Available online at www.sciencedirect.com
ScienceDirect
Lingua 117 (2007) 202–220
Lingua
www.elsevier.com/locate/lingua

Matching and raising unified

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Received 21 April 2005; received in revised form 15 December 2005; accepted 21 December 2005
Available online 10 March 2006

Abstract

For nearly 30 years it has been assumed that some English relatives require a movement relationship between the external head noun phrase and its clause-internal position (the raising analysis) whereas other relatives do not allow such a relationship (the matching analysis). This division has largely been motivated by reconstruction facts. This paper argues that the matching analysis is eliminable if one assumes vehicle change is a general property of A-bar movement, and if one accepts that sentence construction and movement are derivational while chain formation is representational. This allows a uniform raising analysis for English relatives that eliminates difficulties with previous raising analyses, allows relative clauses to be uniformly treated as adjuncts, and accounts for otherwise mysterious extraposition facts. The conclusions also have implications for the idea that adjuncts may be merged acyclically in a derivation.

Keywords: Matching; Raising; Relative clauses; Vehicle change; Sideward movement; Late merger; Extraposition

1. Introduction

Since Carlson (1977), it has been recognized that two LF structures are needed to describe English relative clauses. Over the years, this has translated into two syntactic derivations, the so-called raising analysis (largely ignored until its revival by Kayne (1994)) and its counterpart the matching analysis. In this paper, I review the empirical motivations behind this division and argue that, given certain assumptions, the dual derivational perspective is unnecessary. Rather, I will propose that all English relatives are derived by raising. In doing so, I will also resolve some theory-internal problems with the standard analyses of relatives, one of which has not been discussed until now.

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0024-3841/$ – see front matter
doi:10.1016/j.lingua.2005.12.002

This paper proceeds as follows: in section 2 I offer a brief history of the matching and raising analyses, paying particular attention to recent work by Sauerland (1998, 2000) that leads to a new view of matching. In section 3 I argue that the matching analysis should be eliminated from the theory, adopting Safir's (1999) suggestion that vehicle change should be considered a general property of A-bar movement. In section 4 I examine the derivational status of relative clauses as adjuncts in light of the idea that adjuncts may be late merged (acyclically) in the derivation. I show that the latter idea presents a serious problem for the raising analysis of relatives, a problem I term the *raising paradox*. In section 5 I offer a new analysis for relatives based on Nunes' (2004) notion of sideward movement, demonstrating that it resolves the *raising paradox* as well as other theory-internal problems. In section 6 I review the behavior of relative adjuncts in extraposition contexts as presented in Fox and Nissenbaum (1999) and Hulsey and Sauerland (2002), demonstrating that my analysis makes correct predictions where Hulsey and Sauerland's analysis does not. Section 7 offers brief comments on a dichotomy between NP and VP adjuncts with regard to late merger, and section 8 offers the conclusion.

2. Matching and raising: a brief history

Since Carlson (1977) it has been assumed that two LF structures are required to capture all the facts of English relative clauses. I adopt the standard terminology and refer to these two derivations as *matching* and *raising*. These two structures differ as to whether or not the external head of the relative clause is in a transformational relationship with the internal argument position of the clause. In raising relatives, it is assumed that there is such a relationship. The evidence for raising is that some relative clauses require their external head to be interpreted inside the clause.[1] The standard cases are verb-complement idiom interpretation, Condition A, and variable binding[2]. Since verb-complement idioms must be interpreted as a unit, it must be the case that the external head in (1a) is interpreted in the complement position within the clause. With regard to the other two criteria, both anaphors and bound variables must be c-commanded by their respective binders for interpretation to be possible.[3] Therefore, in (1b–c) it must be that the external head that contains these elements is interpreted in a clause-internal position that is c-commanded by the subject.

(1) a. *Idioms*: The headway that John made <headway> was impressive.
b. *Condition A*: The portrait of himself$_i$ that John$_i$ painted <portrait of himself$_i$> really captured his essence.
c. *Variable Binding*: The photo of his$_i$ mother that every student$_i$ brought in <photo of his$_i$ mother> were used in the project.

Within the minimalist program, it has been assumed that one way to explain such reconstruction effects is to assume the copy theory of movement. In that theory, movement occurs by the operations *Copy*, where a copy is made of a particular lexical item, and *Merge*, which merges the copy of the item into the derivation. Reconstruction occurs when copies lower than the

[1] A review points out that another good argument for raising is that the raising analysis allows for a generalization of externally and internally headed relative clauses. I do not discuss the latter in this paper.

[2] See Bhatt (2002) for an additional argument for the raising analysis concerning the interpretation of adjectives modifying the head noun of a relative clause.

[3] Questions have been raised about the legitimacy of Condition A as a reliable test for reconstruction, and thus raising (see Reinhart and Reuland, 1991 for discussion). Though, as a reviewer points out, R&R's view on logophoricity is highly controversial, I will attempt to avoid the question by employing examples based on idiom interpretation as often as possible.

surface position of the moved element are interpreted. I adopt this system throughout this paper. In (1), the copies in brackets are unpronounced, but must be interpreted for the derivations to converge.

The recognition that a raising analysis is necessary for cases such as (1) goes back to Brame (1968) and Vergnaud (1974) and was successfully revived in Kayne (1994). Kayne's analysis involves an external determiner D taking the relative CP as its complement. Within the CP, the head of the relative undergoes movement from its base position to Spec,CP.[4]

(2) $[_{DP}$ the $[_{CP}$ $[_{NP}$ headway$]$ that $[_{TP}$ John $[_{VP}$ made t$]]]]$

The movement relation between the head of the relative clause and the argument position within the clause in (2) allows for the possibility that the head NP can be interpreted in the clause-internal argument position. This lines up with similar facts from wh-question constructions. In (3) the requirements of idiom interpretation, anaphora and variable binding are met by reconstruction just as they are in the relative clauses in (1):

(3) a. What headway did John make <headway> today?
b. Which picture of himself$_i$ did John show you <picture of himself$_i$>?
c. Which photo of his$_i$ mother did every student$_i$ bring <photo of his mother>?

These facts suggest that reconstruction is available in A-bar movement contexts more generally. However, there appears to be a difference between relative clauses and wh-movement constructions with regard to Condition C effects. Namely, the complement of a wh-moved element in a wh-question may trigger a Condition C effect while complements of relative-moved elements may not:

(4) a. *Which picture of John$_i$ did you think he$_i$ liked?
b. The picture of John$_i$ that you thought he$_i$ liked is on the mantle.

