Reconstruction, Binding and Scope*

Dominique Sportiche

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1 Introduction

1.1 An Informal Introduction

Condition C of the Binding Theory, or some equivalent formulation prohibits coreference between a non-pronoun (names, descriptions, ..) and a pronoun under certain structural conditions. This prohibition is illustrated in the following paradigm (underlined elements are supposed to corefer or to enter into a binding relationship):

(1) a. John said he was running for office
b. * He said that John was running for office
c. the office that John is running for will make him influential
d. the office that he is running for will make John influential

The pronoun may refer to the person designated by the name *John* in a, c, and d but not in b. This pattern shows that linear order is not at stake, or least not alone. The relevant notion involves c-command, leading to the following informal formulation of Condition C:

Condition C
a pronoun cannot corefer with a non-pronoun that it c-commands.

Only in b is this principle violated under the relevant reading. In this context, the following case is surprising:

(2) a. * Whose examination of John did he fear?
b. * He feared Mary's examination of John.

In a, the pronoun does not c-command the wh-phrase, yet this sentence is deviant. This means that some modification of condition C is needed.
A priori we may think that there are two distinct approaches to explain this deviance: either modify the way Condition C is formulated, or keep it constant and modify how we define the kind of input that is used to evaluate whether it is satisfied or not. This is a subtle distinction. For the distinction to be real we must make sure that the two approaches are not mutually interchangeable. If we build into the formulation of Condition C a rule for evaluating the input that duplicates what we would do if we modify the input to Condition C without changing its formulation, the proposals are identical on these data and will have to be evaluated on something they truly do differently. This does not mean there is no issue but the issue will not be relevant to the data we will look at, nor will it modify the logical structure of what ultimately needs to be said.

The second approach has always looked quite plausible, given that the deviance of the sentence (2a) seems related to the deviance of the sentence (2b): in both the offending description is contained in the direct object of the verb *fear*, and the canonical[1] position of the direct object of *fear* is the postverbal position, a position c-commanded by the pronoun. If the direct object is treated as if it were in this canonical object position, we would have essentially manipulated the input to Condition C without reformulating it. Again, there are many different notations that can be used to construe this idea and justifying which one should be used is a rather complex issue related to the choice of approaches discussed above, and not discussed here.[2]

[1] This notion of canonical is far from trivial, of course. Informally, let us think of it in English as the normal immediately postverbal position of direct objects.
[2] The general issue is that of how movement dependencies should be represented - antecedent trace binding relations, slash notation, feature percolation or other possibilities.

Since sentence a above involves a movement dependency between the clause initial wh-phrase and one argument of the verb, a non controversial claim when properly understood, we will use one current notation for this dependency in terms of traces. Accordingly, it can be represented as a binding relationship between this preposed phrase and the direct object position of this verb:

(3) [Whose examination of John]$_j$ did he fear t_j?

With t_j the trace of the wh-phrase. The pronoun *he* c-commands this trace t_j. If we suppose that this preposed phrase is, for the purpose of Condition C, in its trace position t_j or behaves as if it were in its trace position, the problem this sentence raises is accommodated as it now has a structure similar to that of (2b).

Since the preposed phrase is moved, but behaves as if it had not, i.e. as if it were in the position it moved from, this process is, using the spatial movement metaphor, called **Reconstruction:** the preposed phrase is reconstructed into its trace.

The kind of questions we will ask are such as: When does reconstruction take place? Is it always possible. Is it sometimes obligatory? Is it sometimes impossible? Is it sensitive to the type of movement constructions? For example, we may ask of A-movement constructions whether they exhibit reconstructions effects at all (researchers are historically divided on this question) and if they do, do they in the same way as A-bar constructions.

These however are a small corner of a bigger problem. To provide a broader perspective, we note that the investigation of reconstruction effects is part of increasingly larger questions which are important but will essentially be left

unaddressed here.

We may first ask whether reconstruction effects function the same way in all movement constructions.

Secondly we may ask a set of more general descriptive questions. Reconstruction effects can be viewed as special cases of the more general category of **Connectivity** effects. Connectivity effects are cases in which a phrase seems to behave as if it occupied a position different from its "surface" position, i.e. the position that it seems to be occupying in the spoken string. Such effects are found in a great variety of constructions, in particular constructions involving movement but also in constructions for which movement is not clearly or perhaps not plausibly involved.

As descriptive questions we can ask:

- Under what conditions are connectivity effects found?
- Are connectivity effects and reconstruction effects the same: are connectivity effects always and only found in movement constructions?

Connectivity effects have been extensively investigated and there have been many proposals to achieve a principled understanding of their existence and their properties, with repercussions affecting core aspects of the architecture of syntactic theory. One construction in particular stands out as particularly significant: (specificational) pseudoclefts constructions. They exhibit connectivity effects and it is far from obvious that they involve movement (of the relevant kind). They may instead involve deletion or special interpretative rules. Recent work dealing with these questions include Den Dikken et al (2000), Heycock and Kroch (1999), Schlenker (2003), Sharvit (1999).

Finally, we ought to raise theoretical questions, i.e. questions of explanatory adequacy.

- Why do we find the answers that we do to the descriptive questions?
- How is linguistic theory organized so that connectivity effects, or the relationship between connectivity and reconstruction fall out from the very architecture of the theory?

For example, given the current state of the research, it may well be true that connectivity effects are found only in cases of movement (reconstruction effects) or deletion (under some kind of identity). If such is the case, the existence of connectivity is related to the presence of the "connected" phrases in positions other than where they overtly occur, at the right level of analysis. If it were otherwise, the existence of connectivity would appear more mysterious.
Similarly, differences in reconstruction properties in A and A-bar movement constructions should follow directly from the differences between these movement much the same way different projectiles (in a vacuum) follow different paths only due to some difference in their initial velocity and nothing else.

Finally before proceeding, it is worth noting that the data on reconstruction will mostly come from English, the language for which there is a systematic and deep and wide enough body of technical literature. The data are complex and non uniform across speakers. The root of these dialectal differences is not understood. What will be presented here is what in the author's judgment, the technical literature takes more or less to be the standard dialect. The text will contain scattered, non systematic remarks about such variations (see Kuno, 1997, Safir, 1999 for some discussion).

1.2 A More Systematic Introduction

1.2.1 Relevant Principles

We define **Connectivity** effects as cases in which a phrase superficially in a certain position P behaves as if it were in position Q.[3] In principle, such effects could arise and mostly do arise with respect to any principle appealing to the syntactic position of particular phrases (e.g. what it means to be interpreted as an argument of some predicate, to be inflected for a particular Case or to show a certain kind of agreement morphology).

For the most part, we will focus on Reconstruction or Connectivity effects involving a few interpretive principles of Binding and Scope, that is generalizations about structure sensitive referential dependencies between phrases. The term Reconstruction is customarily reserved for such cases of connectivity.

For each of these interpretive principles, we provide a rough approximation of its formulation below, sufficient to illustrate the problems relating to connectivity.

(4) a. Binding Principles

Condition A: anaphors must have a local antecedent (more or less a c-commanding antecedent in the same clause no further than the first c-commanding subject)
Condition B: pronouns cannot have a local antecedent (more or less a c-commanding antecedent in the same clause)
Condition C: pronouns cannot corefer with non pronouns they

[3] This would include all cases of movement, whether overt or "covert", as well as possibly other cases.

c-command.

b. Scope Principles

Principles of Scope :

i. If X superficially c-commands Y, Y can be interpreted in the scope of X

ii. X and Y can outscope each other only if X and Y are clause mates

Principle of Pronominal Binding - a principle of both Binding and Scope:

a pronoun can behave as a variable bound by X only if it can be interpreted in the scope of X

As we have seen above in the case of Condition C, in order to understand reconstruction effects, and beyond, connectivity effects, we need to concurrently develop first how exactly Condition C should be formulated, and secondly what kind of manipulation (syntactic processes, rules of semantic interpretation etc…) surface syntactic structures have to be subjected to in order to provide the right kind of input for the application of this principle.

The same questions arise for each of the principles above. This makes the potential complexity of the resulting system we will need to postulate increase exponentially. Thus it is conceivable that each properly formulated principle requires a different kind of manipulation of the strings we are studying. On the other hand, it is also conceivable that a unique input in conjunction with principles (not covertly encoding in their formulation any manipulation of the surface syntactic string) is sufficient. This would for example justify a level of Logical Form representations, that is, manipulated

surface structures, which all the principles under consideration would take as input.

Regardless of what the correct answer is, it is clear that it will have a fundamental bearing on the internal organization of syntactic theory and its interface with semantic theory.

We will now adopt a certain vocabulary to talk about syntactic dependencies which is standard in the Principles and Parameters family of theoretical models and encodes various assumptions. It is important to keep in mind that this does not affect the essence of the limited data discussed here but does affect the form in which it is presented.[4] One such assumption is the representation of predicate argument relations as structurally local underlying relations modified by movement dependencies. Another is the representation of movement dependencies as trace binding relations. Finally we talk about movement derivationally, mostly because standard vocabulary – invented with a derivational perspective in mind – sounds more intuitive this way.

1.2.2 Movement and Pied Piping

To talk meaningfully about Connectivity and Reconstruction, we need basic characterizations of Movement and Pied Piping. This is what this section provide.

Natural languages exhibit movement dependencies. The existence of such

[4] At the right level of abstraction (/formalization), it is likely that most of the superficial differences between our description of the data and others induced by the particular notation we use would disappear. Assuming that the empirical generalizations we accept are correct, this is due to the fact that the notations most often simply directly encode them (a comment about the relative theoretical shallowness of the field at the present stage of its development).

dependencies can be simply illustrated by the distributional differences between the DPs *the boy* and *which boy*:

(5) a. Jones met the boy
b. Who met the boy
c. * The boy did Jones meet
(6) a. * Jones met which boy
b. Who met which boy
c. Which boy did Jones meet

We want to say that regardless of the choice of determiner D in [$_{DP}$ D boy], this DP behaves as a direct object of *met* in the sense that whatever kind of semantic object this DP stands for, it is understood as bearing the same semantic relation - call it its thematic property - to the predicate *meet* in all these sentences. The fact that D = *which* induces different distributional properties than D = *the* means that these determiners have different licensing requirements. These licensing requirements - call them quantificational in the present case - sometimes force a wh-D (*which*), but not a definite D (*the*) to appear sentence initially, as in (6c).

A minimal description of these observations could take the following form: A DP- say *which boy* - encodes two set of properties (to simplify say only two, even though it may be two among others): thematic properties and quantificational properties. Its thematic properties require it to be paired to some predicate (here *meet*). Its quantificational properties requires it to be paired with some quantificational position (i.e. to be assigned scope: here the clause initial position). The movement dependency is the dependency between the quantificational position of this DP and the predicate.
As mentioned above, we use a standard notation to express this dependency, assuming as correct the consequences that this choice carries (even though

almost everything discussed here could be recast in some alternative notation). In these terms, the thematic properties of the "object" DP in (6c) are expressed by the direct object position this DP occupies in underlying structure or to put it representationally by the position of its most deeply embedded trace. Its quantificational properties are derived from the position it occupies in overt structure, i.e. by the position in which the DP is "pronounced", namely [spec,CP]. The movement dependency is then a dependency between [spec,CP] and the direct object position. A fuller picture would take into account the fact that DPs need (and in many cases morphologically encode) Case. Current theories postulate that all DPs will also involve movement to a Case position to license their Case property.

In the following example:

(7) Bill wonders [$_{CP}$ e_0 [$_{C'}$ [$_{IP}$ [e_1] will be [$_{VP}$ sold [e_2]]]]
|
[which pictures]

we get three positions (e_0 , e_1 , e_2) where e_0=[spec,CP] is the quantificational position, e_1=[spec,IP] is the nominative position and e_2 is the thematic position of the phrase [which pictures].
In this example, the wh-DPs must participate in a movement dependencies between the thematic position, and the quantificational position. What is remarkable is that the need for this movement is a property of the determiner *which*, not of the noun *pictures*. This is made clear by the example (5) which involves the same noun, a different determiner but no similar movement. The fact that the noun *pictures* is pronounced at the front of the clause, is no doubt because (i) *which* needs to be linked to this clause initial position (ii) *which* and *boy* need to be closely associated. Generalizing on standard use,

let us call this property **Pied Piping**:[5] the NP *boy* has pied piped in the sense that it appears where it does, not by virtue of what it is intrinsically but rather because it must be closely associated with an element, *which*, which has this distributional requirement.

Now suppose that a moved XP (e.g. a DP linked to several positions) contains moved material sensitive to the position in which this DP occurs. for a given property, which one(s) of these positions is this sensitive material evaluated in? Because a given DP is only pronounced once but is associated with several positions (e.g. thematic, Case, quantificational...), the overt position in which it appears is not necessarily the one(s) in which it is evaluated. Answering these questions means answering the descriptive questions we listed about reconstruction.

More generally, suppose we have a phrase P linked by movement to several positions ordered from highest to lowest (e_1,e_2,..,e_n). By convention here (we only consider overt movement for the moment), this phrase is pronounced in position e_1. If this phrase P contains material that appears to behave with respect to some principle (e.g. binding theoretic principles) in a position, say e_{n-1}, lower than that in which it is pronounced, we say that we are observing a **reconstruction effect**. We also say that the material **reconstructs** into e_{n-1}.[6] As mentioned earlier, the term "reconstruction" is customarily reserved for cases in which the principles in question are interpretative principles of Binding and Scope.

[5] Standard use takes this to be a case of feature projection instead taking the string D NP *which boy* to obligatorily be a DP (inheriting the D property), and reserves the term pied piping for cases when such feature projection is optional as in [$_{+wh}$ which boy] and [$_{\textbf{Optionally +wh}}$ with [[$_{+wh}$ which boy] 's brother]].

[6] Note that we use the term reconstruction as meaning "connectivity in case of movement". In particular, we make no assumption here about the mechanism by which these reconstruction effects arise.

It is worth remarking that there is no reason to think that this is a scientifically well founded decision: it may well be that the right approach treats in a uniform way reconstruction effects involving thematic roles (something that actually systematically takes place), morphological properties such as Case or Agreement and every other reconstruction effect. Nevertheless it is reasonable to try to understand how reconstruction for scope and binding works before worrying about whether all reconstruction effects should be treated uniformly. In what follows, I will thus use the term "reconstruction" to mean reconstruction for scope and/or binding.

It is in this context that the questions we listed previously arise immediately:

- How does the reconstruction property arise?
- What properties does it have: Is it always possible. Is it sometimes obligatory? Is it sometimes impossible?
- Do the possibilities of reconstruction depend on the overt distribution of P (i.e. on the position in which P is pronounced?

One question we may ask that we will not investigate in detail here is the following: when a phrase is moved, can we in principle find reconstruction effects with any part of this moved phrase. The answer seems to be mostly yes with perhaps one exception: pied piped material clearly shows reconstruction effects but it is less clear whether and perhaps unlikely that the portion of the moved phrase that induces the movement is allowed to reconstruct. In the wh-movement example above, a negative answer would mean that the wh-determiner itself does not reconstruct. We will not discuss this question here.

