

# Relabeling Heads: A Unified Account for Relativization Structures

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A tenet of any version of phrase structure theory is that a lexical item can transmit its label when merged with another category. We assume that if it is internally merged, a lexical item can turn a clause into a nominal phrase. If the relabeling lexical item is a *wh*-word, a free relative results; if it is an N, a full relative results; if it is a non-*wh* D, a pseudorelative results. It follows that the head of a relative construction cannot be more complex than a lexical item. We show massive evidence that when it is otherwise (e.g., *the book about Obama that you bought*), the modifier is late-merged after the noun has moved and relabeled the structure.

*Keywords:* relative clauses, labeling, head movement, noun complementation, free relatives, pseudorelatives

## 1 Introduction

In this article, we show how a specific approach to phrase structure theory can shed light on the syntax of different types of relativization structures (free relatives, externally headed relative clauses, and pseudorelatives).

Although relative constructions have been systematically investigated for 40 years in the generative tradition, the debate over their correct analysis is still very much open. In particular, one aspect that remains controversial is the best way to capture the fact that the relative clause “head” seems to play a double role in the overall structure. For example, the “head” (*the*) *boy* in (1) and (2) is a constituent of the matrix clause, but at the same time it seems to satisfy the selectional requirements of the predicate internal to the relative clause.

This article is the second publication resulting from the research project on labeling and its consequences for the theory of grammar that the two authors have been pursuing since 2007 (the first publication is Cecchetto and Donati 2010). Though the order of the authors’ names differs in the two articles, the authors contributed equally to both.

We presented the ideas discussed here at GLOW Asia VIII (Beijing, 2010); at the XX Colloquium on Generative Grammar (Barcelona, 2010); at the Workshop on Minimalist Approaches to Syntactic Locality (Budapest, 2009); at the XVIII Colloquium on Generative Grammar (Lisbon, 2008); at the 38th Meeting of the North East Linguistic Society (Ottawa, 2007); and at research seminars at Harvard University and at the University of Siena. We thank the audiences at these events for their comments. Special thanks to Adriana Belletti, Chiara Branchini, Gennaro Chierchia, Luigi Rizzi, Adam Szczegielniak, Sandro Zucchi, and three anonymous *LJ* reviewers for specific comments that led us to sharpen our ideas. What still does not work is our fault.

- (1) The boy that I will never forget has arrived.
- (2) The boy who I will never forget has arrived.

At least three main devices have been proposed in the generative tradition (see Bianchi 2002 for a historical survey). According to the *raising* approach (see, e.g., Vergnaud 1974, Kayne 1994, Bianchi 1999, Bhatt 2002), the “head” is inserted directly in the relativization site and moves to a position external to the relative clause. Under a second approach, sometimes called the *head-external* approach, the relative clause “head” is not transformationally related to the gap inside the relative clause. Instead, a relative pronoun (which is overt in (2) but remains phonologically null in (1)) moves to Spec,C by leaving a trace in the gap position and is identified with the relative clause “head” (see Chomsky 1981 and Browning 1987 for two classical variants of this approach). A third (less pursued) approach, the *matching* analysis, like the raising analysis, postulates that there is an internal head that is phonologically deleted under (near) identity with the external head. However, according to the matching analysis, the internal head and the external head are *not* part of a movement chain, but are related by whatever mechanism links an elided constituent and its antecedent in ellipsis cases (Chomsky 1965, Kayne 1975, Cinque 1978, Sauerland 2003; and see Hulsey and Sauerland 2009 for a recent revival).

In section 2, we briefly summarize the version of bare phrase structure theory developed in Cecchetto and Donati 2010, which is the framework in which the analysis of relative constructions is set. One crucial feature of this theory is that a lexical item can transmit its label when it is merged with another category, both when this is a case of first Merge (this derives the result that the head projects when it is merged with a complement/modifier) and when the lexical item is internally merged (moves). Thus, a lexical item has the power to relabel the structure with which it merges. This relabeling option directly explains the properties of free relatives, as we argue in Cecchetto and Donati 2010 and as we thoroughly discuss in section 3. In section 4, we review the main arguments supporting the raising analysis of (full) relative clauses, and in section 5, we examine three main objections that have been raised against it. In section 6, we propose our approach to externally headed relative clauses. This is a modified version of the raising analysis, which assumes that only the head noun raises and, being a lexical item, relabels the structure. We show how our approach is immune to the criticisms that affect the traditional version of the raising analysis. In section 7, we discuss the cases in which the “head” of the relative clause appears to be phrasal, and we claim that any modifier of the relative clause head is late-merged after the head has raised. One important consequence of our approach is that the distinction between complement and adjunct in the nominal domain is considerably weakened. We defend this claim in detail and show that the pattern of reconstruction effects in relative clause constructions supports it.

In section 8, we discuss what triggers the movement of the relative clause head, arguing that selection (by an externally merged determiner) can act directly as the trigger of some instances of head movement. Assuming that movement in relative clauses is directly triggered by the determiner head selecting the clause implies divorcing it from the Comp area. In section 9, we examine a positive consequence of this selection-driven approach to relativization: Romance

pseudorelatives are analyzed as the non-*wh* counterpart of free relatives, involving the movement of a D head (a proper name or a pronoun) to the root of the clause and a systematic relabeling option. The restriction of this class of relatives to subject relatives is explained in terms of an intervention effect. We close the section by discussing the locality properties of the various types of relativization structures examined in the article. In section 10, we provide some general conclusions.

## 2 The Framework: The Cecchetto and Donati 2010 Theory of Labeling

When two syntactic objects are merged, typically only one of them provides the label for the newly formed object.<sup>1</sup> The label can be selected by an external object (e.g., when V and the internal argument are merged, the resulting object with label V is selected by *v*) and can trigger further computation (e.g., when T and *v*P are merged, the resulting object with label T probes the external argument DP, which can be attracted to the canonical subject position). Assuming the Inclusiveness Condition, according to which narrow syntax merely operates on lexical items and cannot “add” interpretive material (Chomsky 1995), a label cannot be a new object distinct from the items that are merged, such as a label in standard X-bar theory. Rather, a label is bound to be a subset of the features of the items that are merged. In Cecchetto and Donati (C&D) 2010, elaborating on Chomsky 2008, we propose that, if the notion of probe includes selection, a single labeling algorithm, reported in (3), can derive the core cases covered by the rich apparatus of X-bar theory.

### (3) *Probing Algorithm*

The label of a syntactic object  $\{\alpha, \beta\}$  is the feature(s) that act(s) as a probe of the merging operation creating  $\{\alpha, \beta\}$ .  
(C&D 2010:245)

(3) is intended to apply to cases of both internal Merge (= movement) and external (first) Merge. To see how (3) works, consider the following simple case:

### (4) The boy ate the cake.

- a. The label of  $\{\text{ate}, \{\text{the}, \text{cake}\}\}$  is the categorial feature of V.  
(The transitive verb selects for a direct object.)
- b. The label of  $\{v, \{\text{ate}, \{\text{the}, \text{cake}\}\}\}$  is the categorial feature of *v*.  
(*v* selects for the VP.)

<sup>1</sup> Collins (2002) sketches a theory of syntax in which labels can be dispensed with. However, his ultimate target is the notion of label as an object distinct from the two items that are merged, as in Chomsky’s (1995) version of bare phrase structure theory. Once a label is defined as a subset of the features of one of the two merging objects, the simplification argued for by Collins can be achieved. In fact, the minimal notion of label assumed here is close (although not identical) to Collins’s notion of Locus. See Cecchetto and Donati 2010 for further discussion.

- c. The label of  $\{\{\text{the, boy}\}, \{v, \{\text{ate, \{\text{the, cake}\}\}\}\}\}$  is the categorial feature of  $v$ .  
(When the external argument is merged in  $\text{Spec},v$ , the feature that triggers this operation is the categorial feature  $v$ , which requires that the external argument be merged.)
- d. The label of  $\{T, \{\{\text{the, boy}\}, \{v, \{\text{ate, \{\text{the, cake}\}\}\}\}\}\}$  is the categorial feature of  $T$ .  
( $T$  selects for  $vP$ .)
- e. The label of  $\{\{\text{the, boy}\}, \{T, \{\{\text{the, boy}\}, \{v, \{\text{ate, \{\text{the, cake}\}\}\}\}\}\}\}$  is the categorial feature of  $T$ .  
(When the subject is internally merged in  $\text{Spec},T$ , the feature that triggers this operation is the categorial feature of  $T$ . The  $\phi$ -features of  $T$  can be checked in situ via *Agree*, so they do not, at least directly, trigger Merge of the external argument.)