In section 3 I will suggest that the contrast in (4) is not as robust or theoretically significant as it has been taken to be. Accepting it for expository purposes, however, this asymmetry is mysterious under the assumption that relatives are derived analogously to wh-questions. In the wh-question in (4a), the lower copy of *picture of John* is c-commanded by the subject *he*. Therefore, a Condition C violation occurs. If the relative clause in (4b) were derived similarly, we would expect the same effect. The fact that there is no such effect has been taken as evidence that the head NP of relatives such as (4a) is not related to the clause-internal argument position by movement as it is in relatives like those in (1). Rather, a distinct derivation is required. This is what is referred to as the matching derivation.

Matching relatives are derived by the adjunction of a relative CP to an external noun phrase. For a long time, it was (and often still is) assumed that an empty operator within the CP moves from the argument position to Spec-CP where it can ''match'' with the external noun phrase.

[4] Though I chiefly discuss that-type relatives in this paper, I will also assume that relative clauses involving relative pronouns may also receive a raising analysis following Kayne (1994). See Bianchi (1999) and De Vries (2002) for extensive discuss of this view. See also footnote 14.

(5) $[_{DP}$ the $[[_{NP}$ picture of John$_i]_k$ $[_{CP}$ *Op*$_k$ that $[_{TP}$ he$_i$ $[_{VP}$ likes t$]]]]]$

Recently, however, Sauerland (1998, 2000) has shown that (5) cannot be the correct derivation for matching relatives. Based on evidence from doubly headed antecedent contained deletion and crossover effects, he demonstrates that there is an identity relationship between the external head and the internal operator in matching relatives. Therefore, the internal operator cannot be empty. It must in fact be identical or nearly identical to the external head. The required structure is that in (6).[5]

(6)

$[_{DP}$ the $[[_{NP}$ picture of John$_i]$ $[_{CP}$ $[_{NP}$ picture of John$_i]$ that $[_{TP}$ he$_i$ $[_{VP}$ likes $[_{NP}$ picture of John$_i]]]]]]$

As Sauerland notes, however, if (6) is the correct structure for matching relatives, the question of how Condition C is obviated in such relatives arises anew since in (6) the lower copy of *John* is c-commanded by the coindexed subject pronoun. Sauerland's solution to this problem is to adopt the mechanism of vehicle change.

Vehicle change was developed by Fiengo and May (1994) as a way to explain why elided verb phrases that contain R-expressions do not trigger Condition C effects. To see the problem, observe the VP ellipsis context in (7).

(7) Lara loves Sol$_i$ and he$_i$ thinks that Sally does <love Sol$_i$> too.

Assuming that VP ellipsis is licensed under identity between the two VPs, the lower VP should contain the same R-expression contained by the higher VP. Since the lower VP is c-commanded by a coindexed pronoun, a Condition C effect should surface. In fact, if the lower VP is not elided, it does surface. With ellipsis, however, it does not.

Since ellipsis is assumed to be a PF process that does not affect semantic interpretation, we cannot assume that ellipsis saves the derivation from the Condition C effect. Something else is needed. Fiengo and May propose that the mechanism at work here is vehicle change. Vehicle change allows an R-expression in an ellipsis context to be interpreted as a pronoun with an index that is the same as the R-expression would have. The LF representation for (7), then, is really (8):

(8) Lara loves Sol$_i$ and he$_i$ thinks that Sally does <love him$_i$> too.

[5] Though I have used the term *matching* to refer to the empty operator analysis, for the remainder of the paper I use this term to refer to Sauerland's revision of this analysis. It should also be noted, as a reviewer points out, that Sauerland's instantiation of the matching analysis can account for the reconstruction facts in (1) traditionally taken to motivate the raising analysis. This is so because the full lexical information of the relativized NP is present within the relative clause (as opposed to a null operator). Indeed, one of the goals of Sauerland (1998) is to argue that a raising analysis is not required in the light of his revisions to the matching approach. The present work can be seen as an attempt in the opposite direction.

The introduction of vehicle change predicts that while Condition C effects are obviated in these contexts, we should be able to induce Condition B effects with the pronominal in the elided VP. As Fiengo and May demonstrate, this is the case:

(9) a. *Amy introduced $Jack_i$ to everyone and he_i introduced him/$Jack_i$ too.
b. *Amy introduced $Jack_i$ to everyone and he_i did too.

Returning to relative clauses, Sauerland applies the mechanism of vehicle change to matching relatives like the one in (6), arguing that deletion of the lower copies in a matching relative is a lot like deletion of lower VPs in VP ellipsis. Both are instances of deletion under an identity requirement. Therefore, if vehicle change is available in one context, it should be available in the other.

Vehicle change solves the Condition C problem for Sauerland's proposal. Now the structure for matching relatives is as in (10):

(10)
$[_{DP}$ the $[[_{NP}$ picture of $John_i]$ $[_{CP}$ $[_{NP}$ picture of $him_i]$ that $[_{TP}$ he_i $[_{VP}$ likes $[_{NP}$ picture of $him_i]]]]]]$

I will take (2) and (10) to illustrate the present state of the raising and matching analyses, respectively. Note that of the two analyses presented here, the matching analysis is more stipulative since it requires the adoption of both an LF matching procedure (whose properties are far from clear) and the adoption of vehicle change, a mysterious operation that only seems to be available in matching relatives and VP ellipsis contexts.[6] In section 3 I will argue that the matching analysis should be dispensed with, thus eliminating the LF matching procedure from the derivation of relative clauses. With regard to vehicle change, I will follow Safir (1999) in arguing that it should be extended to include all instances of A-bar movement, making it no less stipulative, but perhaps more amenable to explanation.[7]

3. Eliminating matching

Recall that the argument for the matching analysis is based on the following contrast:

(11) a. *Which picture of $John_i$ did you think he_i liked?
b. The picture of $John_i$ that you thought he_i liked is on the mantle.

(11a), the argument goes, demonstrates that reconstruction is obligatory in A-bar contexts; therefore, it must be the case that the relative head in (11b) does not undergo A-bar movement

[6] See Fults (2004) for convincing arguments that matching in comparative constructions and in relatives is not analogous to matching in VP ellipsis contexts.

[7] See Aoun and Nunes (2002) for an analysis of vehicle change in terms of feature movement, one that would seem to be incompatible with the roles Sauerland and Safir take vehicle change to play.

from the base position since it does not trigger a Condition C effect. Thus, a matching structure is required.