We will restrict our discussion throughout to the reconstruction of Pied Piped material in the sense of Pied Piping adopted earlier. It should be noted that it is sometimes hard to tell what is the trigger for movement and what is

pied piped, e.g. in the case of topicalization of DPs and VPs, or in the case of A-movement.

With this proviso, the reconstruction problem nearly is the symmetric of the Pied Piping Problem: The Pied Piping problem is the problem of how much bigger a phrase can move than seems strictly necessary, while the reconstruction problem asks how big a portion of a moved phrase can behave as if it had not moved.

The very existence of reconstruction effects may appear somewhat surprising: why should languages bother to move a phrase to some position, only to interpret a portion of this phrase in a position it has been moved from.

This may be taken as a reason to reject a "literal" reconstruction mechanism process in favor of an alternative account without any "moving back". But this would be an illusion for there seems to be no account available at the moment - and perhaps in principle - which does not construe the relevant reconstructed readings differently from that gotten from a structure in which movement of the reconstructed portions would not have taken place at all. And this is precisely what needs to be explained, regardless of the notations used to do it.

By definition, Pied Piped material is moved for reasons extrinsic to the movement trigger. It is thus not so surprising that this material might behave as if it had not moved. Perhaps what is really surprising is why Pied Piping exists at all, so far as is presently known an unexplained property of language.[7]

[7] One possible reason sometimes given is that it may allow to circumvent grammatical constraints on movement. It is also conceivable that pied piped material may in some respect (e.g. in terms of scope, or in terms of the de re / de dicto distinction for example) receive different interpretations than non pied piped material.

2 Basic Reconstruction effects

We begin by illustrating reconstruction effects with each of the interpretive principles we are focusing on. In each case, the examples will show that a (portion of a) moved phrase behaves from the point of this principle as if it had not moved.

2.1 Pronominal Binding

Consider the following examples (where the underlined quantifier is meant to bind the underlined pronoun):

(8) a. no politician ignores many of his collaborators
b. *Many of his collaborators ignores no politician ?
(n.b. this is a weak crossover effect)

The judgments are preserved under movement:

(9) a. Which of his collaborators does no politician ignore t ?
(intended answer: his main pollster)
b. *Which of his collaborators t ignores no politician ?
(intended answer: his main pollster)

the pronoun *his* can only be bound by the quantifier *no politician* if the trace of the wh-phrase containing it is c-commanded by this quantifier, i.e. if the condition on Pronominal Binding is satisfied if we treat the moved phrase as unmoved.

2.2 Scope

Reconstruction effects for scope can be illustrated in a variety of ways. We illustrate cases of scopal interactions between two DPs, and cases of scopal

interaction between a DP and a predicate.

2.2.1 DP/DP interactions

DP/DP scopal reconstruction can be illustrated by such examples as:

(10) Visit some girl, Bill says every boy did t

Such a sentence may be interpreted with the DP *some girl* in the scope of the DP *every boy*, i.e. as meaning that Bill says that each boy visited a girl different from who the other boys visited. If this were the interpreted form, we would not expect *every boy* to be able to outscope *some girl* since these expressions are not clause mates. This is of course a reading that is available in the unmoved counterpart of this example:

(11) Bill says every boy visited some girl

Examples illustrating the same effect but involving wh-movement are given below. First consider the following pair.

(12) a. You convinced three friends of a friend that every member should coopt Bill
b. You convinced Bill that every member should coopt three friends of a friend

Only in the second example is it possible to understand the phrase *a friend* as being in the scope of *everyone*. In other words, in the second example, Joe should coopt a certain number of friends of a friend of Joe's, Mary should coopt a certain number of friends of a friend of Mary's etc.. This reading is unavailable in the first example.
These judgments are preserved under wh-movement:

(13) a. How many friends of a friend did you convince t that every member should coopt you
b. How many friends of a friend did you convince Bill that every member should coopt t

Only in the second example, in which the trace t of the preposed wh-phrase is a clause mate of the quantifier *everyone*, is it possible to understand the phrase *a friend* as being in the scope of *everyone*. This is consistent with the idea that the pied piped material in the preposed phrase can be interpreted as if it were in a position (it occupies overtly or in a position) it has been moved from.[8]

2.2.2 DP/predicate Interactions

Consider the following examples:

(14) a. How many songs will you compose?
b. How many songs will you perform?

Thinking for illustrative purposes of the meaning of the verb *compose* as *cause to be in existence*, and *perform* as *cause to be performed*, we can paraphrase the first question by a below, and the second question by either b or c below:

[8] Consistent with the idea that only pied piped material reconstructs is the observation that it is difficult to understand the wh-quantifier itself as reconstructed: the number asked does not seem able to vary with the choice of member.

(15) a. For what number x, you will cause there to be x many songs in existence

b. For what number x, you will cause there to be x many songs performed

c. For what number x, there are x many songs you will cause to be performed

= how many songs are there that you will perform

The difference lies in the scope of the existential quantification rendered here by *there are*.. with respect to the expression *will cause*. The reading c is less natural in the case of the first question: we cannot assert the existence of set of objects with certain properties if these objects do not yet exist (presuming that if the songs are not composed yet, they do not exist in the relevant sense). For ease of reference, let us call the reading of the first question, or the first reading of the second question the narrow scope reading or narrow reading (since *there* has narrower scope than *will cause*). We will call the second reading of the second question the wide reading. The crucial ingredient here is this: one cannot plausibly be asserting the existence of songs in the second sentence because the preposed phrase is an argument of a verb of creation, namely *compose*. Thus, these two sentence behave like their unmoved counterpart below and thus illustrate a reconstruction effect:

(16) a. You will compose three songs

b. You will perform three songs?

2.3 Condition C

We have already illustrated condition C effects in the introduction. We repeat these examples here:

(17) a. * Whose examination of John did he fear?

b. * He feared Mary's examination of John.

The second without wh-movement behaves like the first, illustrating a reconstruction effect.

2.4 Condition A

Reconstruction for Condition A of the binding theory can seemingly be illustrated by cases such as the following involving the reciprocal anaphor *each other*. Consider first the following paradigm without wh-movement:

(18) a. * She reminded each other's friends that they saw Bill

b. They reminded each other's friends that she saw Bill

c. She reminded Bill that they saw each other's friends

The following pattern with wh-movement exactly mirrors this paradigm:

(19) a. *Which of each other's friends did she remind **t** that they saw Bill

b. Which of each other's friends did they remind **t** that she saw Bill

c. Which of each other's friends did she remind Bill that they saw **t**

Unless some trace of the moved phrase is c-commanded by a potential antecedent, the sentence is ill formed: these sentences behave from the point of view of anaphor binding as if movement had not taken place.
However the anaphor *each other* is a bound variable and thus falls under the Principle of Pronominal Binding. As a result, we need to proceed differently to illustrate a pure Condition A reconstruction effect.
Either we illustrate a condition A reconstruction effect with an anaphor that is not a bound variable or we check that the locality condition that Condition A imposes on the antecedent anaphor relation must be satisfied under

reconstruction. It turns out not to be straightforward to perform either of these tests in a simple way. It is possible that reflexives qualify as non bound variable anaphors in certain conditions (with non quantificational antecedents) but showing that this is the case is at best complicated and perhaps not really possible. Checking the locality condition may be possible in cases involving intermediate traces (that we will discuss later in section 3.1.2) but also involves complications. We thus leave this open at this point.

2.5 Condition B

Showing that Condition B effects are found under reconstruction also requires some analysis. Here is a relevant paradigm: this is a case in which a pronoun shows disjoint reference effects in its original position and under movement (topicalization), i.e. under reconstruction:

(20) a. *Mary says he saw him
b. He says Mary saw him

(21) a. *Him, Mary says he saw t
b. Him, he says Mary saw t

Of course, we should make sure that the third sentence is not independently excluded. It may be if all traces of A-bar moved DPs (e.g. Topicalized DPs) behave like descriptions with respect to Condition C (wh-traces are R-expressions subject to Condition C): t would have to be disjoint from *he* because of Condition C without reconstruction. The acceptability of the second sentence however suggests that the traces of preposed pronouns are not subject to Condition C. If it were, the object t of *saw* would have to be disjoint from *he* (a condition C effect) as in the previous example. We concluded that the parallelism between the first two and the last sentences does illustrate a reconstruction effect.

2.6 Idioms and Theta roles

It is not customary to include the checking of predicate argument relations in discussion of reconstruction effects, even though predicate argument relations (theta role assignment) are interpretative relations. We have already seen in the case of verbs of creation that it is necessary to include such checking in the description of reconstruction effects.
Once this is done, we can recast trace theory (in part) as encoding that reconstruction for thematic role assignment systematically takes place.
For example, in the following paradigm:

(22) a. You think I like John
b. John, you think I like t

The presence of the trace t encodes the observation that from a thematic point of view, *John* in the second sentence behaves exactly as *John* in the first: this is a reconstruction effect.
Although it is not fundamentally conceptually different from the general case, one special subcase of this is particularly useful, namely the case of (non compositional) idiom chunks:

(23) a. You think Mary took much care of Bill
b. How much care do you think Mary took t of Bill

Unlike what happens with a preposed name or description, a preposed idiom chunk receives no relevant interpretation independently of the rest of the idiom. As a consequence, it must be understood exactly as if it was as reconstructed.

3 Some Basic Generalizations

This section is a short overview of some basic generalizations regarding reconstruction in A-bar movement cases which form the basis of many discussions. They will be discussed in turn.

We have seen that there are reconstruction effects with respect to every principle listed in (4). Recall that a reconstruction effect is an "as if" effect: a moved item I behave as if it were in a different position Q from the position P in which it is "pronounced".

The first generalization is that Q is a position from which I has moved, and no other position: reconstruction in movement cases is into traces, including intermediate traces, and nowhere else.

The second generalization is that there are reconstruction effects in every type of phrasal movement: all varieties of A-bar movement constructions and A-movement constructions (we leave aside non phrasal movement cases).

3.1 Reconstruction: Where to?

3.1.1 No reconstruction into non traces

Naturally, it is not possible to prove that reconstruction is possible only into traces. However, individual examples can be (and have been) provided showing that other options are unavailable. We repeat below a few such examples making the relevant point explicit.

Consider the following contrasts in which the pronoun *he* may or may not corefer with the phrase *the typical male viewer*:

(24) a. [Whose characterization of him does the typical male viewer like t?
b. * [Whose characterization of the typical male viewer does he like t?

We construed this as indicating that the preposed phrase (wh-moved) is reconstructed in the t position. That it is the position of this trace that matters rather than the mere fact that some movement has taken place is demonstrated by the following contrast:

(25) a. Which examiner of a good student you know did you tell **t** that he knew the dean
b.* Which examiner of a good student you know did he tell the dean that you knew **t**
c.* Which examiner of a good student you know did you tell the dean that he knew **t**

it is only when the trace t of the preposed wh-phrase is c-commanded by the pronoun *he* that deviance ensues. Thus, it is the position from which movement originates that is important.

The same conclusion can be reached for other principles.

We can illustrate it in the case of the reciprocal anaphor *each other*. The examples below show that that unless some trace of the moved phrase is c-commanded by a potential antecedent, the sentence is ill formed.

(26) a. *Which of each other's friends did he remind **t** that they saw Bill
b. Which of each other's friends did they remind **t** that he saw Bill
c. Which of each other's friends did he remind her that they saw **t**

This shows again that we are dealing with a reconstruction effect and not the effect of *some* movement having taken place.

Similar examples can be constructed for Pronominal Binding (where the underlined quantifier is meant to bind the underlined pronoun):

(27) a. Which of his collaborators does no politician ignore t ?
(intended answer: his main pollster)

b. *Which of his collaborators t ignores no politician ?
(intended answer: his main pollster)

As illustrated, the pronoun *his* can only be bound by the quantifier *no politician* if the trace of the wh-phrase containing it is c-commanded by this quantifier.
We can also illustrate this with respect to scopal interaction between quantifiers:

(28) a. How many friends of a friend did you convince t that every member should coopt you

b. How many friends of a friend did you convince Bill that every member should coopt t

Only in the second example, in which the trace t of the preposed wh-phrase is a clause mate of the quantifier *everyone*, is it possible to understand the phrase *a friend* as being in the scope of *everyone*. In the second example, Joe should coopt a certain number of friends of a friend of Joe's, Mary should coopt a certain number of friends of a friend of Mary's etc.. This reading is unavailable in the first example. This is consistent with the idea that the pied piped material in the preposed phrase can be interpreted in a position (it occupies overtly or in a position) it has been moved from.

3.1.2 Reconstruction into Intermediate Positions

When a phrase is moved several times, reconstruction appears possible, at least in some cases, in any position the phrase has moved through: reconstruction is possible into any trace.
Let us examine the logic of this situation. Consider the following structure,

in which each element c-commands the next one:

(29) P … A … t1 … B … t2

in which P is a phrase moved from t2 to the c-commanding t1 on to the surface c-commanding position of P. To illustrate the existence of cases in which reconstruction is into t1, we need to look at cases in which the exact reconstructed position of a moved phrase matters. One option is to check Condition A which imposes a locality requirement.[9]
The reconstruction properties of pied piped anaphors is exemplified by the following examples:

(30) a. I wonder which pictures of each other you think they said we liked

b. I wonder which pictures of each other you think [t1 they said [t2 we liked t3]]]

[9] For a variety of reasons (if P reconstructs in t2, it will be in the scope of A and B) it is more difficult to illustrate this property of reconstruction into intermediate traces with other principles. N.B. Understanding the rest of this footnote requires knowledge of material presented later.
One option is the following example:
i. Which picture that John sold to her did you convince every girl t1 that he had stolen t2
This sentence seems good with *her* bound by *every girl* and *John* and *he* coreferential.
Reconstruction of the relative clause *picture that John sold to her* is required to allow pronominal binding of *her* by *every girl*. If reconstruction was in t2, it would create a Condition C effect between *he* and *John*. However, if reconstruction is in t1, no condition C effect is created. Note that the relative clause is an adjunct and can thus be “late inserted" in t1.

The first example is ambiguous as to what the antecedent of the reciprocal anaphor is. Any underlined DP qualifies (contrast this with (19)):

(31) a. I wonder which pictures of the others (of you) each of you thinks they said we liked t
b. I wonder which pictures of the others (of them) you think each of them said we liked t
c. I wonder which pictures of the others (of us) you think they said each of us liked t

This state of affairs finds a ready description given the otherwise well supported assumption that extraction out of a sequences of clauses proceeds by successively fronting the moving phrase to the beginning of each clause containing it until it finds its final landing spot.
As a result, a more complete representation of (30a) is (30b). Optional reconstruction into traces can then put the moved phrase back in any intermediate t position, where it can select an appropriately local antecedent. If reconstruction in t1 or t2 was not available, neither you nor they would qualify as appropriately local antecedents. This is a reconstruction effect in "intermediate" traces.
Note that this paradigm also illustrate a reconstruction effect for Condition A.

3.2 Reconstruction and Movement Types

We now briefly address the question of whether the possibility of reconstruction is sensitive to the type of movement involved. We will show that reconstruction effects seems to be found with all types of movement.