In C&D 2010, we claim that the Probing Algorithm (3) applies in a larger set of cases since, following Chomsky (2008:139, 144), we assume that every lexical item is endowed with a feature, the edge feature, that forces the lexical item to merge with other material. We identify the edge feature of a word with its categorial feature, since words come in different varieties (this is what allows them to combine according to rules of composition). Given this assumption, any time a lexical item is merged, it qualifies as a probe by virtue of its edge feature. This means that a lexical item, being a probe by definition, always activates the Probing Algorithm (3), and its categorial feature can provide the label. For example, each time a head (= lexical item) is merged with its complement, the head is bound to project. This way, the system based on (3) captures the two empirical generalizations that any version of phrase structure theory must account for: namely, that the target of movement typically projects and that a lexical item (a head) projects when it is merged with a complement XP. Here, we do not address other special labeling cases discussed in C&D 2010 (including labeling in adjunction configurations and the symmetric configurations where two lexical items or two complex syntactic objects are merged), since this cursory summary suffices as a background for our approach to relative clauses. However, before we turn to full (ordinary) relatives, it is useful to look at another case of relativization: free relatives.<sup>2</sup>

### 3 Labeling Conflicts: Free Relatives

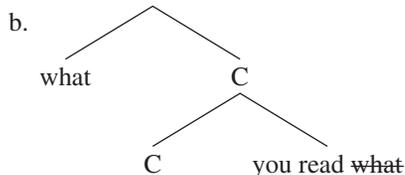
An interesting consequence of the system based on the Probing Algorithm (3) is that since the probe provides the label, a labeling conflict can arise if more than one probe triggers the relevant merging operation. In C&D 2010, we discuss two such cases in detail. One case is Condition C configurations, which are reduced to cases of mislabeling, so that Condition C as a primitive can

<sup>2</sup> Although this is not the place for detailing our stand on the status of the lexicon in the architecture of grammar, it should be clear that our proposal assigns a central role to words (i.e., categorized and inflected lexical items) in the syntactic computation and is therefore remote in spirit from any late-insertion approach to lexicalization, such as Distributed Morphology.

be dispensed with. The other case, which concerns us more directly here, is a labeling conflict that arises in so-called free relatives.

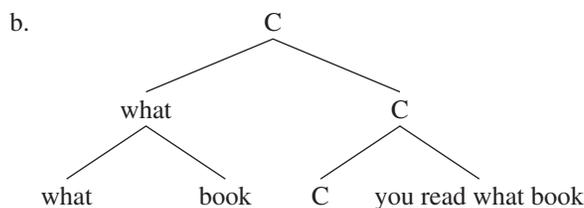
Consider the structure in (5b).

(5) a. what you read



(5) is derived by internally merging a single lexical item *what* to the edge of a clause. The result is a conflict between two probes: *what*, being a lexical item, is by definition a probe (because of its edge feature) and should provide the label. On the other hand, C, being the probe of the merging operation, should also provide the label.<sup>3</sup> This kind of conflict never arises when a phrase is internally merged, as in (6).

(6) a. what book you read



Here, Merge holds between two syntactic objects, and no conflict arises: by the Probing Algorithm (3), C, the probe of the merging operation, labels the entire construction.

The prediction is that the minimal difference between (5) and (6) should be reflected in the distribution and interpretation of the two structures: more precisely, (5) is predicted to have two possible labels, and (6) only one. This prediction is reflected by the systematic ambiguity of a phrase like *what you read*: it can be interpreted as a free relative and be embedded under a verb selecting a DP, as in (7), or it can be interpreted as an indirect interrogative clause and be embedded under a verb selecting for clausal complements, as in (8).

(7) I read what you read/a book.

(8) I wonder what you read/if the sun will shine tomorrow.

<sup>3</sup> A reviewer rightly observes that in our system, a labeling conflict also arises when *what* is externally merged with *read* in the VP. We discuss these “first Merge cases” in C&D 2010, where we propose that *read* provides the label, because it is a double probe (it is a lexical item *and* it selects for the object).

Notice that although we make free relatives a central case of our general theory of labeling in C&D 2010, the idea that free relatives are derived through the “projecting movement” of the *wh*-word is not new. In fact, it goes back to Larson 1987 (for further development, see Iatridou, Anagnostopoulou, and Izvorski 2001, Bury 2003, Donati 2006, Citko 2008). On the projecting property of head movement, see also Surányi 2005, 2007, 2008.

The same ambiguity can arise whenever a *wh*-word moves to the edge of the clause: *when*, *where*, *why*, and (in many languages, but surprisingly not in English) *who*, *how*. See Caponigro 2003 for a crosslinguistic survey. Crucially, no ambiguity—either in interpretation or in distribution—arises when phrasal movement is involved. As shown in (9), the structure resulting from phrasal movement can only occur in environments for clauses and can only be interpreted as a simple interrogative.<sup>4</sup>

- (9) a. I wonder what book you read.  
 b. \*I read what book you read.

As we note in C&D 2010, a possible objection can be raised against this approach: namely, there is a class of free relatives, illustrated in (10), that appear to allow phrasal *wh*-movement.

- (10) I shall visit whatever town you will visit.

We deal with this potential counterexample in the appendix. Suffice it to say here that there is strong evidence that *-ever*-relatives and their equivalents in other languages are not free relatives at all; rather, they display a structure corresponding to that of full relatives. And to full relatives we now move.

#### 4 Full Relatives: Advantages of the Raising Analysis

As we mentioned, the gist of the raising analysis is that the position of the gap inside the relative clause and the external ‘head’ are transformationally related. All variants of this analysis have one obvious advantage: since the existence of transformations is well attested in constructions distinct from relative clauses, the relation between the gap and the ‘head’ is explained with no need to introduce a special mechanism. In addition to this fundamental positive feature, the raising analysis has three other merits, as pointed out by its proponents.

First, it accounts for the pattern found with idiomatic expressions. The idiomatic object can be relativized if the idiomatic verb is internal to the relative clause, but not if it is external. This is illustrated in (11) for French.

- (11) a. Il décrit dans son livre [la part qu’il a prise *t* aux travaux  
 he describes in his book the part that he has taken at.the workings  
 du 9ème congrès].  
 of.the 9th conference  
 ‘He describes in his book the part that he had in the 9th conference.’

<sup>4</sup> A natural question arises in relation to (9): what blocks the derivation illustrated in (i)? In (i), the *wh*-D raises, stranding its nominal complement and nominalizing the structure.

(i) \*I read what you read [<sub>D</sub> what book].

This question is addressed in detail in C&D 2010. In a nutshell, the derivation in (i) implies a locality violation: the *wh*-D moves, crossing the label D of the syntactic object formed by the *wh*-D and its nominal complement, and the label D is closer to C than the *wh*-D. See also section 9 for a discussion of locality in relativization.

- b. \*Il a pris aux travaux du 9ème congrès [la part qu'il décrit  
 he has taken in.the workings of.the 9th conference the part that he describes  
 dans son livre].  
 in his book  
 (Vergnaud 1974:58–59)

The contrast in (11) indicates that at some level, the external “head,” (*la*) *part*, occupies the argument position inside the relative clause, under the assumption that idiomatic expressions like *prendre part* ‘take part’ must form a unit when they are inserted in the syntax from the lexicon.

Second, it accounts for the pattern of relativization of predicative DPs, which is impossible if the features of the matrix and those of the embedded subject do not match. (12) is ungrammatical because the predicative DP *les comédiens* ‘the comedians’ does not agree (in number) with the copula inside the relative clause, although it does agree with the main verb copula.

- (12) \*Ce ne sont pas les comédiens que leur père était.  
 it NEG are not the comedians that their father was  
 (Vergnaud 1974:63)

Third, it accounts for the existence of internally headed relative clauses, which simply realize overtly what the raising analysis takes to be the underlying structure of externally headed relative clauses. Examples of an internally headed relative and of the corresponding externally headed structure are given in (13), from Japanese (“head” noun italicized). This feature of the raising analysis should not be underestimated. While the raising analysis can explain the existence of two related relativization strategies by simply assuming that the “head” can raise at different points (before or after Spell-Out), alternative approaches have a harder time explaining why relativization can be realized through two different structures.