While the logic of this argument is sound, several authors have questioned the empirical robustness of the contrast in (11). Complements to wh-phrases in questions, they observe, do not always exhibit Condition C effects. In fact, only in very few cases are such judgements strong. Safir (1999) cites (12a–d) from Kuno (1997) and (12e) from Higgenbotham (1983:411)[8]:

(12) a. Which witness's attack on Lee_i did he_i try to get expunged from the trial records?
b. Whose criticism of Lee_i did he_i choose to ignore?
c. Which evaluation of Lee's$_i$ physical fitness did he_i use when he applied to NASA for space training?
d. Whose allegation that Lee_i was less than truthful did he_i refute?
e. Which article about $Picasso_i$ do you think he_i wants to read?

My own judgements are that all of these examples are quite acceptable and I have found that the contrasts that many speakers find with such sentences disappear after only a few seconds of considering the examples. Indeed many speakers I interviewed even found the starred example in (11a) to be acceptable.

Note that any example of a complement to a wh-phrase obviating Condition C effects is unexpected under the assumption that an exact copy of the complement resides in the base position. The fact that Condition C is often obviated in such structures tells us that something else is going on here. Safir (1999) suggests that the answer is Fiengo and May's (1994) vehicle change. Rather than being limited to deletion under identity contexts, Safir posits that vehicle change is always available to lower copies in A-bar chains. Thus in principle, Condition C alleviation is always available for A-bar moved elements. In cases where it does not seem to be alleviated, another explanation is required. Safir cites Kuno's (1997) suggestion that a pragmatic effect may be at work in these cases. I do not have room here to evaluate Kuno's claims or to explore what factors may be at work in yielding Condition C effects in some cases of nominal complements.[9,10] For my purposes, however, this is unimportant. Rather, I will follow those cited in assuming that the Condition C effects in some of the examples above do not constitute an anti-reconstruction effect. Instead, I will assume with Safir (1999) that vehicle change is always available in A-bar movement contexts. In other words, A-bar movement alone will never trigger a Condition C effect.

With this assumption, the contrast in (11), if indeed it exists at all, is not due to the possibility of movement or reconstruction, but rather to independent factors. In principle, there is no contrast between relative heads and wh-movement phrases with regard to reconstruction: neither trigger Condition C effects. The wh-question obviates Condition C effects via vehicle change in the

[8] See Bianchi (1999) and Postal (1997) for further observations that judgments of ungrammaticality for sentences like (12) are weak or non-existent.

[9] A reviewer points out that many of the examples in (12) involve pied-piping a possessor, suggesting this may be a factor in increasing acceptability. The implications of this are not clear to me and clearly more work is needed before an explanation of Condition C violation/obviation can be offered.

[10] Kuno (1997) suggests the *Logophoric NP Constraint* to account for the cases Principle C is not obviated. This constraint prevents coreference between a name and a c-commanding antecedent when the name is within a complement that "represents the thought of the referent of the main clause constituent NP, or the utterance transmitted by or to the referent of such an NP."

lower copy of the moved phrase. There is no reason not to assume that this is also the case for the relative clause in (11b). If that is the case, then even matching relatives like (11b) can be derived via raising. The LF structures for (11b) and a grammatical wh-question with an R-expression in its complement are given below:

(13) a. [$_{DP}$ Whose criticism of Lee$_i$] did he$_i$ choose to ignore [$_{DP}$ whose criticism of him$_i$]

b. [$_{DP}$ The picture of John$_i$] that you thought he$_i$ likes [$_{DP}$ picture of him$_i$]

As (13b) demonstrates, if Condition C is not a diagnostic for the matching analysis, then there is no reason to assume such an analysis is needed. Relatives like (13b) can be derived by raising just as relatives involving idioms or variable binding are. I conclude that the matching analysis is unnecessary and should be eliminated from the theory. Instead, I propose that all English relative clauses are derived via raising. This move is desirable since, as noted above, the matching analysis requires the stipulation of an LF matching procedure. The present analysis makes that stipulation unnecessary.

Having concluded that all headed relatives in English are derived by raising, I now turn to address what the exact derivation for these relatives could be. For this, it will be helpful to begin with a discussion of the adjunct status of relative clauses and I turn to this in the next section.

4. Vehicle change and the late merger of adjuncts

Safir's (1999) adoption of vehicle change as a property of A-bar movement is presented in the context of a contrast noted by Freidin (1986) and Lebeaux (1988, 1990) and termed the *Freidin–Lebeaux Generalization* (FLG) by Safir. The FLG observes that while complements of wh-phrases may trigger Condition C effects, adjuncts to the same phrases do not:

(14) a. *Which claim that John$_i$ was wrong did he$_i$ accept?
b. Which claim that John$_i$ made did he$_i$ regret?

Lebeaux proposes that the contrast in (14) arises from derivational restrictions. While complements must be merged cyclically into the derivation (due to thematic requirements and the Projection Principle), adjuncts may be acyclically merged.[11] Thus, in (14a) the complement *that John was wrong* must be present in the base position of the wh-phrase where it is c-commanded by the coreferential pronominal and induces a Condition C effect. In (14b), however, the adjunct *that John made* may be merged after wh-movement has taken place. Since it is not present in the base position, no Condition C effect is triggered:

[11] But see Heycock (1993) for an alternative view that takes referential/non-referential to be the relevant distinction rather than argument/adjunct. Thanks to a reviewer for bringing this view to my attention.

(15) a. *[Which claim [that John$_i$ was wrong]] did he$_i$ accept <which claim [that John$_i$ was wrong]>
b. [Which claim [that John$_i$ made]] did he$_i$ regret <which claim>?

As we have seen, however, the ungrammaticality of examples like (14a) is highly questionable and most of the speakers I interviewed found (14a) at least somewhat acceptable. Under the assumption that vehicle change is available in all A-bar movement contexts, the LF structure for (14a) does not contain a copy of *John* but rather a pronominal *him*. Therefore, the Condition C effect, strong or weak as it may be, does not arise from the presence of the R-expression in the lower copy, but from independent factors.

The conclusion that the Freidin–Lebeaux Generalization is somewhat of an illusion may lead us to the conclusion that the late merger of adjuncts is also not a necessary assumption to adopt. However, there is independent evidence that adjuncts are in fact merged acyclically. First, as Safir (1999) notes, while it is true that few complements to wh-phrases yield strong Condition C effects, it is also true that no speakers find any Condition C effects at all with adjuncts to wh-phrases. Thus, a distinction between complements and adjuncts to wh-phrases is still required. Safir proposes that Condition C effects may arise with complements to wh-phrases in situations where vehicle change fails to apply (for whatever reason). Adjuncts to wh-phrases, however, are late-merged. Therefore, there is no copy of the adjunct in the base position of the wh-phrase for vehicle change to fail to apply to. Thus, there is no possibility of a Condition C violation where adjuncts are involved.