3.2.1 A-bar movement

Reconstruction effects are not limited to direct wh-questions of DPs. We find the same Condition C effect as above in direct or indirect wh-questions or Topicalization of various phrases such as PPs, APs or VPs or other types of A-bar movement of various phrases.
This is illustrated in the following examples:

(32) a. * I wonder [whose pictures of a successful athlete] he reminded Bill that you saw t
b. * It is incredible [how proud of a successful athlete] Mary told him you were t
c. *[Next to a good student's locker], she always puts stickers t
d. *[Train a successful athlete I know] , he says I should t

The following examples exemplify reconstruction effects with the anaphor *each other* in a variety of constructions:

(33) a. I wonder which of each other's comments they/*Sue reported t
b. Which of each other's friends did they/*Bill remember t
c. * It is incredible [how proud of each other] Mary said you were t
d. Next to each other's starting blocks, the athletes /*she put lucky charms t

And the examples below do the same thing for bound pronouns:

(34) a. I wonder whose comments about him no one reported t
b. Happy that he had to lie, no one thinks you are t
c. Against his own country, no true patriot will ever fight t

3.2.2 A-movement

We will now demonstrate that reconstruction effects are also found with A-movement. It should be noted that this is a more controversial conclusion. The reason is that reconstruction seems to fail in a variety of A-movement cases.
Dealing in detail with this controversy is beyond the scope of this article. The preponderance of the evidence clearly supports the existence of reconstruction effects in A-movement constructions. Here, we will limit ourselves to presenting some clear cases of reconstruction effects, noting a couple of cases of reconstruction failures.
The basic problem is raised by the ambiguity of the following sentence:

(35) A Russian seems to have won the race

This sentence can have the following two paraphrases:

(36) a. It seems that there is Russian who won the race
b. There is a Russian who seems to have won the race

In the first one, existential quantification takes place inside the scope of the verb *seem*. In the second, existential quantification outscopes the verb *seem*. One standard account takes the following form:

1. The target sentence involves raising to subject, that is, it is associated with a pair of syntactic representations roughly:

(37) a. seems [a Russian to have won the race]
b. a Russian [seems to have won the race]

These two representations are technically described as respectively the

underlying structure of the target sentence and the surface structure of the target sentence.

2. The relationship between these syntactic structures is movement: the difference between these two structures – the relative position of the constituent *a Russian* – is formalized as a movement rule or movement dependency the effect of which is to express the non redundant portions of these two structures: the constituent [a Russian] is raised from the position "subject of the embedded clause" to the position 'subject of the main clause; everything else remains the same. This movement, called raising to subject, belongs to the subcategory of A-movement.

3. The scopal ambiguity arises from taking either of these representations as input to compute scope relations, the first one giving rise to (36a) or (36b), the second to (36b) only.

4. Since the first interpretation is computed on the basis of the representation of the target sentence which does not surface, it looks like this interpretation is reached by exactly undoing movement: this is a reconstruction effect.

Many authors have argued that there is reconstruction under A-movement in this sense (e.g. Barss, 1986, Lebeaux, 1998, Fox, 2000a, Romero, 1997, or Sportiche, 1996, 1997, 1999). Some authors (e.g. May, 1985) have argued that these readings arise by a different mechanism than exact undoing of the movement (they invoke a mechanism of Q-lowering). These doubts are echoed by Zubizaretta 1982 or Lasnik, 1998 regarding whether there is reconstruction under A-movement. The form of their argumentation is as follows:
If there is reconstruction, we expect it to be fully general. Whenever we have a raising to subject structure, we should expect all interpretations to be

available that are computed on premovement structures. If some of these interpretations are not available, this suggest that reconstruction in is not generally available.

One such case is attributed to Chomsky by Zubizarreta. It is based on the pair:

(38) Everyone is not listening
(39) Everyone seems not to be listening

The first sentence allows a reading in which negation outscopes the universally quantified subject yielding the meaning:

(40) It is not the case that everyone is listening

Assuming reconstruction is available in the second sentence, it should, from the relevant interpretative point of view be treated like:

(41) It seems everyone is not listening

And thus yield the following interpretation which is not an available interpretation:

(42) It seems that it is not the case that everyone is listening

Lasnik argues for a similar conclusion based on the available readings for the following (and other comparable examples):

(43) Every building is 10% likely to collapse

If reconstruction were available in such a case, it should be behave like:

(44) It is 10% likely that every building will collapse

But such a reading seems unavailable. What (43) says is that each building has 10% probability of behaving a certain way. If there are 2 buildings in total, the probability that both collapse is $(10\%)^2$, that is 1%, not 10% as (44) states. In other words, *every* cannot scope under *10% likely*: reconstruction seems impossible.

Although such cases raise serious problems which a theory of reconstruction must address, they do not seem to undermine the availability in principle of reconstruction in A-movement cases.
First, note that the reading (40) of (38) (and many other similar cases) looks like a straightforward case of reconstruction of A-movement from VP-internal subject position:

(45) Everyone is not [t listening] → is not [everyone listening]

Secondly, there are many other cases that Barss, 1986, Lebeaux, 1998, Fox 2000a, Romero 1997 or Sportiche 1996, 1997, 1999 provide suggesting reconstruction does take place.
First, cases involving complex scopal interactions can straightforwardly be computed on the basis of the premovement structures. Consider the following examples:

(46) a. A southerner is predicted to win every senate race
b. It is predicted that for every senate race, a (different) southerner will win it
c. For every senate race, there is a (different) southerner who is

predicted to win it

d. For every senate race, it is predicted that there is a (different) southerner who will win it

Three relevant scope inducing elements are involved: the existential quantifier introduced by the singular indefinite subject *a southerner*, the universal quantifier *every* and the verb *predict*.
A priori this should yield six scopal readings but the three in which *a southerner* outscope *every senate race* are pragmatically odd (since they require the same southerner to win every senate race). The remaining three are listed in (46b, c, d). (46b) clearly is the most accessible and natural reading but is also the most relevant for our present purposes. The readings paraphrased in (46b,c) correspond to readings in which the sentence expresses a summary of individual predictions, one for each senate race. Such readings seem difficult at best, perhaps entirely unavailable for this sentence (although pragmatically quite plausible): the sentence in (46a) most naturally reports a unique global prediction. This means that the only way that *every senate race* can outscope *a southerner* is if both of them are in the scope of the verb *predict*. These two observations indicate that (perhaps the only) one input for scope computation is (47a):

(47) a. is predicted [a southerner to win every senate race]

b. a southerner will win every senate race

As the prominent reading of (47b) shows, within a single clause, *every senate race* can then outscope *a southerner*.

Secondly, reconstruction effects can be illustrated with binding effects.
Let us begin with Condition A.
Consider the following well formed examples:

(48) a. pictures of each other seemed to the boys [t to be fuzzy]

b. pictures of each other struck them as [t rather fuzzy]

c. it seemed to each of the boys [that pictures the other boys were fuzzy]

d. It struck each of them [that pictures of the others were fuzzy]

Sentences in a and b are well formed with the readings indicated in c and d respectively, even though the antecedent *them* of *each other* does not c-command it. Furthermore, the presence of an acceptable (plural) antecedent seems crucial to their acceptability. A similar reading with a discourse antecedent or a singular antecedent is unavailable. Thus, the following are deviant:[10]

(49) a. * pictures of each other seemed (to him) [t to be fuzzy]

b. * pictures of each other struck him as [t rather fuzzy]

The interpretation of these facts is straightforward and indicates that reconstruction for binding is possible. Under reconstruction, sentences (48a) and (48b) and (49a) and (49b) are respectively treated from the point of view of binding as their underlying structures:

(50) a. seemed to the boys [pictures of each other to be fuzzy]

b. struck them as [pictures of each other rather fuzzy]

(51) a. * seemed (to him) [pictures of each other to be fuzzy]

b. * struck him as [pictures of each other rather fuzzy]

[10] We are not considering the reading in which each picture is of the other pictures, which may be available but is irrelevant.

In the first two examples, the anaphors have a local enough c-commanding antecedent, while they do not in the last two. The assumption that the experiencer *them/ the boys* does c-command the subject of the embedded clause can be somewhat controlled by the unacceptability of :

(52) * it seemed to him [that John was sick]

which follows straightforwardly from a Condition C violation if this c-command relation holds. The assumption that the experiencer *them/ the boys* does c-command material in the embedded inifnitive can be controlled by the unacceptability of :

(53) * Mary seemed to him [t to like John]

Reconstruction effects with Pronominal Binding can also be directly illustrated. The well formedness of :

(54) a. Pictures of his child seemed to everyone [t to be good]
b. Such evaluations of his speech struck every child as [t unfair]

shows that A-movement can remove a c-commanding binder for a pronoun without creating a violation of the structural requirement for Pronominal Binding. This suggests that Pronominal binding can be evaluated on the premovement (i.e. reconstructed) structures:

(55) a. seemed to everyone [pictures of his child to be good]
b. struck every child as [such evaluations of his speech unfair]

We can control for this conclusion by first noting that close parallels to (55a) support the relevant interpretation:

(54) it seemed to everyone that pictures of his child were good

Second, we can check that in the absence of a position to reconstruct the raised subject in, the relevant reading is unavailable (due to the Weak Crossover Effect (WCO)):

(56) a. * the new friend of his father painted every child
b. * such teachers of her children call every mother

Similar reconstruction effects can also be illustrated for Condition C (cf. again Fox, 2000a, Romero, 1997 or Sportiche 1996, 1997, 1999). We present one such type of example which will become relevant later.
First note that the following French idioms can be somewhat marginally passivized as indicated:

(57) a. Jean a pris grand soin de Marie
Jean took a lot of care of Marie
b. ?Grand soin de Marie a été pris (par Jean)
*A lot of care of Marie was taken by Jean

(58) a. Dans cette conversation, Jean a pris le parti de Marie trois fois
In this conversation, Jean took Marie's side three times
b. ?Dans cette conversation, le parti de Marie a été pris trois fois (par Jean)
?In this conversation, Marie's side was taken three times by Jean

The idea is to use these idioms to design examples in which movement of an idiom chunk overtly removes a Condition C configuration. Their crucial feature is the passivizable object which can contain a name, and which can

then be raised across a coreferential pronoun. We get the following:

(59)a. ?Grand soin de Marie me semble avoir été pris t
b. ?Grand soin d'elle$_j$ lui$_j$ semble avoir été pris t
c. ?Grand soin de Marie$_j$ lui$_k$ semble avoir été pris t
d.. *Grand soin de Marie$_j$ lui$_j$ semble avoir été pris t
Good care of Mary/her seemed to me/her to have been taken

(60) a. ?le parti de Marie me semble avoir été pris t trois fois
b. ?son$_j$ parti lui$_j$ semble avoir été pris t trois fois
c. ? le parti de Marie$_j$ lui$_k$ semble avoir été pris t trois fois
d.. * le parti de Marie$_j$ lui$_j$ semble avoir été pris t trois fois
Mary's /her side seemed to me/her to have been taken three times

(Passivization followed by) raising of the embedded direct object containing a name across a coindexed pronoun systematically yields the deviant sentences (59d) and (60d) as compared to the benchmark in which either the direct object contain a name but is raised across a non coindexed pronoun as in (59a,b) or (60a,b) or the direct object contains a pronoun as in (59c) and (60c).[11]

We noted earlier in section 2.6 that idiom chunks had to reconstruct for the

[11] An additional control would raise a name or a pronoun across a name Experiencer, but raising across a non pronoun is deviant in French (as in German or Dutch unlike what happens in English):

i. *Ma place semblait à Marie avoir été prise
My seat seemed to Marie to have been taken

This is only marginally improved by "extraposing" the Experiencer:

ii. *?Ma place semblait avoir été prise à Marie
My seat seemed to have been taken to Marie

purpose of idiom interpretation. The effect of idiom reconstruction is to create a configuration violating Condition C. Since the sentences are deviant, they show that Condition C has access to structures reconstructed for the purpose of idiom interpretation.

3.3 Modalities of Reconstruction

Depending on the circumstances, reconstruction seems to operate differently. In this section we briefly describe some observed possibilities before returning to some of them in later sections. First we will illustrate the observation that reconstruction may appear to be obligatory, optional or impossible. Secondly we will briefly consider how much of a moved phrase can reconstruct.

3.3.1 Obligatoriness, Optionality or Impossibility

We will illustrate the following basic observations.
First, in the simple and general case, reconstruction for Condition A is optional, while reconstruction for Condition C is obligatory.
Consider again the cases of Condition C discussed previously. Imagine the context of asking questions about, or commenting to a person comparing and analyzing, various surveys of TV viewers. We find the following:

(61) a. * [Whose characterization of the typical male viewer does he object to t?
b. * The standard characterization of the typical male viewer, he objects to t

It is not sufficient to say reconstruction is available, we must say it is obligatory. If the option of not reconstructing the (pied piped portion of the)

preposed phrase in its trace position was available, there would be a derivation without a condition C violation and the sentences should be acceptable.
It is not the case however that reconstruction of pied piped material is always obligatory. In some cases, it seems to be optional. Observe the following contrast:

(62) a. *[Whose characterization of the typical male viewer does he resent t?
b. [Whose survey describing the typical male viewer does he resent t?

This contrast is typically taken to reflect a complement/adjunct asymmetry (see van Riemsdijk and Williams, 1981, Freidin, 1986, Lebeaux, 1988, 1991, 1998). The offending description in (62a) is part of a pied piped complement of the pied piped head N of the wh-phrase, while it is part of the adjunct (the relative clause) to the pied piped head N of the wh-phrase in (62b).
We return to discussion of these facts in section 4.2.1.

In the case of Condition A, the optionality of reconstruction can easily be illustrated. We have seen that pied piped phrases containing anaphors may reconstruct into any of their traces but they need not reconstruct at all. Thus the sentence (63a) is well formed with the interpretation given in (63b):

(63) a. They wonder which pictures of each other I preferred t
b. Each of them wonders which pictures of the others I preferred

If reconstruction was required, we would expect this sentence to be deviant, since the only possible antecedent *they* for *each other* would be "too far". This expectation is not met.

Secondly sometimes reconstruction is impossible. We have already seen such cases in A-movement constructions. For example, the following sentence lacks a reading in which *10% likely* outscopes *every*:

(64) Every building is 10% likely to collapse

Other, superficially more complex cases of impossible reconstruction are illustrated below:

(65) a. Stand on every roof, a guard will
b. A guard will stand on every roof
c. Every roof will have a different guard on it

(66) a. Likely to win, nobody is
b. Nobody is likely to win
c. it is likely that nobody will win
(= in all likelihood, nobody will win)
d. nobody has the property of being likely to win

In the first set, the first sentence should, under reconstruction of the preposed constituent, allow all the readings allowed by the second sentence, and in particular, the pragmatically most plausible reading paraphrased by the third sentence. Such a reading seems unavailable, perhaps suggesting that reconstruction of the preposed constituent is not possible.