- (13) a. Yoko-wa [[Taro-ga sara-no ue-ni oita] *keeki*]-o tabeta.  
 YOKO-TOP TARO-NOM plate-GEN ON-LOC put cake-ACC ate  
 ‘Yoko ate a piece of cake which Taro put on a plate.’  
 b. Yoko-wa [[Taro-ga sara-no ue-ni *keeki*-o oita]-no]-o tabeta.  
 YOKO-TOP TARO-NOM plate-GEN ON-LOC cake-ACC put-NOMINALIZER-ACC ate  
 ‘Yoko ate a piece of cake which Taro put on a plate.’  
 (Shimoyama 1999:147)

While the three properties just discussed support any version of the raising analysis, the properties we are going to discuss now call for the version (stemming from Kayne 1994; see especially Bianchi 1999) that assumes that the determiner preceding the relative NP is externally merged: only the noun raises, while the determiner is inserted after the relative construction has been created by the relevant transformation. This type of raising approach is consistent with the fact that the external determiner must have wider scope than a quantifier inside the relative clause. This is shown with the Italian examples in (14), a *wh*-relative, and in (15), a *that*-relative. In the (a) sentences, the existential quantifier that is the external determiner of the NP that contains the relative clause must have wide scope. The (b) sentences show that a determiner that occupies the

position of the gap can take wide scope in the corresponding simple clause (these examples are modeled after (30) and (31) in Bianchi 1999:45–46).

- (14) a. Un'aula in cui ho mandato ogni studente (era molto rumorosa).  
 a room in which (I) have sent every student was very noisy  
 'A room where I sent every student was very noisy.'  
 $\checkmark \exists A * \forall E$
- b. Ho mandato ogni studente in un'aula. / Ho mandato in un'aula  
 (I) have sent every student in a room / (I) have sent in a room  
 ogni studente.  
 every student  
 'I sent every student to a room.'  
 $\checkmark \exists A \checkmark \forall E$
- (15) a. Un compito che ho distribuito a ogni studente (era troppo difficile).  
 an assignment that (I) have given to every student was too difficult  
 'An assignment that I gave to every student was too difficult.'  
 $\checkmark \exists A * \forall E$
- b. Ho distribuito un compito a ogni studente. / Ho distribuito  
 (I) have given an assignment to every student / (I) have given  
 a ogni studente un compito.  
 to every student an assignment  
 'I gave an assignment to every student.'  
 $\checkmark \forall A \checkmark \exists E$

The impossibility of the  $\forall E$  reading in the (a) sentences follows if the indefinite determiner is merged outside the relative clause, after the "head" of the relative clause has raised, under the standard assumption that a relative clause is a strong island (this explains why the universal quantifier is trapped inside the relative structure and cannot take wide scope in the (a) sentences).

Converging evidence comes from the lack of definiteness effects in structures like (16b). The grammaticality of (16b) is expected if the definite determiner is (or can be) externally merged and never is located inside the relative clause, where it would trigger a definiteness effect, as shown in (16a).

- (16) a. \*There were the men in the garden.  
 b. the men that there were in the garden

In fact, even with idiomatic expressions whose direct object is obligatorily indefinite (note the ungrammaticality of (17a)), the relativized head can be introduced by a definite determiner, as (17b) shows.

- (17) a. \*They made the fun of me.  
 (Fabb 1990:71)  
 b. the fun that they made of me

In the literature on relative clauses, another type of evidence that is commonly taken to support the raising analysis is the (alleged) existence of reconstruction effects with the relative clause head. However, this point requires a full-blown discussion, which we defer until section 7.2.

Summarizing, several considerations strongly support the raising analysis, and, more specifically, the version that assumes that the NP (the “head”) is merged with the determiner after the former has raised from inside the relative clause. Notwithstanding its merits, the raising analysis remains controversial, since it faces some serious problems. These are illustrated in the next section.

## 5 A HEAD-Raising Analysis for Relative Clauses

A severe critique of the raising analysis is due to Borsley (1997), who mentions several problems. One is particularly serious and relevant for our purposes. This problem has to do with word order in *wh*-relatives. Assuming that *wh*-elements such as *which* are determiners, the raising analysis directly predicts that in *wh*-relatives, after raising of the relative clause “head,” the structure should be (19), not (18).

(18) the book which John saw

(19) the [[which book] John saw ~~which book~~]

Various solutions proposed by advocates of the raising analysis include stipulations that are not independently motivated. To derive the correct word order, many assume an unmotivated movement of *book* in (19), stranding the determiner *which*—a movement that moreover turns a specifier (the NP *book*) into something accessible to selection by an external head (the D head *the*). Iatridou, Anagnostopoulou, and Izvorski (2001) resolve this problem by postulating that the moved category can project (this is assumed by Bhatt (2002) as well). However, this solution generates yet another problem for the raising analysis at a more general theoretical level: the more familiar instances of movement (e.g., *wh*-movement, raising, passive movement) never involve a projecting movement. In all these cases, it is the target that projects. It is then necessary to explain why the moved category can project only in relative clauses, and not in the more familiar cases. While this was never explained in previous work, it is straightforwardly explained by adopting the perspective on labeling outlined in section 2 and the approach to free relatives defended in section 3.

The crucial feature that we will capitalize on is that, under the Probing Algorithm (3), any lexical item has the power to transmit its label both in the case of external Merge and in the case of internal Merge (movement). A case in which a lexical item “projects” in a movement configuration is provided by free relatives when they have a nominal distribution ([<sub>DP</sub> *What you say*] *is horrible*). Ordinary relatives are just another case of this sort. Consider a *wh*-relative like (18), repeated in (20).

(20) the book which John saw

Under a Bianchi/Kayne-type version of the raising analysis, the first step of the derivation (see (21a)) is obvious. However, (21a) is problematic in two respects. First, as just mentioned, the word

order is wrong. Second, the label of the structure with which the external determiner combines is equally wrong, since a determiner combines with an NP, not with a CP. Clearly, the desired configuration is something like (21b), but the problem is how to get from (21a) to (21b)—namely, how to derive the “projecting nature” of the movement of *book*.

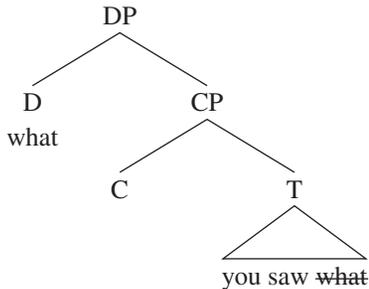
- (21) a. [<sub>DP</sub> the [<sub>CP</sub>[<sub>DP</sub> which book] John saw ~~which book~~]]  
 b. [<sub>DP</sub> the [<sub>NP</sub>[[<sub>NP</sub> book] [<sub>CP</sub>[<sub>DP</sub> which ~~book~~] John saw ~~which book~~]]]]

However, assuming the Probing Algorithm (3), the “projecting nature” of the movement of *book* in (21) is predicted: *book* is a lexical item; therefore, it has an edge feature and acts as a probe when it is externally merged with C. By (3), it relabels the structure and allows it to combine with the external determiner.

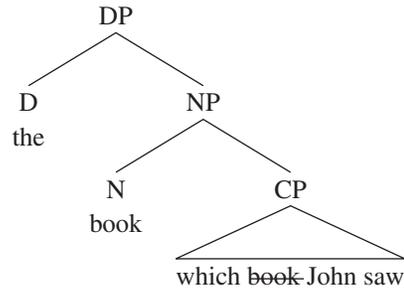
We call our proposal the *HEAD-raising analysis* because the crucial feature is that what raises must be a lexical item (“head”).

It is worth comparing the derivation of a free relative with a nominal distribution with the derivation of a *wh*-relative; see (22). In both cases, the crucial point is that a lexical item “projects” when it is externally merged. The main difference is that the lexical item is a determiner in free relatives, but a noun in (*wh*) relatives.