A second and completely independent argument for the late merger of adjuncts is presented by Fox and Nissenbaum (1999) based on facts from extraposition. This argument will be directly relevant for an explanation of certain facts discovered by Hulsey and Sauerland (2002) and I discuss it in section 6.

To summarize the discussion so far, we have seen that the argument for a matching analysis disappears once Condition C violations are better understood empirically. The heads of relative clauses, it was argued, are uniformly derived via raising. When these heads contain an R-expression, they are able to obviate Condition C effects by the mechanism of vehicle change, here understood as a general property of A-bar movement. The latter assumption also diminishes the contrast between complements and adjuncts of wh-moved phrases with regard to Condition C. However, it was argued that a contrast does exist since Condition C effects are sometimes seen with complements, but never with adjuncts. This is explained by the assumption that adjuncts are uniformly late merged in the derivation.

This state of affairs, however, leads to a serious difficulty. In particular, the conclusions that all English relatives are derived via raising means that the heads of all relative clauses must be merged in their relative clause-internal theta positions. However, I also adopted the assumption that adjuncts are uniformly late-merged. Taking the traditional assumption that relative clauses are indeed adjuncts, these two assumptions lead to what I have termed the *raising paradox*.

(16) The *raising paradox*:
a. The heads of relative clauses must be merged cyclically.
b. The heads of relative clauses originate within the relative clause that modifies them.
c. Relative clauses must be late merged (acyclically).

To my knowledge, this paradox has not been discussed until now, but it is implicit in any analysis that assumes the late merger of adjuncts and the adjunct status of relative clauses. In the next section, I will offer a resolution to this paradox that relies on Nunes' (2004) understanding of the copy + merge theory of movement.

5. Raising relatives and sideward movement

Nunes (2004) explores the boundaries of the copy + merge theory of movement. In that theory, the operation traditionally referred to as 'Move' is decomposed into four operations that are in principle independent. These are Copy, Merge, Form Chain, and Chain Reduction. The operation Copy copies an item in the derivation. Merge adds an item (either a 'new' item from the numeration ('external merge'), or a copy of an item already in the derivation ('internal merge')) to the derivation. At the end of a derivation, Form Chain applies, forming chains between copies that are in a c-command relationship. Finally, at the interface levels, Chain Reduction applies. With regard to PF, Chain Reduction eliminates links of a chain to ensure that only one is pronounced.

One of Nunes' crucial insights is that if all four of the operations above are in principle independent, nothing requires that a copy of an item from within a particular syntactic object be (re)merged to that same object. Rather, a copy of an item from one derivational object could just as easily be merged to a distinct object. In (17), K is a syntactic object containing lexical item α. L is a distinct syntactic object. In (17a) α is copied. In (17b) α is merged with L to form the extended object M.

(17) a. [K…α_i…] α_i [L…]

Copy

b. [K…α_i…] [M…α_i [L…]

Nunes refers to this possibility as 'sideward movement.' The constraints on such movement are provided by Form Chain, an operation that forms chains representationally at the end of a derivation, and Chain Reduction.[12] By the end of the derivation, the two copies of α in (17b) must be in a c-command relationship in order for them to be interpreted as a chain when Form Chain applies. If this does not occur, then Chain Reduction, which operates only on chains, will not be able to delete the appropriate copies for PF and possibly LF interpretation. This would presumably lead to a crash at the interfaces.

Adopting Nunes' view of movement, I propose the following is the correct derivation for relative clauses in English.[13] In (18a) a clause has been constructed and a copy of the complement NP has been made. In (18b) the NP copy is merged to the top of the derivation in Spec-CP, presumably to check a Q feature of C. In (18c) a copy of this NP is made in order to merge with a determiner head D as a separate syntactic object, yielding the two objects in (18d). Finally, (18e)

[12] Last Resort and the Minimal Link Condition are also conditions on chains in Nunes' system.

[13] Nunes (2004) briefly notes that his sideward movement approach is compatible with a raising analysis of relative clauses; however, he does not discuss the implications of this approach for the matching/raising debate or reconstruction effects.

represents the end of the derivation. Here the two objects have been merged together (via adjunction of the relative CP to NP) and Form Chain has applied.[14]

(18) a. $[_{TP}$ John $[_{VP}$ read $[_{NP}$ book]]] $[_{NP}$ book]

Copy

b. $[_{CP}$ $[_{NP}$ book] that $[_{TP}$ John $[_{VP}$ read $[_{NP}$ book]]]]

c. $[_{CP}$ $[_{NP}$ book] that $[_{TP}$ John $[_{VP}$ read $[_{NP}$ book]]]] $[_{NP}$ book] $[_{DP}$ the…]

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d. $[_{CP}$ $[_{NP}$ book] that $[_{TP}$ John $[_{VP}$ read $[_{NP}$ book]]]]

$[_{DP}$ the $[_{NP}$ book]

e. $[_{DP}$ the $[[_{NP}$ book] $[_{CP}$ $[_{NP}$ book] that $[_{TP}$ John $[_{VP}$ read $[_{NP}$ book]]]]]

Relative Clause Chain

Note that the derivational nature of clause formation along with the representational nature of chains assumed in (18) resolves the *raising paradox* noted in (16). Since the head of the relative and the relative CP are distinct constituents in (18d), there is no reason why the relative NP cannot be merged cyclically as an argument while the relative CP is late merged in the derivation as an adjunct.[15] As long as the copies of the relative head in the external DP and in the relative CP are in a c-command relation at the end of the derivation, Form Chain can apply to them, resulting

[14] An anonymous reviewer asks how the present account extends to a raising analysis of relative clauses employing the relative pronoun strategy along the lines of those proposed in Bianchi (1999), De Vries (2002) and others. Following Kayne (1994), these authors take relative pronouns to head a complex DP structure which undergoes movement to Spec,CP. Under Bianchi's account, the NP excorporates from the DP, moving to Spec,CP where it is selected by the external determiner. A similar account is available in the present analysis involving sideward movement. Once the complex DP has moved to Spec,CP, the NP complement of the DP undergoes sideward movement to become the complement of the external determiner (as in (18c–d)). The relative clause CP then adjoins to the external copy of the NP which then c-commands into it (as in (18e)). Form Chain results in chains formed between the raised and lower copies of the DP as well as between the DP-internal NP and its external copy. If lower copies of each chain are unpronounced, the correct result obtains.