In the second set, the first sentence should, under reconstruction of the preposed constituent, allow all the readings allowed by the second sentence, and in particular, the reading paraphrased by the third sentence. Such a reading also seems unavailable, Only the reading paraphrased by the fourth sentence is available. This again may suggest that reconstruction of the

preposed constituent is not possible.
We will not discuss any of these extremely interesting cases any further here. Sportiche 2003 extensively discusses cases of the first sort in (64). Barss, 1986, Sauerland (1999), and Sauerland and Elbourne (2002) discuss the last two set of cases.

3.3.2 Partial Reconstruction vs. Radical Reconstruction

As we mentioned earlier in section 1.2.2, typically, reconstruction only affects pied piped material. Whether or not this description is factually accurate depends on a fine analysis of movement triggers and targets. Superficially however, it seems false.
First consider a wh-question we already discussed in 2.2.1 (see also fn7).

(67) a. How many friends of a friend did you convince Bill that every member should coopt t

There does not seem to be a reading in which the wh-operator *how many* reconstructs. Such a question would ask for each member, the number of friends of a friend (of his) that you convinced Bill that this member should coopt. The unavailability of such a reading is plausible given that wh-operators seem to be propositional operators which in English[12] scope over the clause in front of which they are preposed. Thus it is quite plausible to assume that they cannot reconstruct.[13] Such examples may thus involve partial reconstruction.

[12] The restriction "in English" is meant to exclude from discussion cases of partial wh-movement (which may also satisfy this description) and cases of scrambling of wh-phrases.

[13] There exist interesting apparent counterexamples such as (i) where do you think every kid will hide (with the reading: every kid will hide in a different place, for each kid, where do you think it is).

There are cases for which it is harder to tell. For example in cases of "Topicalization" such as

(68) a book, it is obvious everyone will buy

the whole of the preposed element can be under the scope of *every*, suggesting total or so-called "radical" reconstruction. But we cannot really decide without knowing exactly what the movement trigger and targets are. In particular, when a constituent is topicalized, there are informational properties added to the sentence (being a topic or a focus etc..). What would it mean for these properties to be reconstructed, and are they?
Finally there are similar cases in A-movement constructions. The reading in which the subject scopes under the raising verb in the first sentence below seems undistinguishable from the interpretation that the second structure – without the movement - would receive:

(69) a. a southerner will win every senate race
b. is predicted [a southerner to win every senate race]

Such cases are also said to involve radical reconstruction. We will not discuss these questions any further here. Some issues regarding A-movement are addressed in Sauerland (1999), Elbourne and Sauerland (2002).

4 Accounts

We now turn to discussions of the accounts that have been given of the reconstruction effects found with each principle, accompanied by some critical remarks. We will provide a discussion of each principle and its associated reconstructed effects in turn. In the next section, we will look at how all the various conclusions reached for each individual principle can be

reconciled in a coherent whole.

We begin by outlining the essential ingredients of the theoretical constructions elaborated in the Principles and Parameters framework to account for the facts above following more or less their historical development. Again, very little that will be discussed depends on the particular notation that we use; most of what we say could readily be translated in other notations. However, we need to be rather specific about this notation to do justice to some of the proposals that have been put forth within this framework.

We assume then:

i. A level of Surface syntactic structures (surface trees or, in minimalist terms, input to spellout). These structures are derived from underlying syntactic structures by means of movement.

ii. A level of Underlying structures (underlying trees). These structures are defined as representing predicate argument relations as local syntactic relations.

iii. Movement maps underlying trees onto surface trees (spell out trees) by successive application. Movement dependencies are represented as trace binding relations in surface syntactic structures.

iv. A surface structure tree can be manipulated by processes yielding its Logical Form (abbreviated LF), which is the interface with non grammatical systems of interpretation.

Note that conceptually, in such models, Logical Form representations which may (or may not) differ from underlying or surface representations, have their raison d'être in providing a transparent input for semantic interpretation. In effect, Logical Forms "are" exhaustive representations of the structure sensitive aspects of sentence meanings. Note also that there is a priori no assumption that LFs are different from Underlying structures or

surface (spelled out) structures.

4.1 Condition A

We begin with a discussion of reconstruction effects with respect to Condition A. Recall what we have established so far:

- There are reconstruction effects with respect to Condition A
- Reconstruction for Condition A can be into any trace position of the moved phrase
- Reconstruction is optional.

How do we account for these properties.

4.1.1 Anywhere Principle

All accounts essentially have the same structure: they simply allow a moved phrase containing an anaphor to be evaluated in any position that it is linked by movement: its original position, any intermediate landing position. In the literature, several alternative proposals are put forth to derive this result:

P1. Literal reconstruction:
Condition A applies at the output of a manipulated surface structure in which pied piped material is literally in a position in which condition A can be satisfied. Under such a proposal, the following sentence in (70a) would be first manipulated to yield the Logical Form (70b). Condition A is applied to this Logical Form, yielding the interpretation in (70c) or ultimately (70d):

(70) a. I wonder which pictures of <u>each other</u> <u>they</u> remained fond of t
b. I wonder which <u>they</u> remained fond of pictures of <u>each other</u>
c. I wonder for which x, <u>they</u> remained fond of x, pictures of <u>each other</u> (x)
c. I wonder for which x, each of them remained fond of x,

pictures of the others_(x)

P2. Modification of Condition A (Barss, 1986, 1988)
The binding domain of an anaphor for condition A is by definition computed from any position that the anaphor has occupied in the course of a derivation. Thus, in (70a), the local domain of the anaphor can be computed either from the position that *which pictures of each other* occupies at surface structure or from t.

P3. Condition A as an anywhere principle (Belletti and Rizzi, 1988)
Condition A can be satisfied in the course of a derivation. As long as an anaphor satisfies Condition A at any point in the course of derivation, Condition A is satisfied. Thus, (70a) is well formed because Condition A is satisfied before wh-movement takes place.

P2 is stated in derivational terms while P3 is stated in representational terms (it can be seen as applying to a single level of representation). For our purposes, they are equivalent. The question then is whether we can distinguish P1 from P2/P3?

Consider first reciprocals. Recall that a reciprocal is a bound variable. As a result, it seems clear that given the shared conceptualization of Logical Form (abbreviated LF), only P1 is acceptable for reciprocals. Indeed, since a reciprocal is a bound variable, to be interpreted as such, it must in the scope of, that is be c-commanded by, its antecedent at LF (recall this is how LF is defined). This means literal reconstruction is required anyway for the LF of (70a). The other alternatives seem to become redundant.

It should be noted that current theoretical developments considerably narrows the difference between these two (or three) approaches. Indeed,

under some recent models (minimalist cyclic models), Logical Form representations are constructed and interpreted cyclically from the "bottom up". As a result, Condition A could reasonably be held to have to be checked at the end of each cycle, rather than only once at the end of the last cycle, giving the appearance of P2 or P3 under the guise of P1.

Turning now to reflexives, it is clear that this reasoning does not necessarily apply to them. Unlike reciprocals, a reflexive does not have to be analyzed as a bound variable. It can be thought of as a pronoun coreferential with (i.e. picking out the same referent as) its antecedent whose selection obeys c-command and locality constraints.
In other words, scope and the determination of an acceptable antecedent are perhaps divorced in the case of reflexives and may thus provide a way to distinguish P1 from P2/P3 as they apply to reflexives. Indeed, if a phrase containing a reflexive is allowed to outscope the c-command position of the antecedent of the reflexive, P1 cannot be right, while P2/P3 may.
We will leave this question open here (but cf. Cresti, 1995, Fox and Nissenbaum, 2002 for some discussion).

4.1.2 Predicate / Argument Asymmetry

The statement that reconstruction for Condition A can be into any trace position of the moved phrase seem contradicted by the existence of the following kind of cases noted in Cinque (1984) or Barss (1986):

(71) a. [These pictures of each other], I think they liked t
b. [Visit each other's parents], I think they will t

(72) a. They think that [these pictures of each other], I like t
b. * They think that [visit each other's parents], I will t

In the first two examples, the preposed phrase may reconstruct allowing *they* to antecede *each other*. The next two examples however diverge: the first one allows *each other* to take *they* as antecedent, indicating that the domain for anaphor binding is the main clause. This is not sufficient however for the second example which is deviant. This suggests that predicate movement (such as VP-preposing) differs from A-bar movement of DPs: predicate movement behaves as if reconstruction is always obligatory even when anaphors are involved: if the preposed predicte must be interpreted in the position t in (72b), its deviance is derived.
This generalization seems corroborated by the behavior of AP preposing:

(73) a. I wonder how fond of each other's parents (Bill thinks) they are t
b. * They wonder how fond of each other's parents (Bill thinks) Sue is t

As the second example illustrates, it is not possible to select *they* as antecedent even though it would be in the local domain of the anaphor if it could compute its binding domain from the moved position. Furthermore, when there are intermediate traces, reconstruction must be "all the way down":

(74) a. * I wonder how fond of each other's parents they think [t Bill is t]
b. * Visit each other's parents, you think [t they said [t Mary and Bill did t]]

Reconstruction into intermediate trace positions would wrongly allow *they* to be antecedent in (74a) and *you* or *they* in (74b).
Descriptively, the computation of the binding domain for Condition A of an anaphor pied piped under predicate movement must take place from the lowest possible reconstructed position. Of course, a theory of reconstruction

should be able to derive why predicate movement behaves differently from other types of movement. We postpone this discussion till section 5.3, until after we have discussed reconstruction effects for Condition C.

4.2 Condition C

We now turn to a more detailed discussion of reconstruction effects with respect to Condition C. Summarizing the descriptive generalizations we have from section 3.3.1, we get:

- Reconstruction for Condition C is obligatory
- Reconstruction for Adjuncts is optional

We will begin by examining how the second generalization should be derived. Next we will survey some proposals regarding the first generalization and proceed to discuss cases in which it appear violated. We will then return to predicate / argument asymmetries discussed in the previous section and survey how these asymmetries should be handled.

4.2.1 Argument / Adjunct Distinction

Recall what the argument/adjunct asymmetry is. It is based on the following kind of contrast:

(75) a. *[Whose characterization of the typical male viewer does he resent t?
b. [Whose survey describing the typical male viewer does he resent t?

As was said earlier, this contrast is typically taken to reflect a complement/adjunct asymmetry (see van Riemsdijk and Williams, 1981, Freidin, 1986, Lebeaux, 1988, 1991, 1998). The offending description in (75a) is part of a pied piped complement of the pied piped head N of the wh-phrase, while it is part of the adjunct (the relative clause) to the pied

piped head N of the wh-phrase in (75b).
The following pair initially suggests that what is stake in this difference is not only the degree of embedding of the offending descriptions within the preposed phrase since they are more or less equally embedded:

(76) a. Which pictures that you had given to an actor you know did he say you wanted back t?
b. *How happy that you had met an actor you knew did he say you were t ?

In both cases, the offending description is embedded inside a pied piped clause. When this pied piped clause is a complement of the Adjective head of the wh-phrase, deviance results. This seems to strengthen the conclusion that we are dealing with a complement/adjunct asymmetry.
We should note however that this assumption is controversial (see for example Safir,1999, Kuno, 1997, Lasnik 1998) and there seems to be some poorly understood speaker variation. In what follows, we will suppose that the relevant difference is indeed a complement/adjunct asymmetry and we will formulate the relevant generalizations in these terms.
At this point, the most mainstream idea concerning how to treat this asymmetry is the one put forth by Lebeaux (1988, 1991).
To resolve this apparent paradox caused by the difference between (75a) and (75b), Lebeaux suggests that unlike a complement to a phrase, an adjunct to a phrase - here the relative clause adjunct to the NP *survey*- can be inserted in a derivation after this phrase has moved (can be inserted acyclically).[14] Accordingly, the derivation of (75b) would have the following stages:

[14] Chomsky (1995) has argued that to make sense of Lebeaux's proposal, we need to abandon the idea of a level of underlying structure in favor of the minimalist cyclic MERGE approach.

(77) a. Underlying Structure: He resents whose survey
b. Wh-movement: Whose survey does he resent t?
c. Adjunct Insertion: Whose survey [describing the typical male viewer] does he resent t?

Since reconstruction is, descriptively, a matter of accessing a premovement structure to evaluate interpretation, no Condition C can arise in such cases if such a derivation is possible. Hence the complement/adjunct asymmetry that we have been assuming holds in these reconstruction cases.

Granting the correctness of the putative adjunct/argument asymmetry and the Lebeaux's basic idea, several questions arise which we address in turn.
Why can adjuncts be inserted in this fashion while complements cannot.
One idea is that relations of predicate saturation and modification must be syntactically local. A predicate need its complement locally to be properly saturated. This means that at Logical Form, a predicate must have its complement locally. If reconstruction is nothing but access to pre-movement structures, complements must be inserted in underlying structures. A phrase also needs his modifier locally somewhere, but this locally can be satisfied anywhere, e.g. after this phrase has moved. Such an idea makes sense especially for representations that are interpreted, that is Logical Forms.
Consider now the following well formed example in a:

(78) a. Which [[pictures of each other] [which John likes]] does he think they like t
b. Which [[pictures of each other] [which John likes]] does he think they like [[pictures of each other]

The head of the relative clause must reconstruct to allow *each other* to be

properly and locally bound by *they* but the relative must have been inserted late in order to avoid a Condition C violation between *John* and *he*. This means the interpreted form must be like in b, that is the head of the relative clause must be present twice: once in the low position because complements must reconstruct and because *each other* needs to be properly bound, and once high so that the relative clause can modify it locally.
This is natural in the context of Chomsky's 1995 proposal that traces are copies (to which we return in section 5.2.1): the second form is simply the Logical Form representation of the first.

(79) a. Which [[pictures of each other] [which John likes]] does he think they like t
b. Which [[pictures of each other] [which John likes]] does he think they like [[pictures of each other]

This means that we could just as well state Lebeaux's idea representationally by stating that the only requirement be that Logical Forms satisfy the locality requirement necessary to interpret Predicate/complement (more generally predicate/argument) and modifier/modifiee relations.
In such a case, the derivation of these sentences (if there is one) would be:[15]

(80) a. Which [[pictures of each other] [which John likes]] does he think they like [[pictures of each other] [which John likes]]
b. Which [[pictures of each other] [which John likes]]does he think they like [[pictures of each other] [~~which John likes~~]]

with selective Logical Form erasure of what need not be interpreted (here the lowest copy of the adjunct).
As a last remark on this topic, it should be noted that relative clauses raise

[15] Throughout, we ignore the lower copy of the wh-element itself.

particular problems. First it is not entirely clear that relative clauses should be treated as adjuncts. Kayne (1994) for example argues that they should be treated as complements of Determiners. Secondly, there are cases which have been argued to involve raising of the head of the relative clause from inside the relative clause (cf. Vergnaud, 1974, Kayne, 1994). According to such proposals, the head of the relative must originate inside the relative clause. Consequently, the relative clause cannot be inserted as an instance of late adjunct insertion, which makes this derivational approach problematic. The representational equivalent does not face such a problem however as selective reconstruction (or partial copy erasure) is still viable.
A relevant case would be the well formed following sentence:

(81) Which [[pictures of each other$_j$] [which Jane showed the boys$_j$]] does she think you like

Since the reciprocal each other, as part of the head of the relative clause, is bound by the object inside the relative clause, this should be a case of a head having raised from inside the relative clause. Under a derivational approach a la Lebeaux/Chomsky, the lower copy should at least contian the head of the relative clause, hence the relative clause itself (since this head is only introduced inside the relative clause), incorrectly triggering a principle C violation as (82a) below. Under a representional approach, no such problem arises: portion of traces can be selectively interpreted if it doable as in (82b):

(82) a. Which [[pictures of each other$_j$] [which Jane showed the boys$_j$]] does **she** think you like [[pictures of each other$_j$] [which **Jane** showed the boys$_j$]]
b. Which [[pictures of each other$_j$] [which Jane showed the boys$_j$]] does **she** think you like [pictures of each other$_j$]

We leave these questions open and refer to Sportiche (2000) for further discussion.