(22) a. *Free relative*



b. *Wh-relative*



Now, what is the precise landing site of N in structures like (22b)? Clearly, N moves to some position in the CP area. To identify the position exactly, it is instructive to consider again the Japanese sentences in (13), repeated here.

- (23) a. Yoko-wa [[Taro-ga sara-no ue-ni oita] *keeki*]-o tabeta.  
 Yoko-TOP Taro-NOM plate-GEN on-LOC put cake-ACC ate  
 ‘Yoko ate a piece of cake which Taro put on a plate.’  
 b. Yoko-wa [[Taro-ga sara-no ue-ni *keeki*-o oita]-no]-o tabeta.  
 Yoko-TOP Taro-NOM plate-GEN on-LOC cake-ACC put-NOMINALIZER-ACC ate  
 ‘Yoko ate a piece of cake which Taro put on a plate.’  
 (Shimoyama 1999:147)

Interestingly, when the relative clause head *keeki* does not move (namely, in the internally headed relative in (23b)), the nominalizer particle *no* surfaces in the right periphery of the relative clause.

This particle is not present when *keeki* moves. In our approach, this can be interpreted as an indication that in (23a) *keeki* moves to the structural position that is occupied by the nominalizer particle in (23b). The particle is not needed in (23a), since the movement of *keeki* can relabel the structure by turning it into a nominal constituent.

We propose that the “projecting” noun in English and Italian moves to the same slot in the CP area that is overtly visible in Japanese. We leave it to future research to identify the precise location of this structural position in the fine structure of the CP area (see Rizzi 1997). In section 8, we will discuss the trigger of the nominalizing movement of N.

We conclude this section by stressing that, to the best of our knowledge, the HEAD-raising account is the only attempt to offer a principled solution both for the word order problem that affects other versions of the raising analysis and for the particular restrictions on projecting movement.

## 6 Fixing Two More Problems for the (HEAD-) Raising Analysis

Borsley (1997) mentions at least two more problems for the raising analysis, but they are less severe, since possible solutions have been discussed in the previous literature. In this section, we show how the HEAD-raising analysis can deal with them.

Many Indo-European languages have two different types of relatives. Besides the structures we have just discussed, introduced by a relative pronoun, they display relatives introduced by a complementizer corresponding to English *that*. A problem mentioned by Borsley (1997) is that, assuming the raising analysis, a determiner appears to be missing in *that*-relatives: two determiners are predicted to be involved, the one internal to the relative clause (corresponding to the *wh*-determiner), and the external one, selecting the entire relative NP. However, only the latter surfaces in *that*-relatives, as the ungrammaticality of (24a) shows.

- (24) a. \*the the man that I saw  
 b. [the [[the man] that I saw ~~the man~~]]

We will assume that a null determiner (italicized in (25)) is stranded in the base position of the noun head, before the noun head raises and projects. This is similar to what is assumed by proponents of the traditional raising analysis, such as Bianchi (1999).

- (25) [<sub>DP</sub> the [<sub>NP</sub>[[<sub>NP</sub> man] [<sub>CP</sub> that I saw [<sub>DP</sub> *D* ~~man~~]]]]]

Assuming an invisible category is a brute stipulation if this category is never directly detectable. However, the stranded determiner *is* visible in many languages. The relevant evidence, as Bianchi (1999) observes, is provided by resumptive pronouns in relatives in (substandard) Romance varieties, illustrated in (26). Since resumptive pronouns are homophonous with definite articles, we analyze them as the stranded head of the DP from which the N has moved out.

- (26) l'uomo che l' ho visto (Substandard Italian)  
 the man that (I) the.MASC have seen  
 'the man I saw'

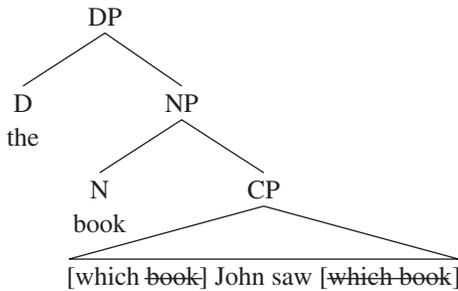
Crucially, the distribution of resumptive pronouns of this kind is restricted to *that*-relatives, as the raising analysis predicts. In Italian, resumptive pronouns are not attested in *wh*-relatives, even in those substandard varieties that allow them in *that*-relatives: if resumptive pronouns are determiners just like *wh*-elements, they are clearly predicted to be complementary in distribution.

- (27) \*l'uomo a cui gli ho parlato  
 the man to whom (I) the.MASC have spoken  
 'the man I spoke to'

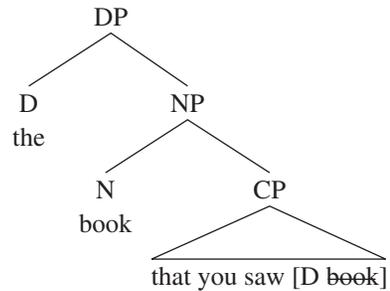
It can be shown that the strategy illustrated with (26) is quite general across Romance and Semitic varieties (see, e.g., Borer 1984), since all these varieties display clear evidence that so-called resumptive pronouns are determiners.

To clarify the analysis, a comparison between *wh*-relatives and *that*-relatives is useful.

(28) a. *Wh-relative*



b. *That-relative*



Our analysis raises a natural question. Non-*wh*-determiners, which in certain varieties are overtly realized as resumptive pronouns, are stranded inside the T area of the relative clause in *that*-relatives (see (28b)). However, *wh*-determiners are stranded in the CP area of the relative clause in *wh*-relatives (see (28a)). Why do the stranded determiners end up in different positions? A natural explanation involves locality. If the determiner is endowed with a *wh*-feature (see (28a)), it is visible to the root C. Therefore, the *wh* D-label is closer than the N to C, and the entire DP is attracted to C. If the determiner is not endowed with a *wh*-feature (see (28b)), N can move alone since the D-label no longer acts as an intervener. A related issue is that head movement in configurations like (28b) violates the Head Movement Constraint. However, see Roberts 2001, Surányi 2005, 2007, 2008, Donati 2006, and Cecchetto and Donati, 2010, among others, for approaches assuming that head movement is not restricted by such a condition.

Finally, note that our approach, like other versions of the raising analysis, can deal with still another problem raised by Borsley (1997). He observes that in sentences like (29), the very same DP should get two cases, nominative in the relative clause and accusative in the matrix clause. Similarly, in (30) the very same DP should get nominative in the matrix clause and accusative in the relative clause. This raises a problem under the standard assumption that a DP can check/ be assigned just one grammatical case.

(29) I saw the man that D ~~man~~ left.

(30) The man that I saw D ~~man~~ left.

In fact, as the Polish example (31) shows, in languages with morphological case the DP is assigned the “matrix” case.

(31) Widziałem tego pana, który zbił ci szybę.  
 saw.1SG the.ACC man.ACC who.NOM broke your glass  
 ‘I saw the man who broke your glass.’  
 (Borsley 1997:635)

The case mismatch problem receives a natural explanation under our analysis: in both *wh*-relatives and *that*-relatives, we assume there are two DPs that share the same N head. The lower DP (with a *wh*- or null D) gets nominative; the higher DP gets accusative (but see Brattico 2010 for an in-depth analysis of case distribution inside the DP).

In the HEAD-raising analysis, what moves in externally headed relatives is always a noun, which, by virtue of being a lexical item, can relabel and nominalize the structure according to the Probing Algorithm (3). The HEAD-raising analysis can be shown to be immune to problems that affect other versions. However, an open question remains: we have not yet identified the trigger of the head noun raising (for discussion of this important issue, see section 8). Also, we need to cope with what looks like an obvious counterexample: in many cases, the nominal constituent that is modified by the relative clause is not a simple noun, but a phrase. Putting it in other terms, the “head” of the relative clause does not need to be a head (in the sense of phrase structure theory). (32) is just one example.

(32) the [[book about Obama] which you bought]

The next section is devoted to this issue. In fact, as we will show, far from being a problem, the pattern of relative clauses with a phrasal “head” turns out to support the HEAD-raising analysis.

## 7 Relative Clauses with a Phrasal “Head”

The problem that structures like (32) pose for the HEAD-raising analysis should be clear enough. Under the Probing Algorithm (3), even if *book about Obama* moves, it cannot relabel the structure, which preserves the wrong CP label and therefore cannot be selected by the external determiner. So, the wrong step of the derivation is (33b).