(i) $[_{DP}$ the $[_{NP}$ book$]_j]$ $[_{CP}$ $[_{DP}$ which $[_{NP}$ book$]_j]_k$ $[_{TP}$ John $[_{VP}$ read $[_{DP}$ which $[_{NP}$ book$]_k$

The same reviewer points out that even that-type relatives can be derived as in (i) if, following Bianchi (1999) and De Vries (2002), we take the relativized phrase to be a DP with a null or defective D head, thus meeting Borsley's (1997) objections that the gap in a relative clause is an argument position that requires a DP rather than a bare NP. I will stick to assuming it is a bare NP for simplicity's sake, just noting that the current approach has no problem adopting the Bianchi/De Vries view of things.

[15] Indeed, as a reviewer pointed out to me, when CP is adjoined to NP after NP has combined with a determiner (illustrated in (18e)), this itself is an instance of acyclical late merger.

in a legitimate relative clause chain.[16] Together with Chain Reduction, this ensures that only one copy of the relative head is pronounced and that reconstruction is available.

The derivation in (18) also removes one of the difficulties with Kayne's (1994) raising structure. Recall that in Kayne's structure an external D head selects a CP as its complement. The relative head moves to its surface position in Spec-CP:

(19) $[_{DP}$ the $[_{CP}$ $[_{NP}$ headway] that $[_{TP}$ John $[_{VP}$ made $[_{NP}$ headway]]]]]

Since its proposal, the chief problem with (19) has been that there is no obvious way to license the external determiner. Presumably it cannot be licensed solely by its complement since in general determiners do not select CPs.[17] If it is licensed by the relative NP, it is not obvious how. Bianchi (2000) suggests that the relative NP is really a DP with a defective head. This head incorporates into the external determiner in order to license it. However, this analysis is rather ad hoc and requires a head to excorporate from a moved constituent, an otherwise poorly motivated operation. The derivation in (18), however, has no problem in licensing the external determiner since it directly selects the relative NP itself.

Finally, (18) offers a more natural view of reconstruction than previous analyses. Recall from section 2 that the raising analysis was originally motivated by the need for the head NP of a relative clause to be interpreted in the internal base position. In order for it to be interpreted there, a copy of the relative head must be present in the base position. The matching analysis, on the other hand, was not motivated by the need to interpret the relative head in a particular position, but rather by the need *not* to interpret it in a certain position (the base position). A copy of the relative head could not be present in the base position since this would trigger a Condition C effect if the head contained an R-expression. In section 3, however, we eliminated this argument by adopting vehicle change as a property of A-bar movement. In the present analysis, therefore, reconstruction is only obligatory when the interpretation of a particular clause requires it. Otherwise, the grammar may freely interpret copies in the relative clause chain. The traditionally termed ''raising'' relatives such as those involving idioms, Condition A, and variable binding require the head NP of the relative clause to be interpreted in its base position. Relatives without such requirements, however, are free to have their head NP interpreted in any position occupied by a copy of the head. Reconstruction is thus entirely optional in all kinds of English relative clauses. Interpretation is only forced in one position or another by independent requirements.

To summarize, in this section I have offered a new analysis for English relative clauses based on Nunes' notion of sideward movement. Together with the assumptions from previous sections, this analysis is capable of deriving both traditionally termed ''matching'' and ''raising'' relatives as well as resolving the theory-internal problems noted above. I further showed that this analysis offers a more natural phrase structure for raising relatives as well as a more natural view of reconstruction. The latter point will be crucial in explaining an empirical difference between

[16] As Jairo Nunes (personal communication) has pointed out to me, it is often assumed that adjuncts asymmetrically c-command the target of adjunction. In order for my analysis in (18e) to work, however, this assumption must be given up, at least for relative clauses, since the relativized NP must be able to c-command into the relative clause adjoined to it.

[17] At least in English. A reviewer points out that in some languages determiners do appear to select CPs in some contexts and that the nominalization of clauses is quite common cross-linguistically.

matching and raising relatives observed by Hulsey and Sauerland (2002). I address this in the next section.

6. Extraposition and late merger

An argument for the late merger of adjuncts independent of the Frieden–Lebeaux facts is presented in Fox and Nissenbaum (1999, henceforth F&N). F&N begin by observing that both complements and adjuncts seem equally able to undergo extraposition over an adverbial:

(20) a. We saw [a painting t_i] yesterday [of John]$_i$.
b. We saw [a painting t_i] yesterday [from the museum]$_i$.

If extraposition involves rightward movement, this state of affairs is surprising since it is a well-known fact about movement that while complements can be extracted from NPs, adjuncts cannot:

(21) a. Who did you see [a painting of t]?
b. *From where did you see [a painting t]?

Without going into the details of their analysis, F&N demonstrate that in fact extraposition obeys this restriction on movement. They show that while extraposed complements pass tests indicating they have undergone movement (such as definiteness, across-the-board extraction, and parasitic gap licensing), extraposed adjuncts do not.

The analysis F&N propose for extraposed adjuncts are as follows: first, the argument of the main clause undergoes rightward QR past the position of the adverbial. Then the adjunct is merged to the covert copy of the DP in its raised position.

(22) We saw [a painting] yesterday] <a painting> [from the museum]

F&N provide evidence that the argument DP has undergone QR in (22), showing that the DP takes scope in a position higher than its base position. For instance, ''free choice *any*,'' which must be interpreted within the scope of a particular verb such as *look for*, cannot appear in contexts where its modifier has been extraposed as in (23a). It can appear in contexts, however, where its complement has been extraposed as in (23b).

(23) a. *I looked for any clue very desperately [that the detective might have overlooked]
b. I looked for any clue very desperately [that the detective might have overlooked important evidence]

(23a) shows that the argument DP has undergone QR out of the scope of *looked for* whereas in (23b) it has not. All of this is evidence that adjuncts, including relative clauses, are late merged at the end of a derivation. This conclusion is completely compatible with the present analysis of relatives outlined in the previous sections.

A complication arises, however, when we consider an asymmetry noted by Hulsey and Sauerland (2002, henceforth H&S). Building on Fox and Nissenbaum's analysis of extraposition,

H&S show that there is an additional asymmetry within the extraposition of relative clauses. Specifically, relative clauses that have a matching analysis can undergo extraposition while relatives with a raising analysis cannot.

(24) a. *Mary saw [the heed] last year [that John paid __]
b. Mary saw [the picture of $John_i$] yesterday [that he_i likes __]

Accepting Fox and Nissenbaum's analysis, H&S argue that the asymmetry in (24) arises due to the different structures required for matching and raising relatives. Since matching relatives involve an adjunction structure, there is no reason why the adjoined CP cannot be merged later in the derivation than the external head NP. With regard to raising relatives, however, H&S argue that late merger is not possible since these relatives involve a complementation structure (ala Kayne, 1994). In that case, the relative head is not external and cannot form a constituent that is distinct from the relative CP. Therefore, the latter cannot be late merged, but must be merged cyclically. This explanation is a problem for the present analysis since I have argued that both matching and raising relatives are derived via adjunction structures and in fact have identical analyses. Under my analysis there is nothing about the derivational structures of either matching or raising relatives that could give rise to the asymmetry in (24).