4.2.2 Anywhere Principle

Ignoring the adjunct/argument asymmetries just discussed, the preliminary observations we have presented suggest that reconstruction is obligatory when it comes to Condition C effects.
We first sharpen this observation by asking what happens when there are several traces. The following examples are illustrative:

(83) a. * [Whose characterization of the typical male viewer does he object to t1?
b. * [Whose characterization of the typical male viewer do you think t2 he object to t1?

The second example is deviant.[16] If obligatory reconstruction could be done in the intermediate trace t2, no condition C effect should arise, leaving this deviance unexplained. We conclude that with respect to Condition C, reconstruction is mandatory in the lowest trace, "all the way down".

How should these observations be handled? There are basically two approaches to this observation:

P4: Condition C is an anywhere principle: it cannot be violated at any stage

[16] Some authors disagree (cf. Huang, 1993) and detect a significant improvement in the second member of each pair as opposed to the first one. If this effect is real, a principle like P4 below in the text cannot be right in general.

of a derivation
P5: Condition C applies at Logical Form and Literal reconstruction is obligatory: the (pied piped portion of the) moved phrase occurs in Logical Form in the position of the most deeply embedded trace.

P4 is put forth by Lebeaux (1988, 1991, 1998), while P5 is proposed by Chomsky (1995) and is defended in Fox (2000a) (but perhaps undermined by the later Fox (2000b) and Fox and Nissenbaum (1999) as we will see below).
Comparing P4 and P5, it is easy to see that P5 is conceptually preferable: why should Condition C, a principle of interpretation, apply anywhere else but at Logical Form? This is one of the reasons Chomsky provides for his view.[17] However, just as we have discussed in connection with Condition A, this argument looses some force in a model in which bits of Logical Form are incrementally and cyclically calculated. P4 could in such a model, be seen as applying at the output of each cycle. P5 could too, so that the differences between them would be much diminished,[18] but it could also apply as originally intended by Chomsky (i.e. as last cyclic in a cyclic model).
Still they would not be identical. Are there grounds to decide whether P4 can be an anywhere Principle as Lebeaux defines it.
Note that P4 is stronger than P5: P5 applies to a subset of cases that P4 applies to. The way to decide then is to find cases falling under P4 but not under P5 and see whether they are deviant or not: P4 predicts a positive answer, P5 a negative one.

[17] This would also be necessary in treatments such as Reinhart's 1983, which crucially appeal to the meaning of the sentence and comparisons between ways of expressing it.
[18] Note that if the authors mentioned in the previous footnote are right, Principle could not even be checked at every cycle.

What we need to find then are sentences in which a premovement structure violates Condition C, but the post movement structure does not. P4 predicts them to be deviant, P5 does not.

One class of cases are discussed by Fiengo and May (1994) and Fox (2000a, 2000b) and involve Antecedent Contained Deletion (ACD). A relevant pair is:

(84) a. * If the pollsters showed him the characterizations of the typical male viewer…
b. If the pollsters showed him the surveys the typical male viewer would want them to ...
c. [the typical male viewer would want them to __]$_j$ the pollsters *showed him* t_j

The first example, a Condition C effect, shows that the pronoun *him* c-commands the second object *the characterizations of the typical male viewer*. Despite this c-command relationship, the second example is fine. The basic reasoning they propose is the following (see the references cited for more detail): The antecedent of the missing VP in b is the VP containing the relative clause. Replacing the missing VP with its antecedent would lead to infinite regress (as it still contains the missing VP). To resolve this paradox, movement of the relative to a position outside of the VP must be available as in c, providing a non paradoxical antecedent (in italics) for the missing VP. As a side effect, this movement removes *the typical male viewer* from the c-command domain of the pronoun *him*. The fact that the sentence is fine suggests that Condition C is checked only after this movement has taken place.
However, according to Fox, (2000b) and Fox and Nissenbaum, (1999), the last two sets of examples could be derived without the relative clause being

c-commanded by the pronoun at any level (roughly speaking, the relative clause is merged into the tree as extraposed. Such analyses crucially rely on the fact on the adjunct/argument asymmetry (perhaps analyzed as late adjunct insertion - see below section 4.2.1). Under such analyses, these examples which involve the relative clauses as adjuncts, become irrelevant to the present point. A discussion of this proposal is important to decide the significance of examples such as (84b) and (84b) but this is beyond the scope of this article.[19]
There are cases however which seem more difficult to reconcile with P4. Consider the following examples involving A-movement such as (85a) with (85b) as pre-movement structure:

(85) a. This picture of John seems to him [t to be fuzzy]
b. seems to him [this picture of John to be fuzzy]

Since this sentence is well formed, it suggests that Condition C is not checked before movement, as the pre-movement structure in (85b) would

[19] It is not entirely clear that such an analysis is generally tenable for ACD given the availability of cases such as: *I wanted everyone you did to leave* in which Extraposition seems unavailable for the relative: if *you did* was extraposed, the infinitive would have had to extrapose too but extraposition of infinitivals seems unavailable (viz. * *I wanted you tomorrow to leave*).
Secondly, there may another difficulty found in the following type of acceptable example:
(i) If the journalists always agreed to show him the stories about her that no model would want a known gossiper to see…
These are cases which have been argued to involve raising of the head of the relative clause from inside the relative clause (cf. Vergnaud, 1974, Kayne, 1994): here the head of the relative presumably must originate inside the relative clause (so that it can reconstruct and get *her* bound by *no model*) and thus this construction cannot involve late adjunction of the relative clause in an extraposed position.

otherwise violate Condition C. Lebeaux (1991, 1998), who wants to preserve Condition C as an anywhere Principle, suggests a different theory of underlying structure to get around this problem., namely that in underlying structure, all NPs are empty slots which are allowed to be filled only after A-movement has taken place.
Accordingly the underlying structure for (85a) would be:

(86) seems to <u>him</u> [[$_{DP}$ this [$_{NP}$ e] of [$_{DP}$ D [$_{NP}$ e]] to be fuzzy]

In this structure, it must be assumed that Names such as NPs are NPs (a non trivial assumption) with a silent Determiner noted D here. At this point, this DP would not qualify as a name or an R-expression and thus not fall under Condition C. Insertion of *John* would take place after raising to subject yielding (85a).
There are several problems with such an approach. One problem is that it is unclear exactly what the principles guiding the form of underlying structures are anymore. Another is the fact mentioned earlier and involving idiom chunks (which is actually a fact about scope). Recall that if an idiom chunk is (passivized and) raised, we get condition C effects:

(87) a. ?Grand soin de Marie me semble avoir été pris t
b. ?Grand soin d'elle$_j$ lui$_j$ semble avoir été pris t
c. ?Grand soin de Marie$_j$ lui$_k$ semble avoir été pris t
d.. *Grand soin de Marie$_j$ lui$_j$ semble avoir été pris t
Good care of Mary/her seemed to me/her to have been taken

(88) a. ?le parti de Marie me semble avoir été pris t trois fois
b. ?son$_j$ parti lui$_j$ semble avoir été pris t trois fois
c. ? le parti de Marie$_j$ lui$_k$ semble avoir été pris t trois fois
d.. * le parti de Marie$_j$ lui$_j$ semble avoir été pris t trois fois

Mary's /her side seemed to me/her to have been taken three times

To get a condition C effect, the name must be c-commanded by the pronoun either in underlying structure, or at Logical Form. If the former, a reason must be found as to why an NP object of an idiom chunk must be inserted in underlying structure. If the latter, we must suppose that we reconstruct into the trace position material that was never there in the first place (what then is the reconstruction process?).
Similar conclusions can be reached by looking at cases (cf. Fox, 2000a, Romero, 1997, Sportiche, 1996, 1997, 1999) in which a raised subject containing a name is understood as under the scope of the raising verb. Fox (2000a), provides the following example, again going in the same direction.

(89) * For these issues to be clarified, many more new papers about Quine$_j$'s philosophy seem to him$_j$ [t to be needed]

Fox's reported judgment is as indicated. This sentence is constructed so as to strongly favor a reading in which the existence of these new papers is not asserted. In other words, it strongly favors a reading in which the subject is interpreted as reconstructed in the scope of the verb *seem*, i.e. as corresponding to the underlying representation:

(90) seem to him$_j$ [to be needed many more new papers about Quine$_j$'s philosophy]

Its status ensues from the condition C violation that is incurred.
As control, note that coreference per se is not problematic. The following sentence with the pronoun and the name swapped is fine:

(91) many more new papers about his philosophy seem to Quine$_j$ [t to be needed]

All these cases are cases in which movement removes an offending configuration for Condition C and thus argue against the idea that Condition C is an anywhere Principle.

We conclude Condition C applies at Logical Form and does not apply to Underlying Structures.[20] This is not compatible with P4 but it is with P5 and thus favors P5 (under either construal: cyclic or last cyclic). It is less clear at this point whether P5 is correct in stating that Condition C only apply at Logical Form rather than say to surface representations as well (if they are different).
In a minimalist model such as Chomsky's 1995, given the results above, Logical Form would indeed be the only option.

Assuming the correctness of P5 raises further problems. If the mapping from (what roughly corresponds to) surface representations to Logical Form is not trivial, it remains to explain why in general, such mapping operations (wh-in-situ interpretation, Quantifier Raising apart perhaps from the ACD cases discussed earlier) never bleed Condition C.
For example, in:

(92) a. A different person compared her to every picture of Jane
b. who told him about which picture of Bill

In the first sentence, *Every picture of Jane* can outscope *a different person*

[20] Note that if Logical Form is constructed and interpreted cyclically, the span of A-movement cannot be larger that one cycle (otherwise the Condition C problems with A-movement reappear).

but this interpretative operation (quantifier raising to a position higher than the subject) cannot remove the condition C violation incurred if *her* and *Jane* are coreferential. In the second, if wh-movement preposes *which picture of Bill* to [spec,CP], there will not be a condition C violation at Logical Form.

One option is to assume that there are no "covert" operations (cf. Brody, 1995, Williams, 1986); another is to assume that Condition C applies to "surfacy" structures. In Chomsky's 1995 minimalist framework, the second option is unavailable and the first is not considered. This is why, talking about wh-in situ interpretation, Chomsky suggests that such mapping operations only move the quantifier and not the whole DP (just the D without the NP) yielding the following form which still violates Condition C:

(93) which [who told him about t picture of Bill]

Chomsky's copy theory of traces could be construed differently to handle this general observation. Adopting for expository purposes Fox's construal of such copies as definite descriptions and assuming phrasal covert movement, the Logical Form of (92a) would roughly be:

(94) for every picture of Jane [a different person compared her to this picture of Jane]

New problems of course now arise: if traces are copies, or if movement is limited to Ds, what happens in the cases of ACD discussed above? We refer to Fox (2000a, 200b) and Fox and Nissenbaum (1999) for further relevant discussion.

4.2.3 Predicate / Argument Asymmetry

Unlike argument preposing, predicate preposing does not seem to increase the set of possible antecedent for a pied-pied anaphor. This contrast is illustrated below:

(95) a. They think that [these pictures of each other], John likes t
b. * They think that [visit each other's parents], John will t

How should this contrast be handled?
One class of proposals (Williams 1980, Barss 1986, 1988, Huang 1993 and in part Reinhart and Reuland 1993) require (using different devices) that nothing other than the subject of a predicate can bind an anaphor inside this predicate from outside this predicate: either the anaphor is bound internally to the predicate phrase, or it is bound by the subject of this predicate.
Clearly all such proposals will be able to exclude b above, since the only antecedent it would allow for the reciprocal would be *John*.
However, most will be insufficient general to extend to cases not involving anaphors. For example, Barss (1986), or Heycock (1995) note the ill formedness of the following type of example:

(96) a. * [bribe a Nobel Prize winner]$_k$, he did t_k
b. * [bribe a Nobel Prize winner]$_k$, he says you$_j$ did t_k

The relevant factor here is that coreference between *he* and *a Nobel Prize winner* is excluded.
One option to handle these facts would be to adopt Lebeaux's proposal that condition C is an anywhere principle and cannot be violated at any stage of the derivation. However, we have seen that this option is not tenable. Furthermore, it would not generalize to the anaphor cases.