(33) a. \*<sub>[DP the [<sub>CP</sub>[<sub>DP</sub> which book about Obama] you bought  
           [~~which book about Obama~~]]]</sub>

      b. \*<sub>[DP the [<sub>CP</sub>[<sub>NP</sub> book about Obama] [<sub>CP</sub>[<sub>DP</sub> which [<sub>NP</sub> ~~book about Obama~~]  
           [<sub>NP</sub> you bought [<sub>DP</sub> ~~which book about Obama~~]]]]]</sub>

In fact, we only have one way out if we want to maintain the gist of our proposal: we must assume that whatever material modifies the head noun (*about Obama* in (33)) can (and must) be

late-merged, after the head noun has moved and has “re-labeled” the structure. In this section, we defend this assumption. In section 7.1, we show that so-called complements of nouns do not pose any special obstacle to the late-Merge analysis. In section 7.2, we show that reconstruction effects offer independent evidence in support of the late-Merge analysis of modifiers of the head noun.

### 7.1 *Arguments of Nouns May Be Late-Merged*

The idea that adjuncts can be merged late in the derivation has been extensively used and is not particularly controversial. The reason is that adjuncts are exempted from the  $\theta$ -Criterion, the condition that forces arguments to be inserted in the derivation as early as the predicates they receive a  $\theta$ -role from. The difficult case for the HEAD-raising analysis is (alleged) complements of nouns in structures like (34). From now on, we will refer to a noun modifier that is commonly considered a complement of the noun as “*complement*,” since we are going to argue against its status as genuine complement.

(34) the destruction of the city which you witnessed

Here as well, we are forced to say that *of the city* is late-merged, after the noun *destruction* has raised and relabeled the structure. In this sense, we are forced to say that nouns do not assign  $\theta$ -roles and, in this respect, their “arguments” behave like adjuncts. We think that several considerations indicate that this assumption is not only defensible but also motivated on independent grounds.

**7.1.1 Omissibility** In the verbal domain, one key criterion for distinguishing elements that obey the  $\theta$ -Criterion (arguments) from elements that do not (adjuncts) is that the former must be expressed while the latter can be omitted (of course, this requires abstracting away from verbs that enter a transitive/intransitive alternation, where the absence of the internal argument may be attributed to the intransitive form of the verb).

(35) They destroyed the city last week.

(36) \*They destroyed last week.

(37) They destroyed the city.

With “complements” of the noun, the situation is sharply different. As Adger (2009:8) observes, “Overwhelmingly, complements of nouns are always optional in a way that complements of verbs only sometimes are. Furthermore, this generalization is very robust crosslinguistically, so it seems to be a property of the categories N and V, rather than a property of words which are of those categories.”

In fact, in order to maintain approaches stemming from Chomsky 1970 that take nouns to be able to assign  $\theta$ -roles just like verbs do, it is necessary to postulate that the  $\theta$ -Criterion behaves differently depending on whether it applies to nouns or verbs. However, this is a brute-force stipulation and should be avoided if possible. Certain accounts deny that a distinction between argument and adjunct can be drawn in the nominal domain, and they argue that nouns cannot assign  $\theta$ -roles. Typically, these accounts are couched in a Davidsonian framework (Higginbotham

1985 and Dowty 2003 are two classic references, but see also Hale and Keyser 2002 and Kayne 2009 for arguments that nouns cannot take complements). Such accounts are in the same spirit as our assumption that the modifier of the head noun of the relative clause is always an adjunct-like element.

However, these accounts confront an empirical problem: namely, as extensively discussed by Grimshaw (1990), there is a class of nouns (Grimshaw labels them *complex-event nominals*) that *do* require a “complement.” Take the noun *assignment*. It has two interpretations: in (38a), it can refer to a concrete entity; in (38b), it refers to an event.

- (38) a. The assignment is on one page.  
 b. The assignment of the problem took a long time.

The addition of *constant*, as in (39b), forces the complex-event reading of the noun. Crucially, on this reading *assignment* requires a “complement,” as shown by the awkwardness of (40), whose status is similar to that of (41).

- (39) a. The assignment is to be avoided.  
 b. The constant assignment of unsolvable problems is to be avoided.  
 (40) \*The constant assignment is to be avoided.  
 (41) \*We constantly assign.

The use of modifiers like *constant* is just one of several tests that Grimshaw proposes to unambiguously pick up the complex-event reading of nouns. Crucially, when this disambiguation test shows that a noun can have only a complex-event reading, it appears that the noun requires an argument.

At this point, one possibility would be to assume that on the complex-event reading nouns assign  $\theta$ -roles and that whatever explains the deviance of (41) (say, a violation of the  $\theta$ -Criterion) carries over to cases like (40). This assumption would be problematic for our analysis of relative clauses, which assumes that nouns are not  $\theta$ -role assigners. However, Grimshaw takes a different tack on this problem and maintains that nouns, even on their complex-event reading, are *not*  $\theta$ -role assigners, even though they appear to require an argument. Let us first discuss the evidence for denying that nouns ever assign  $\theta$ -roles and then turn to Grimshaw’s alternative account.

First, Grimshaw notes that if a complex-event nominal could assign a  $\theta$ -role to its argument, the counterpart of passivization ought to be observed. In fact, passive nominals do exist (see (42a) on the reading where the politician gets nominated). Crucially, however, they become unavailable on the complex-event reading forced by the use of the modifier *constant* (note the oddity of (42b) on the relevant reading).

- (42) a. the politician’s nomination  
 b. \*the politician’s constant nomination

Another reason why Grimshaw denies that nouns can assign  $\theta$ -roles is that complex-event nominals cannot take CP complements. This observation goes back to Stowell (1981), who notes that nouns with sentential complements do not have the meaning of process nouns. Thus, *observation* in (43) refers not to the event of observing but to the content of the observation.

- (43) Their observation that the position had been filled surprised everyone.

Not surprisingly, the use of the modifier *constant*, which forces the complex-event reading, is incompatible with the CP complement of the noun.

(44) \*Their constant announcement that they were the greatest eventually became tiresome.

Of course, verbs can take CP complements and can be passivized; therefore, Grimshaw concludes that nouns (even those that appear to require an argument) are unlike verbs and do not assign a  $\theta$ -role. Her alternative account maintains that nouns are always deficient  $\theta$ -role assigners. However, in order to have an argument, a noun can take advantage of the presence of the preposition, which is the actual  $\theta$ -role assigner. For example, in (39b) it is the preposition *of* that assigns a  $\theta$ -role to *unsolvable problems*. In turn, Grimshaw proposes, the argument structures of the noun and the preposition are linked by “identification,” the operation proposed by Higginbotham (1985) for modification. In Higginbotham’s account, modification of the noun *dissertation* in the expression *long dissertation* is accomplished by “identification” of the argument of the modifier with the argument of the noun. Similarly, in (39b) the argument structure of the noun *assignment* is transmitted to the preposition *of* by “identification,” and the preposition  $\theta$ -marks *unsolvable problems*.

This can explain why passive nominals are not allowed with complex-event nominals (see (42b)) and why these nominals cannot take CP complements (see (44)). In both of these problematic cases, a preposition is absent and the noun cannot have an argument, since it is a defective  $\theta$ -role assigner.

To summarize Grimshaw’s account: Nouns do not obligatorily take “complements,” except for a special class, the complex-event nominals. However, even these nouns are unlike verbs, in that they cannot be passivized or take CP complements. In fact, these nouns take an argument only with the help of a preposition, which is the real  $\theta$ -role assigner. The link between the complex-event noun and the preposition is akin to the link between an adjective and the noun it modifies, namely, “identification.”

We conclude that if, as standardly assumed, late Merge is possible whenever the late-merged element does not receive a  $\theta$ -role from the category it is late-merged with, it is possible to claim that any modifier is late-merged with the head noun of the relative clause. Crucially, this conclusion can be maintained even for the most recalcitrant cases, namely, the small subset of nouns that seem to require a “complement.”

**7.1.2 Constituency Tests** In the clausal domain, standard constituency tests indicate that the verb and the internal object form a minimal constituent. For example, ellipsis in (45) elides, and the proform in (46) replaces, the complex constituent *buy a house*. However, (47) and (48) are sharply ungrammatical since ellipsis and proform replacement apply to the group of words *will buy* (excluding the internal argument *a house*), which is not a constituent.