Despite its initial appeal, however, H&S's explanation for the extraposition facts makes an additional prediction that they do not discuss. If the asymmetry in (24) is really an asymmetry with regard to the possibility of late merger, as H&S claim, then they also predict an asymmetry between matching and raising relatives in wh-questions: raising relative clauses should at least sometimes exhibit Condition C effects while matching relatives should never exhibit such effects. This prediction is not born out, however. Both matching and raising relatives are equally acceptable as adjuncts to wh-phrases containing an R-expression:

(25) a. What headway that $John_i$ made did he_i later regret?
b. Which picture of himself that $John_i$ gave to $Mary_k$ did she_k take home?
c. Which picture of $John_i$ that he_i gave to $Mary_k$ did she_k cherish?

The examples in (25a–b) demonstrate that Condition C effects do not arise when raising relatives modify wh-phrases. (25c) reiterates the point that matching relatives also obviate such effects. This is unexpected under the view that raising relative clauses are complements to their heads while matching relatives are adjuncts. If this were the case, we would expect that at least some raising relative clauses would display Condition C effects just as some wh-word complements do (when vehicle change fails to apply). As far as I can tell, no raising relatives modifying wh-NPs display such effect.

However, the situation in (25) is expected under the uniform analysis I provided above: since all relative clauses are late-merged as adjuncts, R-expressions contained in relatives should never trigger Condition C effects in wh-movement environments. If this is true, however, then Hulsey and Sauerland's facts require an alternative account that does not depend upon raising and matching relatives differing with regard to late merger.

Such an account is possible if we consider that the asymmetry in (24) may arise from interpretative rather than structural considerations. Taking this approach, I propose that an NP with special interpretative licensing requirements must be licensed within each chain it is a

member of. Consider the LF structure of (24a), for example. Here the NP *heed* must be licensed as the complement to the verb *pay* if it is to be licensed as part of an idiom. While this condition is met with regard to the relative clause chain, it is not met with regard to the QR chain since no member of that chain is a complement to the verb *pay*.

(26) *Mary saw [$_{DP}$ the heed] last year [$_{DP}$ the [[$_{NP}$ heed][[$_{NP}$ heed] that John **paid** [$_{NP}$ heed]]].

QR Chain RC Chain

If this licensing failure is behind the ungrammaticality of (26), then it should be possible to make the sentence grammatical by ensuring that *heed* is licensed in the QR chain as well as the RC chain. This can be accomplished by licensing *heed* in the matrix clause. Compare the examples in (27) where the relevant NP is licensed only in the relative clause-internal position with the data in (28) where the NP is licensed in both the matrix and relative clauses.

(27) a. *John saw the heed last year that Mary paid.
b. *Mary saw the picture of himself last year that John painted
c. *Mary saw the photo of his$_i$ mother last night that every student$_i$ brought.

(28) a. John paid the same heed last year that Mary paid.
b. John$_i$ saw the picture of himself$_i$ last year that he$_i$ painted
c. Every student$_i$ saw the photo of his$_i$ mother last night that he$_i$ brought

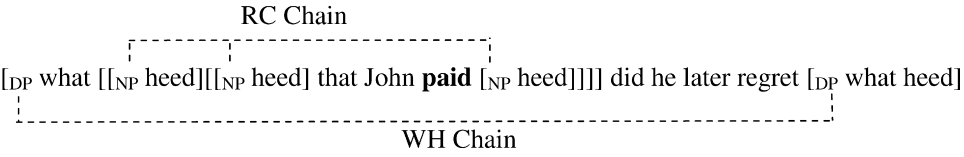
The data in (27–28) force us to the conclusion that the ungrammaticality of the sentences in (27) stems from a failure to license the NP in the QR chain. This explains why traditional raising relatives cannot be extraposed: the NP heads of such relatives have special licensing requirements that, in the examples in (27), are not met. It also explains why traditional matching relatives can always be extraposed: the head NPs in these relatives have no special licensing requirements. Therefore, they are always licensed in both the QR and RC chains.

Unfortunately, while this conclusion solves the puzzle raised by H&S in a manner consistent with the present view of the syntax of relative clauses, it raises another serious difficulty, noted also in Chomsky (2000) and Fox (1998). Recall the observation in (25) that all relatives, whether matching or raising, are equally grammatical as modifiers of wh-DPs, never triggering Condition C effects. I repeat the data here:

(29) a. What heed that John$_i$ paid did he$_i$ later regret t?
b. Which picture of himself that John$_i$ gave to Mary$_k$ did she$_k$ take home?
c. Which picture of John$_i$ that he$_i$ gave to Mary$_k$ did she$_k$ cherish?

Given that we have ruled out the sentences in (27) by appealing to the idea that the relevant NPs are not licensed in the QR chain, the question arises how the same kinds of NPs are licensed in the wh-DP chains in (29). To see the problem more clearly, consider the LF structure for (29a) given in (30). While the NP *head* is licensed in the RC chain as a complement of the verb *paid*, it is not licensed in the WH chain. Thus, we have precisely the same kind of licensing failure that I just claimed is behind the ungrammaticality of the extraposed raising relatives in (27). By that logic, (30) should be uninterpretable, though it is not.

(30)



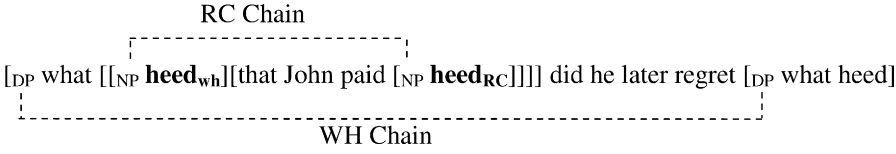
The LF structures in (30) and (26) present somewhat of a paradox with only one way out: whatever the mechanism for licensing the idiom complement NP in the wh-DP chain in (30), it must be unavailable for the QRed DP chain in (26). I propose that this mechanism is related to the (un)obligatory nature of reconstruction in wh-movement and QR. I demonstrate this difference below.

It is well-known that reconstruction of the restriction of wh-DPs is optional. In (31), for example, the anaphor *himself* contained in the NP restriction has an ambiguous reference. The standard account is to assume that this ambiguity arises from optional reconstruction: the NP can be interpreted either in its raised position as in (31b) or in its reconstructed position as in (31c).