In effect what is needed to handle all of these cases ((95) and (96a,b)) is some reason why reconstruction of preposed predicates to their lowest trace is required. If such is the case, examples (95b) and (96b) would respectively receive the following Logical Forms:

(97) a. * They think that ~~[visit each other's parents],~~ John will [visit each other's parents]
b. * ~~[visit each other's parents],~~ he says you did [bribe a Nobel Prize winner]

in which the stars immediately follows. This is exactly what Barss (1986) proposes. The question is now why it should be true that reconstruction of predicates is required.
There are two proposals in the literature.
The first is an elaboration of Huang (1993) due to Takano (1995) which we will detail below.
The second is due to Heycock (1995) who argues that predicates must always reconstruct for scope reasons.
If we accept that predicates must (at least under normal circumstances) take narrow scope - and Heycock (1995) provides strong supporting evidence for this claim - we derive the reconstruction properties of preposed predicates. We only have an explanation however if we can derive the idea that predicates must have narrow scope. Otherwise, we simply have a sophisticated stipulation of the result that we want with as many stipulated properties (= predicates must have narrow scope) as results (= they must reconstruct). In other words, granting that predicates must always reconstruct for scope reasons, the question is why.
If somehow, the semantic properties of predicates precluded them from being interpreted with wide scope, we would have such an explanation but there does not seem to be reasons why failure to reconstruct a predicate

should lead to semantic ill formedness. Thus a priori there is nothing wrong with an example representation of the meaning of (98a) as (98b) with wide scope of the predicate:

(98) a. John will sleep
b. There is a property P of sleeping, will (P (John)) (assuming verbs range over properties or relations)

Huang 1993's proposal seems to be successfully extendable to all such cases with some explanatory power because it seems independently plausible given general assumptions about phrase structure. Regarding anaphors, Huang suggests the preposing of predicates actually always preposes a constituent containing the subject of this predicate. As a result, the domain within which the anaphor must be bound is no larger than this preposed constituent itself.
The details of this proposal are as follows:
First, the subject of a predicate is always generated internally to the projection of this predicate as specifier of this projection (this is the so-called Predicate Internal Subject Hypothesis justified on independent grounds). In underlying structure, the subject of a verb V (or an adjective A) is always the specifier of the corresponding VP (or AP). If this subject shows up elsewhere, it has been moved. For example, sentence a below has the surface structure indicated in b:

(99) a. John will see Mary
b. John$_j$ will [$_{VP}$ t_j [see Mary]]

The structure of the example involving VP-preposing now looks like:

(100) a. Visit each other's friends , you think they said [Bill and Mary]$_j$ will t_k
b. [t_j visit each other's friends]$_k$, you think they said [Bill and Mary]$_j$ will t_k

The trace t_j closes off the domain within which *each other* can look for an antecedent and thus can be the only antecedent available. Since this trace is the trace of *Bill and Mary*, *Bill and Mary* is the only allowed antecedent.
One appealing aspect of this proposal is that under these assumptions about phrase structure, pied piping of the subject trace follows from the general properties of phrasal movement: the subject trace is within the minimal phrasal constituent containing the predicate and thus must move along with it; the minimal movable projection of a predicate always contains the (trace of the) subject of this predicate.
Of course, this proposal covers (96a) but not (96b) repeated – with traces-below:

(96) a. * [t_j bribe a Nobel Prize winner]$_k$, he$_j$ did t_k
b. * [t_j bribe a Nobel Prize winner]$_k$, he$_m$ says you$_j$ did t_k

As we saw earlier, (96b) would also be straightforwardly handled as a condition C effect if the VP were forced to literally reconstruct: the description *a Nobel Prize winner* would be c-commanded by the coreferential pronoun *he*, thus triggering a Condition C effect.
If we modify Huang's proposal and suppose that literal reconstruction of moved predicates is required we handle all the relevant facts. This is Takano's1995 proposal. The Huang/Takano proposal provides a simple reason why literal reconstruction is required: traces are bound variables and must, at Logical Form, be in the scope of, i.e. be c-commanded by their binders.[21] In particular, if a preposed predicate does not reconstruct, it will

[21] If trace are copies, such copies must be properly construed so that they are

leave the trace of the subject that it contains without c-commanding antecedent. Thus the behavior of fronted predicates is ultimately due to the Predicate Internal Subject Hypothesis (as Huang suggested) but in two different ways: for anaphors because the predicate always has a trace subject, for Condition C because this trace forces reconstruction of the fronted predicate.

Heycock (1995) not only argues that the Huang/Takano proposal is insufficient,[22] but also that it is too strong. We will comment on Heycock's arguments and their inconclusiveness in sections 5.3.2 and 5.3.3.

4.3 Scope

We now turn to a more systematic investigation of the interaction of reconstruction for Binding and reconstruction for Scope. As we will see such considerations play a major role in determining reconstruction possibilities as shown for example in Cresti (1995), Fox (2000a), Heycock

scopally dependent.

[22] Apart from the arguments of the text above, Heycock argues that the following pair undermines Huang's approach:

i. * I would never consider her Sally's worst enemy

ii. * Sally's worst enemy, I would never consider her

According to Heycock, the preposed constituent in ii could not contain the trace of *her* because it is a DP, a *DP only can have one specifier* and Sally occupies this specifier position. This argument seems less strong as it relies on the italicized assumption that basically contradicts the Predicate Internal Subject Hypothesis (*her* is the subject of the predicate *Sally's worst enemy*), and should thus be taken to be incorrect, pending strong evidence to the contrary, evidence lacking at the moment (there is only some evidence that argument DPs can only have one overt specifier, but this hardly bears on the question at hand).

Heycock also points out other arguments that we will review later in section 5.3.3.

(1995), and lead to substantial reformulations of the problem. In this subsection, we discuss scope reconstruction. In the next section we will turn to the interaction of scope and binding reconstruction.

We have already seen all sorts of reconstruction effect for scope e.g. cases of pronominal binding, reciprocal binding and quantifier/predicate. We now focus a bit more on the latter. Recall that in such sentences as the following in which we paraphrase *compose* as *cause to be in existence*, and *perform* as *cause to be performed:*

(101)a. How many songs will you compose?
b. How many songs will you perform?

we can paraphrase the first question by a below, and the second question by either b or c below:

(102)a. For what number x, you will cause there to be x many songs in existence
b. For what number x, you will cause there to be x many songs performed
c. For what number x, there are x many songs you will cause to be performed
= how many songs are there that you will perform

The difference lies in the scope of the existential quantification rendered here by *there are*.. with respect to the expression *will cause*. The reading c is less natural in the case of the first question: we cannot assert the existence of set of objects with certain properties if these objects do yet exist (presuming that if the songs are not composed yet, they do not exist)[23]. We

[23] This is plausible without relevant context. It would be naïve to conclude that the c

have called the reading of the first question, or the first reading of the second question the narrow scope reading or narrow reading (since *there* has narrower scope than *will cause*) and the second reading of the second question the wide scope or wide reading.

As has often be noted (see Dobrovie-Sorin, 1992, Heycock, 1995, for example), we can unambiguously render the narrow readings of these two questions in French respectively as in as in a and b below.[24] The wide reading of the second question is rendered by c, which also allows the

reading is unavailable for the first question in general. Such a question can very well be asked with the c reading in a context in which the songs have a virtual if not actual existence. For example, knowing that 6 different songs must be composed for a movie, one can ask one of the composers: *how many of these songs will you compose* with the c reading. As T. Stowell points out, the same remark applies to examples of the sort: *I am building the house* which seem paradoxical at the object of the verb of creation is definite (and thus referring to some preexisting entity). Even examples similar to Heycock's 1995 below, carefully chosen to eliminate this possibility, can be circumvented in an appropriate context: i. *How many stories about John is she likely to invent* could be uttered felicitously with a wide reading if we interpret this not as an actual present but as a historical present (reviewing Diana's life and knowing all the stories she invented, we can mentally place ourselves at some stage of her life and utter (i) meaning: (of all the stories she will invent in her life) how many of these is she likely to invent at this point).
In what follows, we always assume that we are not in such contexts in the narrow scope examples.

[24] To the author's ear, only the narrow reading remains available even if we modify the sentence to allow for a preestablished set of songs in discourse as in: Combien vas-tu chanter de chansons apprises l'an dernier / *how many will you sing songs learned last year*? the construction *combien …de* differs from the (partitive) construction *combien .. des* (where des= de +les) as in *Combien vas-tu chanter des chansons apprises l'an dernier?* which also allows *combien* split but uses a different (extraposed) intonation and is ambiguous. See also Fox, 2000, fn20 p.153.

narrow reading:

(103)a. Combien vas-tu composer de chansons
'how many will you compose of songs'
b. Combien vas-tu chanter de chansons
'how many will you sing of songs'
c. Combien de chansons vas-tu chanter
'how many songs will you sing'

Call the construction exemplified in the first two sentences *combien*–split. Given that *combien* means "what is the number (or quantity) x such that", it is natural to take the position of *de chansons* to correspond to locus of the existential quantification "there are x many songs". In this way, the surface form of the French narrow reading question seems to be exactly what we need to express its meaning, as (103a) essentially has the form of (102a). By the same token, (103c) has the form of (102c). It is thus plausible to assume that the ambiguity of the English sentence (101c) is represented at Logical Form by varying what reconstructs:

(104)a. Reconstruction: how many will you perform songs
(narrow reading)
b. No reconstruction: how many songs will you perform
(wide reading)

This plausibility argument as to what the Logical Form representations of such sentences are finds support from some French facts noted in De Swart (1998):[25]

[25] Two remarks on these data:
i. The agreement on the past participle in a is indicated as optional. The correct description is more complex: it depends on the reading that is assigned to the

(105)a. Combien de chansons les enfants ont-ils tous chanté(s)
How many of songs the children have-they all sung

b. Combien les enfants ont-ils tous chanté de chansons
How many the children have-they all sung of songs

c. For what number x, the children all caused there to be x many songs performed

d. For what number x, there are x many songs the children all caused to be performed

The sentence in (105b) only has a narrow reading represented by (105c) with the existential quantifier (there) in the scope of the universal quantifier (all) so that the choice of the songs to be performed can vary with each child. Given that floated quantifier always take their surface scope, this reading is predicted by the assumed LF representation for narrow readings. The sentence in (105a) is ambiguous between the narrow and the wide reading. Under the wide reading represented by (105d), the existential quantifier (there) is not in the scope of the universal quantifier (all) so that the choice of the songs cannot vary with each child.
To make this more concrete, imagine an exam situation in which children have to sing six songs. Three of them are the exact same three for all the children (the imposed program), and the three other are freely chosen by each child (the free program). To the question (105a), it is possible to

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question:(impossible with the narrow reading, optional with the wide reading). See Obenauer (1994) for relevant discussion.

ii. De Swart reports the French facts differently: she reports that under the wide reading, the Universal quantifier *tous* can take scope of the wh-word *combien* (so that the number varies with each child). I think such a reading - a pair list reading - is impossible with a floated Q, but would be possible with a non floated Q (i.e. in *combien de chansons tous les enfants ont-ils chanté?*).

truthfully answer “three” or “six”. To the question (105c), only “six” is a truthful answer.

5 Simultaneous Reconstruction Requirements

In this section, we discuss what happens in situations in which the requirements of several binding and/ or scope principles must be simultaneously satisfied. We actually already have encountered such situations, but we now discuss them somewhat more systematically. A coherent overall theory of reconstruction should be able to handle all such cases, certainly a non trivial task and if achieved, a non trivial result.
We begin by discussing interactions between Condition C and Pronominal Binding. Next we turn to quantifier/predicate scope and Condition C. Finally, we examine the case of predicate preposing and its interaction with scope considerations and Condition C.

5.1 Condition C, Condition A and Pronominal Binding

Lebeaux (1991) reports that Condition C effects and the possibilities for pronominal binding correlate. He discusses examples similar to the following (from Fox, 2000a), in which more such examples are discussed):

(106)a.* Which survey that he could show to the typical female viewer would she hope no pollster would publish t

b. Which survey that he could show to her would the typical female viewer hope no pollster would publish t
(desired answer to both: his most embarrassing)

c. * Quel sondage qu'il pourrait montrer à Madame toutlemonde ne laisserait-t-elle aucun journaliste publier t

d. Quel sondage qu'il pourrait lui montrer Madame toutlemonde ne laisserait-t-elle aucun journaliste publier t

In order for the pronoun *he* to be understood as bound by the quantifier *no pollster*, reconstruction of the relative clause must take place. However, if reconstruction takes place, this puts the indirect object of the verb *show* in the c-command domain of the subject of the verb *hope*. If the latter is a pronoun, and the former is a name or a description, we should observe a Condition C effect and we do as in the a sentence. Otherwise we should not as in the b sentence. The deviance of (106a) indicates that Condition C and the condition on pronominal binding cannot be checked on strictly different inputs. If they were, we should be able to satisfy Condition C on some input and the Condition on pronominal Binding on the other at which the condition C configuration is not met. This for example would be the case if Condition C applies at S-structure but not at LF and Pronominal Binding was checked at LF but not at S-structure.[26]
This reinforces the idea that Condition C applies at Logical Form (but says nothing about whether or not in addition, Condition C applies elsewhere, e.g. to surface representations).

The same point can be illustrated with reciprocals which also act as variables bound by their antecedents. This also illustrate an interaction between the locality requirement of Condition A and Condition C. Contrast the following pairs:

[26] Recall that the condition on pronominal binding cannot fail to be checked at the level at which interpretation is actually performed, i.e. Logical Form, by definition, so the only possibility for strictly different inputs for Principle C and Pronominal Binding is if Principle C applies to surface or underlying structures (if they are different from LF structures).

(107)a. * Which stories *about each other's characterizations of the typical male viewer* would he conclude the journalists should publish
b. Which stories *about each other's characterizations of him* would the typical male viewer conclude the journalists should publish

The example (107a) does not seem to allow the reading in (108a), but example (107b) allows the reading in (108b). Some care is needed to evaluate this contrast as we want to make sure that the interpretation under which (107a) and (107b) are judged have the relevant distributive readings that can (roughly) be paraphrased as:[27]

(108)a. Which stories about the others' characterizations of the typical male viewer would he conclude each journalist should publish
b. Which stories about the others' characterizations of him would the typical male viewer conclude each journalist should publish

5.2 Scope and Condition C

The conclusion that the Logical Form of the narrow and wide readings is as in (104), directly bears on the relationship between scope and Binding with respect to Reconstruction as extensively discussed in Heycock (1995).
She reports the following contrasts (the examples are slightly changed) in a and b below which we will discuss in turn. For the first one, imagine that the following context in which no prior virtual existence has been established

[27] In particular parasitic readings should be avoided e.g.:
i. stories about each other's characterizations = each story is about the characterization of the other stories
ii. stories about each other's characterizations = each one's story about the others' characterizations

for such surveys (cf. fn 23): Have the opinions of the typical male viewer been taken into account in designing surveys of his TV viewing habits? Should we send questionnaires out to him to help us formulate the questions? Is it worth it, given the low response rate we get. In the end, when all is counted:

(109)a. * How many surveys about the typical male viewer is he likely to help design t

b. How many surveys about the typical male viewer is he likely to challenge t

c. * How many is he likely to help design surveys about the typical male viewer

d. How many surveys about the typical male viewer is he likely to challenge t

Let us examine these sentences in turn.

5.2.1 The wide scope reading

Let us first consider the meaning of (109b). Here, we can easily imagine a context in which the surveys about the typical male viewer already exist since he is likely to challenge them. This makes the wide reading readily available, which means that the Logical Form (109d) is fine, avoiding a Condition C effect.

(109)b. How many surveys about the typical male viewer is he likely to challenge t

d. How many surveys about the typical male viewer is he likely to challenge t

We are now faced with an apparent contradiction. We had concluded that reconstruction of non adjunct pied piped material is obligatory to guarantee that we observe condition C effects. This means that at least the nominal *surveys* should reconstruct. For scopal reasons however, it looks like we want the same nominal not to reconstruct.
This problem becomes more acute in the following example:

(110) a. * How many pictures of a famous artist you know is he looking for t

b. LF1: How many pictures of a famous artist you know is he looking for

c. LF2: How many is he looking for pictures of a famous artist you know

Clearly the sentence in (110a) can receive a wide reading and thus get the LF representation LF1 in (110b). This predict that under the wide reading there should not be any Condition C effect. But this seems wrong: coreference between the italicized elements is blocked in (110a). To get this result, we would need to postulate instead of LF1 the logical form LF2 given in (110c). But this would wrongly claim that only the narrow reading is available for (110a).