(45) John will buy a house and Mary will ~~buy a house~~ too.

(46) John will buy a house and Mary will do that too.

(47) \*John will buy a house and Mary ~~will buy~~ a house too.

(48) \*John will buy a house and Mary do that a house too.

Similarly, it is well known that the unit formed by subject and verb cannot be elided or replaced by a proform. This shows that subject and verb do not form a constituent that excludes the object.

Observations like this motivate the Verb-Object Constraint (Baker 2009)—one of the best candidates for a language universal, as Baker discusses.

Strikingly, as Chiara Branchini (pers. comm.) notes, if we apply the same type of constituency tests to the unit formed by the noun and its “complement,” the results are quite different. In Italian, the proform *quello* ‘that (one)’ (fem. *quella*) can replace the unit formed by determiner and noun, crucially excluding the “complement” of the noun (see (50)). Similarly, the unit formed by determiner and noun can be fronted, while the “complement” is stranded (see (51)). Finally, in a cleft structure the postcopular unit can be formed by determiner and noun, while the “complement” of the noun remains in the postcopular clause (see (52)).

- (49) Ho visto *la foto* di Gianni.  
 (I) have seen the picture of Gianni  
 ‘I saw the picture of Gianni.’  
 a. [<sub>DP</sub> la [<sub>NP</sub> foto [<sub>PP</sub> di Gianni]]]  
 b. [<sub>DP</sub> la [<sub>NP</sub> foto]] [<sub>PP</sub> di Gianni]
- (50) Ho visto *quella* di Gianni.  
 (I) have seen that of Gianni
- (51) LA FOTO ho visto di Gianni (non il ritratto).  
 the picture (I) have seen of Gianni (not the portrait).  
 ‘THE PICTURE I saw of Gianni (not the portrait).’
- (52) E’ la foto che ho visto di Gianni.  
 is the picture that (I) have seen of Gianni  
 ‘It is the picture that I saw of Gianni.’

The facts are similar in English, as shown by sentences like (53) in which *that* replaces determiner plus noun, excluding the “complement” of the noun.

- (53) I have already seen the picture of John, but I haven’t yet seen that of Mary.

This pattern shows that at some level of representation, determiner and noun form a unit that excludes the “complement” of the noun, but this is not expected if the standard representation in (49a)—assuming that the head combines with its complement before any higher category is inserted—holds at any level of representation. However, if the “complement” (*di Gianni*) can be late-merged as in (49b), the pattern in (50)–(53) can be explained by assuming that replacement by a proform (50), fronting (51), and whatever operation is responsible for cleft structures (52) operate on the constituent *la foto* before *di Gianni* is late-merged.

A reviewer suggests that the expression in (50) (and similarly for the other cases, like (53) in English) might be the result of an operation applying to the entire nominal constituent out of which the “complement” of the noun has moved. In (50), then, *di Gianni* might be right-dislocated and *quella* might replace the entire DP minus the right-dislocated PP. However, this analysis is

unlikely. First, right-dislocation of *di Gianni* in (50) would be string-vacuous. Second, (50) lacks the typical prosodic contour of right-dislocation structures in Italian (i.e., there is no intonational break before the dislocated constituent; see Cecchetto 1999 on the properties of right-dislocation).<sup>5</sup> In any case, what is important here is that traditional constituency tests yield strongly divergent results with noun “complements” and verb complements.

Let us now try to be more precise about the attachment site of the “complement” of the noun when it is late-merged. In representation (49b), we suggest that it can be late-merged with the constituent D + N. However, this conclusion is not forced in the HEAD-raising analysis, since it is also compatible with late Merge of the “complement” directly with N, as long as late Merge takes place after N has relabeled the structure by virtue of being a lexical item.

In fact, we suspect that both late-Merge options are available. On the one hand, structures like (54a–b) indicate that the “complement” is late-merged with N, since, were it late-merged with D + N, the “complement” would surface after the relative clause.<sup>6</sup>

- (54) a. The picture of John that I prefer is on the top.  
 b. La foto di Gianni che preferisco è lì sopra.

On the other hand, there is some evidence that the “complement” can also be late-merged with the constituent D + N. As a reviewer observes, even with complex-event nominals, for reasons that are partly unclear the obligatoriness of the “complement” of the noun partially depends on the choice of the determiner. With an agent “possessor,” it is easier to find examples in which the *of*-phrase cannot be omitted.

- (55) a. John’s destruction \*(of the evidence) was done in secret.  
 b. The destruction (of the evidence) was done in secret.  
 (56) a. Our reinstatement \*(of the graduate student) was a big mistake.  
 b. That reinstatement (of the graduate student) was a big mistake.

In a similar vein, Grimshaw (1990) observes that complex-event nominals disallow indefinite determiners (*an exam*/\**an examination of the papers*) and cannot be preceded by a demonstrative determiner (*that exam*/\**that examination of the papers*).

That the determiner (co)determines the distribution of the “complement” of the noun is easily captured if the “complement” modifies not N alone, but the bigger unit to which D itself

<sup>5</sup> The same reviewer asks whether *quello* can replace N alone. The answer is no. Bare nominals are not allowed in Italian in sentences like (49); compare the ungrammaticality of (i). If *quello* replaced N alone in (50), the resulting structure could be ruled out by whatever condition excludes the bare nominal in (i).

(i) \*Ho visto fotografia di Gianni.  
 (I) have seen picture of Gianni

<sup>6</sup> At least in Italian, the “complement” of the noun can appear after the relative clause, as in (i). This is consistent with late Merge of *di Gianni* with D + N.

(i) la foto che preferisco di Gianni  
 the picture that (I) prefer of Gianni

belongs. This is somewhat reminiscent of what happens in the clausal domain. A standard argument for assuming that the external  $\theta$ -role is assigned by the unit formed by verb plus object is that the type of object influences the type of  $\theta$ -role assigned to the external argument (note the famous contrast between *He broke his arm* and *He broke the window*). Here we see the same pattern, although reversed: depending on the type of determiner, the “complement” of the noun may or may not be obligatory, suggesting that the “complement” of the noun is in fact a modifier of the entire D+N unit (at least in cases like (55a–b) and (56a–b)).

In this section, we have shown that standard tests indicate that D+N can form a minimal constituent that excludes the “complement” of N. This is not compatible with a representation in which the “complement” of the noun is a real complement, which is merged with N before N is merged with D. If the “complement” is *late*-merged with N (or with D+N), the pattern emerging from constituency tests can be explained.

**7.1.3 Islandhood** Another familiar way to distinguish arguments from adjuncts is based on their islandhood status. In the verbal domain, there is an argument/adjunct asymmetry: adjunct clauses are islands for extraction; extraction from argument clauses is much easier. Again, we observe a fundamental difference in the nominal domain: here, the argument/adjunct asymmetry is much weaker, since both relative clauses and complement clauses of the noun are islands. This common pattern is captured by assuming the Complex NP Constraint. With respect to islandhood, then, adjuncts to the noun and “complements” of the noun pattern alike, suggesting that a common analysis in terms of late Merge may be on the right track.

Note that extractability *from* the PP modifier of the noun (its islandhood) is not to be confounded with extractability *of* the PP. While all modifiers of the noun (including “complements”) are islands for extraction, suggesting that they have an adjunct-like status, different types of PP modifiers of the noun are extractable to a different degree. For example, there is a sharp contrast between sentences like (57) and sentences like (58).

(57) Of whom did you see [a painting ~~of whom~~]?

(58) \*??From where did you see [a painting ~~from where~~]?<sup>7</sup>

Although it is sometimes said that the contrast in (57)–(58) illustrates an argument/adjunct asymmetry, this conclusion is too quick. For example, *by whom* in (59) would normally be categorized as an argument of the noun, but its extraction produces a degraded result.

(59) \*??By whom did you see [a painting ~~by whom~~]?

