. *e seems to him$_1$ [John$_1$'s mother to be wonderful]
b'. *It seems to him$_1$ [that John$_1$'s mother is wonderful]

Similar problems do not arise if the trace of A-movement is, as suggested earlier, a lexical item containing a θ-function plus the minimal specification required to function as an argument. Indeed, the data in (56) combined with those in (64) provide a strong argument for the view advocated here, namely that the contentive element in an A-chain is only present in the head of the chain.

6 Conclusion

I have argued that reconstruction is a non-uniform phenomenon: one kind of reconstruction is the result of how the syntax encodes movement and other dependencies; another kind is the result of how scope principles interpret the LF structures delivered by the syntactic component. These types of reconstruction differ in at least the following ways:

1. The trace of A'-movement appears transparent for syntactic reconstruction, even though traces lack internal structure; the 'internal structure' of traces is opaque for scope reconstruction, because traces lack internal structure (Barss's Generalization).
2. Syntactic reconstruction is obligatory; scope reconstruction is not (at least not when surface scope yields an interpretable structure).
3. Syntactic reconstruction only targets the root of an A'-chain; scope reconstruction may target any position in a chain.
4. Scope reconstruction is sensitive to weak islands; syntactic reconstruction is not.
5. There is no syntactic reconstruction in A-chains; but A-chains do permit scope reconstruction.

References

Aoun, Joseph and Audrey Li (1989). Scope and constituency. *Linguistic Inquiry* 20, 141-172.

Aoun, Joseph and Audrey Li (1993). *Syntax of Scope*. Cambridge: MIT Press.

Barss, Andrew (1986). Chains and anaphoric dependence. Doctoral dissertation. MIT.

Boeckx, Cedric (2001). Scope reconstruction and A-movement. *Natural Language and Linguistic Theory* 19, 503-548.

Bresnan, Joan (1973). Syntax of the comparative clause construction in English. *Linguistic Inquiry* 4, 275-343.

Brody, Michael (1998). Projection and phrase structure. *Linguistic Inquiry* 29: 367-398.

Burton, Strang and Jane Grimshaw (1992). Coordination and VP-internal subjects. *Linguistic Inquiry* 23, 305-313.

Burzio, Luigi (1981). Intransitive verbs and Italian auxiliaries. Doctoral dissertation. MIT.

Burzio, Luigi (1986). *Italian Syntax: A Government-Binding Approach*. Dordrecht: Kluwer.

Chomsky, Noam (1993). A minimalist program for linguistic theory. In *The View from Building 20*, Ken Hale and Samuel J. Keyser (eds.). Cambridge, MA: MIT Press.

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

Chierchia, Gennaro (1992). Functional *wh* and weak crossover. In *The Proceedings of the Tenth West Coast Conference on Formal Linguistics*, 75-90. Stanford: Stanford Linguistics Association.

Cresti, Diana (1995). Extraction and reconstruction. *Natural Language Semantics* 3, 79-122.

Fox, Danny (1999). Reconstruction, binding theory, and the interpretation of chains. *Linguistic Inquiry* 30, 157-196.

Fox, Danny and Jon Nissenbaum (2002). Condition A and scope reconstruction. Ms. MIT & Harvard University.

Halle, Morris and Alec Marantz (1993). Distributed morphology and the pieces of inflection. In *The View from Building 20*, Ken Hale and Samuel J. Keyser (eds.), 111-176. Cambridge, MA: MIT Press.
Heycock, Caroline (1995). Asymmetries in reconstruction. *Linguistic Inquiry* 26, 547-570.
Hornstein, Norbert (1995). *Logical Form: From GB to Minimalism*. Oxford: Blackwell.
Hudson, Richard (1990). *English Word Grammar*. Oxford: Blackwell.
Jackendoff, Ray (1997). *The Architecture of the Language Faculty*. Cambridge, MA: MIT Press.
Kimball, John (1973). Seven principles of surface structure parsing in natural language. *Cognition* 2, 15-47.
Koster, Jan (1987). *Domains and Dynasties*. Dordrecht: Foris.
Lasnik, Howard and Mamuro Saito (1992). *Move α*. Cambridge, MA: MIT Press.
Lasnik, Howard (1999). Chains of arguments. In *Working Minimalism*, Samuel Epstein and Norbert Hornstein (eds.), 189-215. Cambridge: MIT Press.
Lechner, Winfried (1998). Two kinds of reconstruction. *Studia Linguistica* 52, 276-310.
Lebeaux, David (1998). Where does the binding theory apply? Technical Report 98-044, NEC Research Institute, Princeton.
May, Robert (1979). The grammar of quantification. PhD dissertation. MIT.
Neeleman, Ad (1994). *Complex Predicates*. Utrecht: Led.
Neeleman, Ad, and Hans van de Koot (2002). The configurational matrix. *Linguistic Inquiry* 33, 529-574.
Neeleman, Ad, Hans van de Koot and Jenny Doetjes (2004). Degree expressions. *The Linguistic Review* 21, 1-66.
Pollard, Carl and Ivan Sag (1994). *Head-Driven Phrase Structure Grammar*. Stanford: CSLI.
Reinhart, Tanya (1983). *Anaphora and Semantic Interpretation*. London: Croom Helm.
Sapir, Edward (1944). Grading: A study in semantics. *Philosophy of Science* 11, 93-116.
Sauerland, Uli (1999). Scope reconstruction without reconstruction. In *Proceedings of WCCFL* 17, 582-596. Stanford, CA.: CLSI.
Sauerland, Uli and Paul Elbourne (2002). Total reconstruction, PF movement, and derivational order. *Linguistic Inquiry* 33, 283-319.
Starke, Michael (2001). Move dissolves into merge: A theory of locality. Ms. University of Geneva.
Wexler, Ken and Peter Culicover (1980). *Formal Principles of Language Acquisition*. Cambridge, MA: MIT Press.
Williams, Edwin (1986). NP trace in theta theory. *Linguistics and Philosophy* 4: 433-447.
Williams, Edwin (1994). *Thematic Structure in Syntax*. Cambridge, MA.: MIT Press.