A solution to this problem can be constructed by using Chomsky's theory of movement traces as copies which we have already seen to help resolve other problems.[28] According to Chomsky's proposal, a sentence like (111a) would have (111a) as surface syntactic representation, (111c) as input to phonology (Phonetic Form or PF) and (111c) as manipulated surface structure for the

[28] This idea is already present in various form in earlier literature, e.g. in Burzio (1986). Chomsky however uses and justifies it in ways consistent with our present discussion.

purpose of interpretation (Logical Form or LF):

(111)a. How many books are you looking for
b. Surface Form: How many books are you looking for how many books
c. What PF sees: How many books are you looking for ~~how many books~~
d. What LF sees: How many ~~books~~ are you looking for ~~how many~~ books

Chomsky's copy theory of movement has several positive aspects. It eliminates the need to postulate objects (traces), whose internal structure is not entirely clear (e.g. how do traces obey X-bar theory). Secondly Move is an operation of copying a moving phrase and deleting the original copy. The copy theory turns movement into a simpler operation essentially identical to the elementary structure-building operation (*merge*). It differs from it only in that it takes as input an object that has served as input for an earlier merger - *move* is *merge-the- same- object-again*, that is by appealing to a notion of identity of distinct syntactic objects which seem independently required by cases of ellipsis, as Chomsky (1995) notes.

The "deletion" part is now handled independently as part of PF interpretation or LF interpretation, and there can be mismatches between what is deleted in PF and what is deleted in LF as the paradigm in (111) makes clear.[29]

Turning back to the problem raised by (110a), we can resolve the contradiction by departing from Chomsky's proposal and assume that the

[29] One problem with copy theory is that portions of the resulting interface representations (in Chomsky's 1995 sense) are allowed to be ignored. This raises questions regarding the empirical content of the "bare output" (or "legibility") conditions crucial to Chomsky's 1995 minimal design conjecture.

Logical Form of (110a) is not (110c) but rather a representation in which both the moved copy and the original copy are interpreted at LF.[30] In the case of a narrow reading, reconstruction must be obligatory as we have now seen several times. In the case of the wide reading, it is important that the moved constituent be interpreted with wide scope, but nothing prevents a copy of this constituent to be interpreted in the original trace position as well. This permits a reconciliation of scope considerations with the obligatory character of reconstruction of pied piped complements necessary to explain certain Condition C effects.[31]

The idea that both copies can be interpreted is developed in Fox (2000a) for different reasons (see also Brody, 1995, Rizzi, 2000, Safir, 1999). Fox suggests that the "bottom" trace is interpreted like a definite description. Other possibilities could be contemplated (Safir, 1999, treats it like a pronoun) but from now on, for ease of exposition, we will represent the lower copy as a demonstrative expression referring back to the top copy when there are two (or more) copies. For the sentence in (112a), this would yield the LF representations (112b) for the narrow reading and (112c) for the wide reading. Taking Fox's proposal into account, we will understand the Logical form of (112c) as (112d).

(112)a. the sentence: How many pictures of *a famous artist* is *he* looking for t
b. its narrow reading LF How many is *he* looking for pictures

[30] This proposal takes care of all the problems raised in Heycock (1985, section 6) for the idea that Condition C only applies at LF.

[31] Another option would be to get the wide reading from a representation like: (i) *how many you are looking for pictures*, and let the indefinite *pictures* take wide scope by other mechanisms (e.g. choice function). Space precludes a discussion of this option. Let us remark that it would wrongly predict impossible answers to questions such as *(105)a. Combien de chansons les enfants ont-ils tous chanté(s)*.

		of a famous artist
c.	its wide reading LF:	How many pictures of a famous artist is *he* looking for pictures of a famous artist
d.	paraphrase of the wide reading LF:	How many pictures of a famous artist are such that *he* looking for <u>these</u> pictures of a famous artist

The effect of interpreting both copies in the case of wide readings are clear: in all cases, we see that coreference between *he* and *a famous artist* leads to a condition C violation.

5.2.2 The Narrow Scope reading

Turning now to (109a), its reported deviance might look surprising. Since *about the typical male viewer* is an adjunct, it should be allowed not to reconstruct and thus should not have to feed Condition C. The reason for the deviance, Heycock hypothesizes for similar examples, is that the Logical Form representation of (109a) must be (109c), with reconstruction of the restriction of *how many*. Indeed, the surveys about the typical male viewer not having been designed yet, only the narrow reading of this question is plausible. In the sentence (109b), the wide reading is plausible, thus allowing the logical form (109d), which causes no Condition C violation.

Note that in such circumstances, for this reasoning to go through in the case of the narrow reading, it must not be possible to totally reconstruct the nominal head *surveys* of the preposed constituent without reconstructing the adjunct modifier *about the typical male viewer* as well. This seems reasonable: the adjunct must, by hypothesis be predicated of some modifiee which it must stand in a syntactically local relation to: as a result, it cannot

be left stranded in a high position.

5.3 Predicate Movement, Scope, Condition C and Predicate Internal Subjects

5.3.1 Scope Reconstruction and islands

Recall that we concluded that moved Predicate phrases always reconstruct. This means that predicate movement should never obviate condition C effects, nor should it increase the set of possible antecedents for a pied piped anaphor. These two points are again illustrated below:

(113)a. * [t_j Pleased with <u>an old painter</u>], I think <u>he</u> was t
b. * [t_j Pleased with <u>an old painter</u>], <u>he</u> thinks you were t
c. * [t_j Visit [each other]$_k$'s parents], you think they said [Bill and Mary]$_j$ will t

In the first two cases, obligatory reconstruction will put the preposed constituent back in the position t thus triggering Condition C effects. In the last case, the presence of t_j prevents anything other than *Bill and Mary* to qualify as antecedent for *each other*. Note that the Predicate Internal Subject Hypothesis truly derives the required reconstruction from the independent existence of a condition on pronominal and variable binding.

Heycock (1995) provides support for her observation that predicates are limited to taking narrow scope. This support is based on some extraction facts out of wh-islands. Several authors (e.g. Cinque, 1991, who attributes the observation to G. Longobardi) have noted that an amount question (*how much , how many*) out of wh-islands is only possible if this question receives a wide scope reading in the sense of the text. Thus we find the following facts (e.g. with *how many)*:

(114)a. * How many songs do you wonder whether Sue will compose t
b. ? How many songs do you wonder whether Sue will perform t

In the first amount question (without context), lexical choices strongly favor the narrow reading (the wide reading: how many songs are there such that… is implausible given that the songs are not yet composed). In the second sentence, the wide reading is plausible and the sentence is better (with the reading how many songs are there such that….).[32]
Degree questions (e.g. with *how* + adjective) behave like narrow reading amount questions (as noted in Rizzi, 1990, citing Baltin, 1992 and Roberts, 1988) and unlike wide reading amount questions:

(115)a. * How intelligent did she wonder whether she was
b. * How afraid of dogs did they ask if he was

Heycock takes this to suggest that the only (or the only accessible) interpretation degree questions tolerate is the narrow reading, that is that predicates must reconstruct. (If the wide reading was available, sentences in (115) should have the status of (114b) and not of (114a)).

Heycock further argues (following Kroch, 1989) that the unavailability of the narrow reading in amount or degree questions out of wh-islands is due to pragmatic infelicity rather than semantic deviance or ungrammaticality. Questions out of wh-islands they argue require that the questioned phrase ask the identity of an entity or entities presupposed to exist.[33]

[32] It is not relevant here why such a difference is observed. See the recent literature on Weak Islands for proposals.

[33] There are other proposals similar in spirit if not in detail to this idea (see Szabolcsi and Zwarts, 1993, for example

In the case of the wide reading question (114b) repeated below a, the presupposition would be what is given in b:

(116)a. ? How many songs do you wonder whether Sue will perform t
b. There are songs such that you wonder whether Sue will perform them

This should make it possible to rescue narrow readings for amount and degree questions out of wh-islands. First, Heycock (following Koch) argues that such contexts can be constructed that make amount questions or degree questions out of wh-islands more acceptable. Heycock's example is the following in a with its interpretation in b and it presupposition in c:

(117) a. How many points are the judges arguing about whether to deduct?
b. What is the number such that the judges are arguing about whether to deduct this number of points
c. There is a certain number of points that the judges are arguing about whether to deduct

Similar facts can be found in French. Normally, *combien*–split is sensitive to weak islands such as wh-islands or an intervening negation. In French, this is easier to check since we can guarantee the narrow reading by using *combien*-split. This type of context indeed makes the approximate translation of (117a) yields a relatively acceptable:

(118) Combien est-ce que les judges se demandent s'il faut déduire de points

We find similar contrasts for negative islands. The following sentence is hard to interpret

(119) * Combien est ce que Jean n'a pas emprunté de livres cet année?
How many hasn't John borrowed books this year

Out of context, there is no particular presupposition about there being a number of books that one should borrow. However, this sentence much improves if we utter it with the presupposition that there is a certain number of books that John has not borrowed this year.
Consider now the following asked in a context (familiar to French people) in which there is a small fixed number of competitive exams to take every year and every student decides which ones to take and which ones to opt out of. It is then perfectly natural to ask how many competitive exams John decided to opt out of as follows (with the intended interpretation in b):

(120)a. Combien est ce que Jean n'a pas passé de concours cette année[34]
How many hasn't John taken of competitive exams this year
b. What is the number / it is not the case that John took this number of exams this year

Extraction out of wh-islands of degree modified predicates can also easily be done. For example in the following context, sentence (121a) is fine :"According to reliable sources, Einstein's sister was just as well informed and just as smart as him and he was extremely proud of her. Just as well informed, I can believe but

(121)a. This smart, I wonder whether she was t

[34] Such facts show that there cannot be an absolute prohibition against certain types of quantifiers (*combien*) crossing over others (negation). This would call at the very least for refinements of approaches to these questions such as Rizzi's 1990 Relativized Minimality approach.

b. * This proud of Einstein's sister, I wonder whether he was t.
c. This proud of his sister, I wonder whether every student ever was t

We must make sure that sentence (121a) is not a case of wide reading but rather a case of felicitous narrow reading, since predicates must always reconstruct ruling out wide readings in degree questions in principle. First note that (121b) is still deviant. This shows that a copy of the predicate phrase is interpreted as reconstructed, but does not exclude the presence of an interpreted copy at the top as well. The well formedness of the third sentence (in an appropriate context) does show that such structures may be interpreted with no copy left at the top (otherwise we would have an unbound pronoun). This does not demonstrate that wide readings are unavailable for preposed predicates but at least shows that such examples as (121a) can be treated as case of narrow readings, i.e. as having the interpretation:

(122) there is an amount X such that, I wonder whether she was X smart

5.3.2 Definite Descriptions, Predicate Internal Subjects and Partial Reconstruction

Heycock also discusses the following contrasts:

(123)a. * [How afraid of some question Gore has not prepared for] do you think he is now ?
b. [How pleased with the pictures Pollock painted long ago] do you think he is now t

The unacceptability of the first example is predicted. Forced reconstruction

of the preposed predicate phrase puts *Gore* in the c-command domain of *he*, thus triggering a Condition C effect.
The acceptability of the second example is unexpected. To deal with this, Heycock suggests that the definite description *the pictures that Pollock painted long ago* can be assigned wide scope, deriving the representation:

(124) [The pictures that Pollock painted long ago]$_k$, how do you think he was pleased with t_k

Heycock remarks that if this wide scope reading becomes less plausible, a Condition C effect reappears. This is the case in (123a) in which it is most natural for the relative clause not to be interpreted with widest scope. The following contrasts is similar. Compare:

(125)a. How jealous of a girl that Mary had met at the party did she become
b. * How eager for a friend that Mary might confide in would she become

It is possible to interpret the underlined indefinite in the first sentence as having wide scope (there is a girl that Mary had met at the party, how jealous of her did she become). Such a wide scope reading for the indefinite is far less plausible for the second sentence.

Let us examine how this proposal can be reconciled with earlier conclusions. Consider again sentence (123b):

(126) [How pleased with the pictures Pollock painted long ago] do you think he is now

We must obligatorily reconstruct the predicate and its complement and scope out the definite description in such a way that it leaves no interpreted copy below the pronoun he. In this instance, this is possible because we need not reconstruct adjuncts and an adjunct contains the potentially offending name. This yields:

(127) [How the pictures Pollock painted long ago do you think he is pleased with these pictures] now

in which the lower copy does not contain the relative clause.
That this is on the right track seems supported by the following contrast between:

(128)a. [How pleased with the pictures an old painter you know painted long ago] do you think he is
b. * [How pleased with the pictures of an old painter you know] do you think he is

The difference between them is that the potentially offending name is contained in an adjunct in the first, and can thus fail reconstruct. In the second, it is part of the complement structure and thus must be reconstructed triggering a condition C effect.

Similarly, it is clear why the following sentence is a Condition C violation, given the only possible LF representation it could have:

(129)a. I gave him this picture of Bill yesterday
b. LF: [This picture of Bill]$_j$, I gave him this picture of Bill yesterday

However, the lack of obviation of Condition C effects in sentences such as in (130) is problematic. They would get the corresponding representations in (131) after scoping out of the definite description (leaving only copies of non adjunct material), and would thus be predicted to escape Condition C, contrary to fact:

(130)a. * He says that the man who an old painter met left
b. * She considers the book a European princess wrote to be unreadable
c. * I told him that the man who an old painter met left
d. * He_i wonders [how pleased with the pictures an old painter you know painted long ago] you are

(131)a. The man who an old painter met [he says that this man left]
b. The book a European princess wrote [she considers this book to be unreadable]
c. The man who an old painter met [I told him that this man left]
d. [The pictures an old painter you know painted long ago] He_i wonders [how pleased with these pictures] you are

One way out could be to restrict the distance that the definite description can scope over. If roughly it was clause bound, all these problems would disappear. This would predict however that the following example should still be fine (viz. its representation in b after scoping out of the definite description).

(132)a. Je lui ai donné la photo que le vieux peintre m'a demandée
b. I gave him the picture the old painter asked for yesterday
c. [The picture an old painter asked for], I gave him this picture

The French sentence (in a) given in English in b, is clearly much better than (129a) and is perfectly fine, particularly if read with such an intonation that the (underlined) direct object is backgrounded. This however may be an effect due to "extraposition" of the relative clause.
The following examples are sharply out:

(133) a. * Il m'a donné la photo que le vieux peintre m'a demandée
b. * He gave me the picture the old painter asked for yesterday
c. [The picture the old painter asked for], he gave me this picture
d. He [The picture the old painter asked for] gave me this picture

This suggests that if descriptions can scope out within their clause, leaving a copy optionally containing adjunct material, the distance this movement can span is quite restricted. Here the definite description must stay lower than a definite subject. Note that in the initial case (127), scoping of the definite description is from within a preposed wh-phrase.
Clearly this is an area for further research.

5.3.3 What drives Predicate Reconstruction?

The structure of (123b) under Huang's proposal is the following:

(134) [How t_j pleased with the pictures $Pollock_j$ painted long ago] do you think he_i is now t

This would seem incompatible with Huang's proposal, Heycock claims. The presence of t_j coindexed with *he* should trigger a Condition C effect (whether Condition C is an anywhere Principle or only applies at LF). Under a theory assuming that Condition C cannot be violated anywhere such

examples are clearly incompatible with Huang's proposal since at some level, t_j c-command *an old painter*. But this problem is more general: this sentence poses a problem for any account assuming that the preposed predicate obligatorily reconstructs in its entirety to t, putting *Pollock* in the c-command domain of *he*. To get around this problem, Heycock suggests that definite descriptions can scope out. If Heycock 's proposal is on the right track and the Logical Form representation of (134) is:

(135) The pictures Pollock painted long ago [how do you think he_j is t_j pleased with these pictures]

the problem Heycock points out for Huang's proposal is also solved by her proposal under the assumption that Condition C only applies at LF: once the definite description has been scoped out and the adjunct is not reconstructed, there is no longer a Condition C violation regardless of the presence of a predicate internal subject. We conclude that the Huang/Takano proposal can be maintained..