In addition, the type of preposition plays an important role, with prepositions like *of* favoring extractability. This can be shown in Italian, where the counterpart of *of* (*di*) may introduce a PP

<sup>7</sup> In fact, the degraded status of sentences like (58) might be due to a parsing problem, since they violate the principle of Late Closure (“If grammatically permissible, attach new items into the clause or phrase currently being processed—that is, the clause or phrase postulated more recently”). See Frazier 1987 for discussion of Late Closure.

that is not an argument in any obvious sense (see (60a)). Still, even if the PP in (60) is not an argument, it can easily be extracted (see (60b)).

- (60) a. Ho comprato il maglione di colore rosso.  
 (I) have bought the sweater of color red  
 ‘I bought the red-colored sweater.’  
 b. Di che colore hai comprato il maglione?  
 of what color (you) have bought the sweater  
 ‘Of what color did you buy the sweater?’

The opposite situation exists as well. In Italian, there are cases where the ‘complement’ of the noun can be introduced either by the preposition *di* ‘of’ or by the preposition *a* ‘at’. For example, (61) and (62) have the same meaning.

- (61) Ho letto una recensione a *Guerra e Pace*.  
 (I) have read a review to *War and Peace*  
 (62) Ho letto una recensione di *Guerra e Pace*.  
 (I) have read a review of *War and Peace*

Strikingly, the PP can be extracted only with *di*.

- (63) Di quale libro hai letto una recensione?  
 of what book (you) have read a review  
 ‘Of what book did you read a review?’  
 (64) \*A quale libro hai letto una recensione?  
 to what book (you) have read a review

If what governs PP-extraction were the argument/adjunct status of the PP, (63) and (64) should be on a par, contrary to what is observed. These sentences confirm that what makes a difference is the type of preposition involved.

It is not crucial for our purposes here to investigate why prepositions like *of* favor extractability of the PP modifiers of the noun. It suffices to point out that the extraction pattern of PPs cannot be straightforwardly reduced to an argument/adjunct asymmetry.<sup>8</sup>

<sup>8</sup> A reviewer points out that the contrast between (i) and (ii) may be captured only by the raising analysis, since under a nonraising (matching) analysis the DP *two photos* occupies the same position in (i) and (ii).

(i) \*Which landmark did you like two photos [<sub>PP</sub> of which-landmark] that you made?

(ii) Which landmark did you like two photos [<sub>PP</sub> of which-landmark]?

Under any version of the raising analysis (including the HEAD-raising analysis), (i) might be excluded by whatever condition blocks subextraction from a left branch, provided that such a condition can be defined in a way that selectively allows subextraction when this is possible (see Rizzi 2007 for discussion of such cases). Interestingly, the HEAD-raising analysis opens up another perspective for explaining the ungrammaticality of (i): it can be related to the fact that only in (i) is late Merge of the PP obligatory for relabeling reasons; in (ii), nothing blocks early Merge. A natural assumption is that (overt) extraction out of a late-merged category is impossible, since this would introduce a countercyclic movement step in overt syntax.

**7.1.4 Ne-Cliticization Pattern** In this section, we discuss an independent argument in favor of the hypothesis that the “complement” of the head noun of a relative is late-merged. This argument is based on the pattern of *ne*-cliticization in relative clauses. One of the uses of the clitic *ne* in Italian is illustrated in (65). In (65b), *ne* is a proform for the PP ‘of the meeting’—that is, the “complement” of the noun ‘summary’.

- (65) a. Ho scritto un riassunto della riunione.  
 (I) have written a summary of.the meeting  
 b. Ne ho scritto un riassunto.  
 of.it.CL (I) have written a summary  
 ‘I wrote a summary of it.’

However, if the PP to which *ne* corresponds modifies the “complement” of the head noun of a relative clause, *ne*-cliticization becomes sharply ungrammatical.

- (66) a. Ho letto un riassunto della riunione che tu hai scritto.  
 (I) have read a summary of.the meeting that you have written  
 b. \*Ho letto un riassunto che tu ne hai scritto.  
 (I) have read a summary that you of.it.CL have written

Our account directly predicts the ungrammaticality of (66b) and similar sentences. *Ne*-cliticization is impossible because any modifier of the head noun ‘summary’ (including the clitic material) can be merged only after the head noun has moved to the left periphery and relabeled the structure. This means that the surface position of the clitic *ne* is lower than the position in which it is inserted into the derivation. So, the derivation of (66b) involves a lowering movement and this explains the deviance of the sentence.

Notice that the ungrammaticality of (66b) is not due to a generic ban against moving the category out of which *ne* moves. In fact, *ne*-cliticization is possible if the DP where the clitic is initially located moves for reasons other than relativization. In (67), the movement of the DP is due to passivization, and in (68), it is an ordinary case of *wh*-movement. In both cases, *ne*-cliticization is felicitous.

- (67) Un riassunto ne è stato scritto [~~un riassunto~~ ne].  
 a summary of.it.CL is been written  
 ‘A summary of it was written.’  
 (68) Quanti riassunti ne sono stati scritti [~~quanti riassunti~~ ne]?  
 how.many summaries of.it.CL are been written  
 ‘How many summaries of it were written?’

The acceptability of (67) and (68) is expected in our system, since the “complement” of the noun does *not* need to be late-merged in the general case. It *must* be late-merged only if it attaches to the head of the relative clause; otherwise, relabeling cannot take place. In (67) and (68), (early) Merge of the clitic “complement” in the argumental position of the DP is possible, since no

relabeling is involved in passivization and interrogatives. Accordingly, these sentences do not involve any lowering movement of the clitic.

### 7.2 Reconstruction Effects

The hypothesis that the material that modifies the head noun of the relative clause is late-merged makes a precise prediction concerning reconstruction effects: since the head noun has moved from within the relative clause, assuming the copy theory of traces, it should behave as if it were in its base position as far as Condition C is concerned. However, if any material that modifies the head noun is late-merged, no Condition C violation should be triggered by this material, since no trace/copy of the modifier is present in the gap position of the relative clause. This prediction is borne out by the sharp contrast between (69) and (70).

(69) the professor of John<sub>i</sub>'s that he<sub>i</sub> always praises

(70) \*the professor<sub>i</sub> that he<sub>i</sub> always praises

Here, the very degraded status of (70) under the relevant interpretation can be clearly reduced to a Condition C effect (cf. \**He<sub>i</sub> always praises the professor<sub>i</sub>*), and the acceptable status of (69) can equally be explained if Condition C is not violated because no reconstruction takes place. However, the vast literature on reconstruction effects in relative clauses (see, e.g., Vergnaud 1974, Munn 1994, Bianchi 1999, Safir 1999, Sauerland 2003, Cecchetto 2006) has neglected the contrast illustrated in (69)–(70). The reason is that this literature has focused on the presence or absence of reconstruction effects as an argument for or against the traditional version of the raising analysis, namely, the version that assumes that what raises is the noun *plus the material that modifies it*. From this point of view, the contrast in (69)–(70) is puzzling, since (69) would provide evidence against the raising analysis while (70) would support it. However, the HEAD-raising analysis does predict this contrast.

Having said this, we briefly review other data discussed in the literature. One argument often used to support the traditional version of the raising analysis is the presence of reconstruction effects (= absence of Condition A effects) in sentences like (71).

(71) The picture of himself [that John likes *e* most] (was never on display).

Note that the grammaticality of (71) is not expected under the HEAD-raising analysis, which assumes that *of himself* is late-merged. How can this be explained? In fact, (71) poses a problem under any analysis of relative clauses, since it stands in direct contrast to data like (69). As initially observed by Munn (1994), the diagnostic based on Condition C and the one based on Condition A give opposite results when they are applied to the modifier of the head noun. In the case at hand, we observe a dissociation between Condition C reconstruction effects, which are missing (see (69)), and Condition A reconstruction effects, which are attested (see (71)).