(31) a. John_i wonders which picture of $\text{himself}_{i/j}$ Bill_j likes best.
b. John_i wonders which <picture of $\text{himself}_{i/*j}$> Bill_j likes best <~~picture of himself~~>
c. John_i wonders which <~~picture of himself~~> Bill_j likes best <picture of $\text{himself}_{*i/j}$>

Now, reconsider the LF structure of a wh-question with a raising relative given in (30), repeated in (32), omitting irrelevant copies. I propose that *heed* is licensed in this chain as long as the copy of *heed* that is also a member of the RC chain is the one that is interpreted within the wh-DP chain. Note that this is not to say that it is this topmost copy of *heed* that is interpreted in the RC chain. This cannot be the case since in that chain it must be the lowest copy of *heed* in its base-position that is interpreted in order to license the NP as part of an idiom. Rather, it is only with regard to the DP chain that the topmost copy of *heed* is interpreted. My claim is that *heed* is licensed for interpretability in this position due to the fact that this copy is also a member of the RC chain in which *heed* is licensed as a complement to *paid*. In (33) the interpreted copies are in bold and sub-scripted according to which chain interprets them.

(32)



Now that we have a mechanism for licensing the idiom NP complement in the wh-chain in (32), the question is why this mechanism is not available in QR DP chains. Note that the solution in (32) relies on the fact that the restriction NP of the wh-DP can be interpreted in its raised position. Since relative clauses are late-merged, the copy of the NP that is both a part of the RC chain and the wh-DP chain will always be the topmost copy in the wh-DP chain. Thus the mechanism in (32) would not be possible if reconstruction were obligatory with wh-movement. I propose that this is precisely why the mechanism in (32) is not possible in QRed DP chains. While reconstruction of the restriction is optional in overt wh-movement, it is obligatory in QR

chains. To demonstrate this, consider (33). Here the sentence has two readings, (33a) which says that the existential *someone* has scope over the universal quantifier *every* and (33b) which says that *every* has scope over *someone*. Under that reading, all of John's pictures were given to Mary by someone, but not all necessarily by the same person.

(33) a. Someone gave Mary every picture of John (in Bill's album).
b. [someone][every picture of John] gave Mary
c. [every picture of John] [someone] gave Mary

Now consider (34) in which *Mary* has been replaced with a pronoun coreferential with *John*. If it were the case the NP restriction of a QRed DP could be interpreted in its raised position, QR should rescue (34) from a Condition C violation, at least on the wide-scope reading of *every*. This is not the case, however; a Condition C violation occurs regardless of the effects of QR:

(34) a. *Someone gave him$_i$ every picture of John$_i$ (in Mary's album)
b. *[someone][every picture of John$_i$] [<someone> gave him$_i$ <every picture of John$_i$>]
c. *[every picture of John$_i$][someone] [<someone> gave him$_i$ <every picture of John$_i$>]

The fact that the NP restriction of a QR chain must reconstruct means that it is impossible for this NP to be interpreted in its raised position. In the cases of relative clause extraposition at hand, this means that QR will never been able to interpret the copy of the NP restriction that is also a member of RC chain. Thus an idiom NP complement that is part of a QRed DP chain will never be licensed unless it begins in its base-position as a complement of the licensing verb (as in (28a)). (31) and (34) thus explain why it is the case that raising relatives can be licensed as adjuncts to wh-moved DPs, but not to QRed DPs.[18,19]

To restate H&S's generalization, it is not 'raising' relatives which cannot undergo extraposition, but rather relatives which require reconstruction and whose heads are not independently licensed in the matrix clause. I have shown that this is not due to derivational considerations, but rather to the interpretative requirements of the chains involved in such structures.

7. Late merge: NP versus VP adjuncts

I now turn briefly to a final issue raised by the present analysis. In his book and in two other papers (Nunes and Uriagereka, 2000; Hornstein and Nunes, 2002), Nunes expressly disallows the

[18] A question arises as to why none of the links of the relative clause chain are pronounced. However, this seems to be an independent question arising from the possibility of performing a covert operation (QR) before an overt operation (late merger). Nunes (2004) suggests that sideward movement may be involved in covert operations if they are viewed as a process of copying and merging features. If we assume that QR involves only feature movement, however, it is unclear to me how an adjunct could adjoin to and modify such features. I leave this problem open.

[19] Why these two operations should exhibit this difference is not entirely clear. Karlos Arregi (personal communication) has suggested that the distinction may really be about the difference between overt and covert movement. This must be the case if one assumes that in situ wh-DPs raise covertly, since like QR, covert wh-movement cannot bleed Condition C effects. Another possible basis for the difference, suggested to me by Elabbas Benmamoun, is the fact that wh-movement is a ''triggered'' movement, motivated by the need to satisfy some uninterpretable feature, whereas QR is ''untriggered'' movement. I leave the matter up for debate.

late merger of adjuncts. As he points out, if adjuncts are allowed to be uniformly late-merged, then there is nothing that restricts movement out of adjuncts from always being available. Thus in (35) the wh-phrase could be copied from (35a) and merged to (35b) once the Q feature of C has been introduced but before the adjunct in (35a) is merged to the main derivation, ultimately yielding the ungrammatical structure in (35).

(35) a. [after filing [which paper]$_i$]
b. [C+Q John did read the book]

(36) *[[which paper] did John read the book [after filing [which paper]]

Nunes prevents such derivations by requiring that adjuncts be merged cyclically. Thus in (36) *after filing which paper* must be merged at the vP level, before the Q feature requiring the movement of *which paper* to Spec,CP is introduced. By the time that feature is merged to the derivation, the wh-phrase has been fossilized within the adjunct and cannot be extracted without incurring an island violation.[20]

Clearly Nunes' claims about the cyclic merger of adjuncts are at odds with my claim in this paper that adjuncts are uniformly late merged. However, the conflict does not seem irreconcilable. Looking closer at the details, the particular adjuncts my analysis requires to be late-merged are all nominal adjuncts, namely relative clauses and prepositional adjuncts like those examined in Fox and Nissenbaum (1999). The adjuncts that Nunes needs to rule out in his system, however, are verbal adjuncts, phrases that adjoin to vP. The conclusion seems clear: while nominal adjuncts may be late merged, verbal adjuncts must be merged cyclically.

It is an interesting question why this dichotomy should exist. A possible explanation may stem from the site of adjunction in each case. Verbal adjuncts must be adjoined to a position in the middle of the clause structure (vP); as such, verbal adjunction is an intermediate step in the derivation of a full clause. On the other hand, nominal adjuncts are presumably not adjoined to some lower projection within DP, but are merged to the DP itself. Therefore, nominal adjunction may be the final step in the derivation of a DP. This allows nominal adjuncts to be merged anytime after the construction of a DP, giving them the appearance of late merger.[21] This conclusion is preliminary, however, and I leave further exploration of this division for further work.