In Heycock (1985), one additional problem is mentioned regarding Takano's modification of Huang's proposal we have been discussing. The following examples of degree questions allow coreference:

(136)a. How much longer than your yacht actually is did John think it was
b. How much more intelligent than John actually is did he say he was

Of course, this would be a problem if Condition C is an anywhere principle. Is it under the assumption that condition C only applies at LF? To decide whether this indeed constitutes a problem, we must examine what their Logical Forms can be. In the b case for example, the *than* clause is a dependent of *more*. (In its absence the *than* clause can not be present). Thus,

the following representation for this amount representation seems reasonable:

(137) What is the degree D added to the degree to which John is actually intelligent such that he said he was D intelligent

This makes it basically a narrow reading amount question on a degree in which no LF violation of Condition C should occur (the wh-question bears on a degree increase, but the predicate *intelligent* has narrow scope). As Heycock remarks, that this is an narrow reading amount question is corroborated by the fact that such questions become unacceptable when originating inside a wh-island:[35] [36]

(138) *How much more intelligent than he is do you wonder whether he was

6 Summary and Conclusion

We begin by a summary of the conclusions we reached first descriptively then regarding the accounts that these descriptive generalizations seem to suggest in a Principle and Parameters type of model.

[35] By the Heycock/Kroch proposal mentioned in the text, they should be meliorated in a context with the right presupposition.

[36] Heycock mentions one more example of the same kind. She gives: (i) **How much faster than John did he see Mary running*, but speakers rejected even a variant of it without coreference due to the clash between the tense of the elided VP and its antecedent (running). If the tense clash is resolved as in (ii) *How much faster than John did does he think Mary ran* the sentence seems fine. Note also that the underlined part would be barred from reconstructing all the way down because it would be a paradoxical antecedent contained deletion structure.

Descriptively, we concluded that:

- We find reconstruction effects for Scope, Pronominal Binding and all binding conditions in all types of movement constructions.
- Reconstruction for preposed predicates is always required, with consequences for all relevant conditions: condition A, condition C, scope, pronominal binding.
- Regarding Condition C, reconstruction is obligatory sometimes and optional other times. We took the relevant factor to be a complement /adjunct distinction, but it is not fully established that this is the relevant distinction.
- Reconstruction for Condition A, scope and pronominal binding is possible but not required.
- Reconstruction effects correlate to a certain extent: reconstruction for pronominal binding and scope either both take place or both do not.
- If reconstruction for scope or pronominal binding takes place, reconstruction for Condition C does too (this is only relevant for cases optional reconstruction for condition C , that is only regards adjuncts).
- Reconstruction effects however do not always correlate: Reconstruction may take place for Principle C without doing so for scope.
- We also documented cases of impossible reconstruction which we left unexplained.

We construed these descriptive generalizations as follows:

- All binding conditions and scope computation must be computed on the basis of representations that serve as input for semantic interpretation which we define as Logical Form. We also concluded

that it makes little sense for scope or pronominal binding (in effect a scope principle) to be evaluated anywhere else (at best it would be redundant). We reached similar conclusions for Condition A (although it should be noted that we did not discuss potentially relevant differences between reflexives and reciprocals).

- We also concluded that Condition C cannot hold of underlying structures but may of surface structures (depending on the treatment of antecedent contained deletion, the correctness of the Huang/Takano approach among other things).
- We concluded that mismatch of scope and binding reconstruction patterns could be handled by taking traces to be copies and requiring that bottom (or bottommost) copies always be interpreted at LF.
- We tentatively attributed the obligatoriness of reconstruction for preposed predicates to the Huang/Takano hypothesis, and the idea that interpreted traces (which are lower copies) behave as bound variables (and are thus subject to the condition on pronominal binding).

It is worth noting that these conclusions are consistent with Chomsky'1995 proposal requiring all binding conditions to be Logical Form conditions only.

Regarding the properties of movement, we reached the following conclusion regarding how to construe the basic operation Move, and its interaction with LF principles of scope:

- Movement is copying
- Either or both copies can be interpreted at LF:
- The position determining the scope of an XP is that of its highest interpreted copy.

i. if only the lower copy of an XP is interpreted, this XP receives narrow scope
ii. if the top copy of an XP is interpreted, this XP receives wide scope

Among the issues left unresolved are the existence and exact properties of covert movement (although we have been led to the assumption that covert scoping out is possible, e.g. for definite descriptions), the impact of the analysis of relative clauses on the theory of reconstruction, the behavior of reflexives.

Descriptively, there are a number of questions we have not discussed. We have not talked about reconstruction effects for negative or positive polarity item licensing (see Den Dikken et al., 2000 for some relevant discussion). We also did not discuss properties of reconstruction documented in other languages (e.g. in Arabic, see Aoun and Benmamoun, 1998, British English, see Elbourne, 1999 or Japanese, see Saito, 1989 on Scrambling). Theoretically, we have limited ourselves to implementing the assumed descriptive generalizations in a Principle and Parameters type framework but we have of course not discussed all approaches to reconstruction within it. Among recent works that were not discussed here, there are approaches assuming PF movement (e.g. Aoun and Benmamoun, 1998, Sauerland and Elbourne, 2002); the work of Safir (1999) which incorporates ideas about vehicle change originally proposed in May and Fiengo (1994) into the treatment of reconstruction effects (by treating lower copies as pronominals for example).
Putting the burden of the treatment of reconstruction effects on the semantic rules themselves rather than on the syntactic input to these interpretative rules is done in flexible composition rules approaches such as Jacobson (1999) or Sharvit (1998).

More distant treatments of reconstruction effects can be found in McCawley (1999) within generative semantics.

As mentioned at the outset, it remains to be seen to what extent these alternatives are truly different from what we have covered in the logical structure of the proposals that they make.

7 References

Aoun, Joseph, and Elabbas Benmamoun. 1998. Minimality, Reconstruction, and PF movement. *Linguistic Inquiry* 29, 569–597.

Baltin, Mark. 1992. On the Characterization and Effects of D-Linking: comments on Cinque. Robert Freidin, ed., *Current Issues in Comparative Grammar*, Kluwer, Dordrecht, 249-256.

Barss, Andrew. 1986. *Chains and Anaphoric Dependencies*, PhD Dissertation, MIT.

Barss, Andrew. 1988. Paths, Connectivity and Featureless Empty Categories. *Constituent Structure*, Anna Cardinaletti, Guglielmo Cinque and Guliana Giusti eds., 9-34, Reidel, Dordrecht.

Belletti, Adriana and Luigi Rizzi. 1988. Psych Verbs and Theta Theory. Natural Language and Linguistic Theory 6, 291 -352.

Bouchard, Denis. 1984. *On the Content of Empty Categories*, Foris, Dordrecht.

Brody, Mishi. 1995. *Logico-lexical Form*. MIT Press, Cambridge, Mass.

Burzio, Luigi. 1986. *Italian Syntax*, Reidel, Dordrecht.

Chomsky, Noam. 1986. *Knowledge of Language: Its Nature, Origin, and Use.* Praeger, New York.

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

Cinque, Guglielmo. 1984. A-bar Bound Variable vs. pro. Manuscript,

Università di Venezia.
Cinque, Guglielmo. 1991. *Types of A -bar Dependencies.* MIT Press, Cambridge, Mass.
Cresti, Diana. 1995. Extraction and Reconstruction. *Natural Language Semantics* 3, 79-122.
Den Dikken, Marcel, A. Meinunger & Chris Wilder. 2000. Pseudoclefts and Ellipsis. *Studia Linguistica* 54: 41-89
Dobrovie-Sorin, Carmen. 1992. *The Syntax of Romanian: Comparative Studies in Romance*. Foris, Dordrecht.
Elbourne, Paul. 1999. Some correlations between semantic plurality and quantifier scope. In *Proceedings of NELS 29*, ed. by P. Tamanji et al., 81–92. Amherst, GLSA, University of Massachusetts.
Fox, Danny. 2000a. *Economy and Semantic Interpretation*. Cambridge, Mass.: MIT Press.
Fox, Danny. 2000b. Antecedent contained deletion and the copy theory of movement. Manuscript, Harvard University, Cambridge, Mass.
Fox, Danny and Jon Nissenbaum. 1999. Extraposition and Overt QR, WCCFL 18.
Fox, Danny and Jon Nissenbaum. 2002. Condition A and Scope Reconstruction, ms., MIT and Harvard University.
Freidin, Robert. 1986. Fundamental Issues in the Theory of Binding. *Studies in the Acquisition of Anaphora*, Barbara Lust ed., 151-188, Reidel, Dordrecht.
Heycock, Caroline. 1995. Asymmetries in Reconstruction. *Linguistic Inquiry* 26, 547-570.
Heycock, Caroline and Anthony Kroch. 1999. Pseudoclefts Connectedness: Implications for the LF Interface Level. *Linguistic Inquiry* 30, 365-398.
Heim, Irene, Howard Lasnik and Robert May. 1991. Reciprocity and Plurality, *Linguistic Inquiry*, 22, 63-102.
Huang, C. -T James. 1993. Reconstruction and the Structure of VP.

Linguistic Inquiry 24.1, 103-138.
Jacobson, Pauline. 1999. Towards a variable-free semantics. *Linguistics and Philosophy* 22.117–184.
Kayne, Richard. 1994. *The Antisymmetry of Syntax. MIT Press*, Cambridge, Mass.
Kroch, Anthony. 1989. Amount Quantification, Referentiality and Long wh-Movement, ms. University of Pennsylvania, Philadelphia.
Kuno, Susumo. 1997. Binding Theory in the Minimalist Program. Unpublished ms. Harvard University.
Lasnik, Howard. 1998. Some Reconstruction Riddles. In *Proceedings of the 22nd Annual Penn Linguistics Colloquium*, Alexis Dimitriadis, Hikyoung Lee, Christine Moisset, and Alexander Williams eds., p. 83-98, University of Pennsylvania, Penn Linguistics Club.
Lebeaux, David. 1983. A Distributional Difference between Reciprocals and Reflexives, *Linguistic Inquiry*, 14, 723-730.
Lebeaux, David. 1988. *Language Acquisition and the Form of Grammar*, PhD Dissertation, University of Massachusetts, Amherst.
Lebeaux, David. 1991. Relative Clauses, Licensing and the Nature of Derivations. *Phrase Structure*, Heads and Licensing, Susan Rothstein and Margaret Speas eds., Syntax and Semantics 25, Academic Press.
Lebeaux, David. 1998. Where does the Binding Theory Apply? Technical Report, NEC Research Institute, NEC.
May, Robert. 1985. *Logical Form*. MIT press, Cambridge, Mass.
May, Robert and Robert Fiengo. 1994. *Indices and Identity*, MIT Press, Cambridge, Mass
McCawley, James D. 1999. Why surface syntactic structure reflects logical structure as much as it does, but only that much. *Language* 75.34–62
Nissenbaum, Jon. 2000. *Investigations of Covert Phrase Movement*. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
Obenauer, Hans Georg. 1994. *Aspects de la Syntaxe A-barre*, Thèse de

Doctorat D'Etat, Université de Paris VIII.

Pollard, Carl and Ivan Sag. 1992. Anaphors in English and the Scope of the Binding Theory, *Linguistic Inquiry,* 23, 261-305.

Reinhart, Tanya and Eric Reuland. 1993. Reflexivity, *Linguistic Inquiry,* 24.4, 657-720.

van Riemsdijk, Henk and Edwin Williams. 1981. NP-Structure, *The Linguistic Review* 1, 171-217.

Rizzi, Luigi. 1990. *Relativized Minimality*, MIT Press, Cambridge, Mass.

Rizzi, Luigi. 2000. Reconstruction, Weak Island Sensitivity and Agreement, unpublished ms., Università di Siena.

Roberts, Ian. 1988. Thematic Interveners, Rivista di Grammatica Generativa 13, 111-136.

Romero, Maribel. 1997. . The Correlation between Scope Reconstruction and Connectivity Effects. E. Curtis, J. Lyle and G. Webster. eds.. , Proceedings of the XVI West Coast Conference in Formal Linguistics. Seattle, 28 February – 2 March 1997. . Stanford: CSLI Publications. 351-366.

Safir, Ken. 1999. Vehicle change and reconstruction in A-bar chains. *Linguistic Inquiry* 30.587–620.

Saito, Mamoru. 1989. Scrambling as semantically vacuous A0-movement. In *Alternative Conceptions of Phrase Structure*, ed. by M. Baltin and A. Kroch, 182–200. Chicago: University of Chicago Press.

Sauerland, Uli. 1999. Scope reconstruction without reconstruction. In *Proceedings of WCCFL 17*, ed. by K. Shahin et al., 582–596. Stanford, Calif., CSLI.

Sauerland, Uli and Paul Elbourne. 2002. Total Reconstruction, PF Movement, Derivational Order. Linguistic Inquiry 33.2, 283-320.

Schlenker, Philippe. 2003. Clausal Equations. A Note on the Connectivity Problem. Natural Language and Linguistic Theory 21: 157-214.

Sharvit, Yael. 1998. Possessive wh-expressions and reconstruction. In *Proceedings of NELS 28*, 409–423. Amherst, University of Massachusetts, GLSA.

Sharvit, Yael. 1999. Connectivity in specificational sentences. *Natural Language Semantics* 7.299–339.

Sportiche, Dominique. 1997. Reconstruction and Constituency, talk given at MIT, Cambridge, Mass.

Sportiche, Dominique. 1999. Reconstruction, Constituency and Morphology, talk delivered at the 1999 GLOW conference, Berlin.

Sportiche, Dominique. 2000. Sources for Relative Clauses. ms, UCLA.

Sportiche, Dominique. 2003. Some apparent paradoxes in Reconstruction. Ms, UCLA.

de Swart Henrietta. 1998. Introduction to Natural Language Semantics, CSLI Publications, Stanford, California.

Szabolcsi, Anna and Franz Zwarts. 1993. Weak islands and an Algebraic Semantics of Scope Taking, *Natural Language Semantics* 1, 235-284.

Takano, Yuji. 1995. Predicate fronting and internal subjects. *Linguistic Inquiry* 26.327–340.

Vergnaud, Jean Roger. 1974. *French Relative Clauses*. Doctoral Dissertation. MIT.

Williams, Edwin.. 1980. Predication, *Linguistic Inquiry* 11, 203 -238.

Williams, Edwin. 1986. A Reassignment of the Functions of LF. *Linguistic Inquiry* 17, 265-299.

Zubizaretta, Maria Luisa. 1982. *On the Relationship between the Lexicon and Syntax*. Doctoral Dissertation. MIT.