8. Conclusions

In this paper, I have reviewed the case for the matching and raising distinction in English relative clauses, concluding that an independent matching analysis is unnecessary to account for the facts. Taking Safir's (1999) conclusion that vehicle change is a general property of A-bar movement and Nunes' (2004) understanding of the copy + merge theory of movement, I demonstrated that my analysis has several advantages over previous accounts. First, this analysis does not require stipulations such as an LF matching operation or odd selectional requirements for functional heads. Second, the present account allows the decision of what copy in a relative clause

[20] See Nunes and Uriagereka (2000) for reasons (based on the logic of Uriagereka, 1999) why this fossilization takes place.

[21] Nunes and Uriagereka (2000) guarantee this by adopting Chomsky's (1998) notion of phases. Indeed, they show that something like a phase system is required to rule out certain cyclic but ungrammatical parasitic gap derivations. If that is the case, then we need not assume that nominal adjuncts are adjoined to the highest level of DP structure, but only that they are part of the final subarray of the numeration accessed by the computation in DP derivations.

chain gets interpreted to be truly optional, influenced only by independent interpretative requirements. This leads to a better understanding of the behavior of relatives in extraposition contexts. Finally, my analysis resolves the hitherto undiscussed *raising paradox* in which an NP that originates within an adjunct is merged earlier in the derivation than the adjunct itself. Under my account, relative heads are external to the relative CP, allowing for late merger, yet they remain transformationally related to relative clause internal positions, allowing for reconstruction.

Acknowledgements

I would like to thank Karlos Arregi, Abbas Benmamoun, Cedric Boeckx, Jairo Nunes, James Yoon, two anonymous *Lingua* reviewers and the participants of the 2004 meeting of the Michigan Linguistics Society for their helpful comments and questions on this paper and its previous forms.

References

Aoun, J., Nunes, J., 2002. Vehicle change effects: an argument for move F. Ms., University of Southern California/ Universidade Estadual de Campinas.

Bhatt, Rajesh, 2002. The raising analysis of relative clauses: evidence from adjectival modification. Natural Language Semantics 10, 43–90.

Bianchi, V., 1999. Consequences of Antisymmetry: Headed Relative Clauses. Mouton de Gruyter, Berlin.

Bianchi, V., 2000. The raising analysis of relative clauses: a reply to Borsley. Linguistic Inquiry 31, 123–140.

Borsley, R. 1997. Relative Clauses and the Theory of Phrase Structure.

Brame, M., 1968. A new analysis of the relative clause: evidence for an interpretive theory. Unpublished Ms., Massachusetts Institute of Technology, Cambridge, MA.

Carlson, G., 1977. Amount relatives. Language 58, 520–542.

Chomsky, N., 2000. Minimalist inquiries: the framework. In: Martin, R., Michaels, D., Uriagereka, J. (Eds.), Step by step: Studies in Honor of Howard Lasnik. MIT Press, Cambridge, Mass, pp. 89–155.

Chomsky, N., 1998. Minimalist inquiries: the framework. MIT Occassional Papers in Linguistics 15. MITWPL, Cambridge, MA.

De Vries, M., 2002. The syntax of relativization. Doctoral dissertation, Netherlands Graduate School of Linguistics.

Fiengo, R., May, R., 1994. Indices and Identity. MIT Press, Cambridge, MA.

Freidin, R., 1986. Fundamental issues in the theory of binding. In: Lust, B. (Ed.), Studies in the Acquisition of Anaphora. Reidel, Dordrecht, pp. 151–188.

Fox, D., 1998. Economy and semantic interpretation. Doctoral dissertation, MIT, Cambridge, MA.

Fox, D., Nissenbaum, J., 1999. Extraposition and scope: a case for overt QR. In: Bird, S., Carnie, A., Haugen, J.D., Norquest, P. (Eds.), WCCFL 18. Cascadilla Press, Somerville, MA, pp. 132–144.

Fults, S., 2004. Matching and raising compared. Ms., University of Maryland, College Park.

Heycock, C., 1993. (Anti-)Reconstruction and referentiality. In: The Proceedings of WCCFL 12. pp. 267–281.

Higgenbotham, J., 1983. Logical form, binding, and nominals. Linguistic Inquiry 14, 395–420.

Hornstein, N., Nunes, J., 2002. On asymmetries between parasitic gap and across-the-board constructions. Syntax 5 (1), 26–54.

Hulsey, S., Sauerland, U., 2002. Sorting out English relative clauses: a reply to Bhatt. Ms., University of Tubingen/ University of Massachusetts.

Kayne, R., 1994. The Antisymmetry of Syntax. MIT Press, Cambridge, MA.

Kuno, S., 1997. Binding theory and the Minimalist Program. Ms., Harvard University, Cambridge, MA.

Lebeaux, D., 1988. Language acquisition and the form of grammar. Ph.D. dissertation, University of Massachusetts, Amherst.

Lebeaux, D., 1990. Relative clauses, licensing, and the nature of derivation. In: Proceedings of NELS 20. GLSA, University of Massachusetts, Amherst, pp. 318–332.

Nunes, J., Uriagereka, J., 2000. Cyclicity and extraction domains. Syntax 3 (1), 30–43.

Nunes, J., 2004. Linearization of Chains and Sideward Movement. MIT Press, Cambridge, MA.

Postal, P., 1997. Strong crossover violations and binding principles. Paper presented at ESCOL '97, Yale University.

Reinhart, T., Reuland, E., 1991. Anaphors and logophors: an argument structure perspective. In: Koster, J., Reuland, E. (Eds.), Long-Distance Anaphora. Cambridge University Press, Cambridge, pp. 283–321.

Safir, K., 1999. Vehicle change and reconstruction in A-bar chains. Linguistic Inquiry 30, 587–620.

Sauerland, U., 1998. The meaning of chains. Ph.D. dissertation, Massachusetts Institute of Technology, Cambridge, MA.

Sauerland, U., 2000. Two structures for English restrictive relative clauses. In: Saito, M., et al. (Eds.), Proceedings of the Nanzan GLOW. Nanzan University, Nagoya, Japan, pp. 351–366.

Uriagereka, J. 1999. Multiple Spell-out. In: Epstein, S., Hornstein, N. (Eds.), Working minimalism. MIT Press, Cambridge, Mass, pp. 251–282.

Vergnaud, J.-R., 1974. French relative clauses. Doctoral dissertation, MIT, Cambridge, MA.