In the literature, two strategies have been employed to overcome the puzzle introduced by the sentence pair (69) and (71). One is due to Sauerland (2003) and Hulsey and Sauerland (2009), who use this dissociation between Condition A and Condition C as evidence that relative clauses

are structurally ambiguous between a raising analysis and a nonraising matching analysis (see Carlson 1977 and Heim 1987 for earlier claims that relative clauses are structurally ambiguous, and Bhatt 2002 for independent evidence for this claim). If relative clauses are given (a traditional form of) the raising analysis, Condition A reconstruction effects are expected (see the fact that the anaphor is bound in (71)). If relative clauses are given a nonraising (matching) analysis, the head NP is merged outside the relative clause and there is an elided NP inside the relative clause that must be similar enough to the head NP for the purposes of ellipsis licensing. Therefore, no Condition C reconstruction effect is expected, for the R-expression in the relative clause head is not c-commanded by the material inside the relative clause (see the fact that *John* is not illicitly bound in (70)). Sauerland's approach explains the dissociation between (69) and (71), but is theoretically very costly. As Cecchetto (2006) observes, Sauerland's approach introduces an undesirable redundancy in the theory, because relative clauses are treated on a par with sentences like *Flying planes can be dangerous*. As a result, it multiplies the cases of structural ambiguity. Furthermore, it faces the empirical problem of explaining the presence of Condition C reconstruction effects in sentences like (70), which Sauerland does not discuss.

The second way to deal with the unexpected dissociation between (69) and (71) is to deny the reliability of either (69) or (71). Both Bianchi (2000) and Cecchetto (2006) question the diagnostic based on Condition A reconstruction effects and claim that data like (71) are not reliable because of a serious complicating factor: since DPs can have an implicit subject PRO (see Giorgi and Longobardi 1991, esp. chap. 4, for this observation and for extensive evidence), one cannot exclude the possibility that the anaphor in cases like (71) is actually bound by PRO, which occupies the subject position of the NP, as shown in (72).

- (72) [<sub>DP</sub> The [<sub>NP</sub> PRO<sub>i</sub> picture of himself<sub>i</sub>] [that John<sub>i</sub> likes ~~picture~~ most]] (was never on display).

If the representation in (72) is correct, the absence of a Condition A effect does not need to be interpreted as a case of reconstruction, because the position that *himself* overtly occupies is c-commanded by a suitable antecedent, PRO. In turn, PRO is controlled by *John*, but this control configuration is a case of backward pronominalization that does not require c-command. So, in order to explain the grammaticality of (71), it is *not* necessary to assume that a copy of the entire picture-NP is found in the complement position of the verb *like*. To support his view, Cecchetto discusses (73), a case in which the absence of a Condition A effect in a relative clause not only can but must be treated as a case of binding by an implicit PRO.

- (73) La descrizione di se stesso [che ~~descrizione~~ aiuterebbe Gianni a passare l'esame]  
 the description of himself that help.COND Gianni to pass the exam  
 (non è stata presa in considerazione dalla commissione).  
 (was not considered by the committee)

The acceptability of (73) cannot be due to the fact that the anaphor *se stesso* 'himself' is interpreted in the position of the gap; that is, (73) cannot be a case of reconstruction. This is so because the position of the gap (the subject position of the relative clause) is not c-commanded by the alleged

antecedent of the anaphor (*Gianni*). The only way to explain the acceptability of (73), then, is to assume that PRO in the subject position of the complex NP acts as a binder of the anaphor, as shown in (74). PRO in turn is backward-controlled by *Gianni*.

- (74) [<sub>DP</sub> la [<sub>NP</sub> PRO<sub>i</sub> descrizione di se stesso]<sub>i</sub>] [~~che descrizione~~ aiuterebbe Gianni<sub>i</sub> a passare l'esame]]

In the same vein, Safir (1999) provides example (75), in which the anaphor *himself* cannot be directly bound by its intended antecedent (*the rock star*), either in its surface position or in the reconstructed position. In neither position are *the rock star* and *himself* in a local configuration, because another potential binder intervenes (*his wife, she*). Even cases like (75) call for the presence of PRO in the relevant NP.

- (75) The rock star said that his wife would not identify which pictures of himself she had defiantly sent to the tabloids.  
(Safir 1999:595)

If Bianchi (2000) and Cecchetto (2006) are right in pointing out the complicating factor introduced by the presence of PRO, the alleged cases of reconstruction in relative clauses based on Condition A are not reliable, because they involve nouns like *picture*, which in principle can take an NP-internal subject PRO. Therefore, a large part of the literature on this topic rests on a shaky foundation.

Before leaving reconstruction effects, we need to discuss a final case. Bhatt (2002) points out that sentences like (76) and (77) are ambiguous. The DP in (76) ‘has a reading where what John said can be paraphrased as ‘X is the only book that Tolstoy wrote’. This is the ‘low’ reading. It also has a ‘high’ reading, which can be paraphrased as ‘X is the only book about which John said that Tolstoy had written X’’ (Bhatt 2002:57). A similar ambiguity arises in (77).

- (76) the only book that John said that Tolstoy had written  
(Bhatt 2002:57)
- (77) the first book that John said that Tolstoy had written  
(Bhatt 2002:57)

Bhatt interprets the presence of the low reading in (76) and (77) as evidence that the modifier (*only/first*) can reconstruct. This would indirectly show that it is not late-merged but has been raised to its position together with the head noun *book*. If Bhatt’s interpretation is right, the HEAD-raising analysis is seriously challenged, since the phrase *only book/first book* cannot relabel the structure under the Probing Algorithm (3).

However, there is some reason to question Bhatt’s account of the ambiguity of (76) and (77), since the equivalent of the low reading that Bhatt describes holds also in (78a), where no modifier is present. To see this, consider (78a) in a scenario in which Mary gave birth to twins yesterday, but John incorrectly said that Mary had a single baby. Given this scenario, a possible continuation of (78a) is (78b).

- (78) a. The baby that John said that Mary has given birth to . . .  
 b. . . . must have been cloned.

In the reading that makes the continuation in (78b) possible, it is John (and not the speaker) who takes responsibility for the appropriateness of the singular form *baby*. Presumably the speaker is first using John's words to report the facts and then is distancing himself or herself from those words somewhat ironically in the continuation in (78b). In the same vein, when (76) and (77) receive what Bhatt calls the low reading, it is John (and not the speaker) who takes responsibility for the appropriateness of the modifier *only/first*. We conjecture that in all three cases the relevant reading may be explained as a case of scare quotes, although we must leave to future research the task of developing a precise semantic account for this phenomenon. Adopting a scare quote analysis would allow us to avoid assuming reconstruction of the modifier in (76) and (77).

In this section, we discussed reconstruction effects in relative clauses. After pointing out a pair of sentences that strongly support the HEAD-raising analysis, (69)–(70), we discussed murkier cases and showed the factors that complicate them. All in all, although the pattern is quite complex, the distribution of reconstruction effects supports our approach.<sup>9</sup>

### 7.3 Syntax-Semantics Mapping

All the evidence discussed so far indicates that so-called arguments of the noun behave like adjuncts in various respects and can be late-merged when this is necessary (i.e., in case of relativization). Still, the evidence was based mainly on syntactic considerations, so we need to ask if this proposal is semantically feasible as well. In fact, no major problem arises if complements are treated as adjuncts in the semantic component.

For concreteness, take a semantic framework like the one described by Heim and Kratzer (1998). In that framework, nouns, like verbs, can be either transitive (of type  $\langle e, \langle e, t \rangle \rangle$ ) or intransitive (of type  $\langle e, t \rangle$ ). However, since transitive nouns do not always require arguments, it must be assumed that they are lexically ambiguous; they are of type  $\langle e, \langle e, t \rangle \rangle$  when they take an argument

<sup>9</sup> A reviewer asks about scope reconstruction in sentences like (i).

- (i) Two students that each professor has recommended will receive a stipend.

According to this reviewer, (i) "is fairly acceptable with *each* scoping over *two*." We believe that judgments about scope reconstruction are quite complex and depend on various factors, including the equative/predicative character of the main sentence (for more complete discussion, see Cecchetto 2006). Be that as it may, even assuming that scope reconstruction holds in (i), this would be no challenge to the HEAD-raising analysis. In fact, it is possible that under the relevant reading of (i), *two* is interpreted as a modifier of (and late-merged with) the noun *students*, rather than being the external determiner. If so, *each* can undergo Quantifier Raising and take scope over *two* without escaping the boundary of the complex NP. That this analysis is on the right track is confirmed by the fact that the inverse scope reading is impossible in (ii). This is expected under any version of the raising analysis that takes the determiner to be externally merged. In cases like (ii), in order for *each* to take wide scope, it should move by Quantifier Raising out of the complex NP island. So, the inverse scope reading does not arise.

- (ii) The two students that each professor has recommended will receive a stipend.

(*The picture of John (is nice)*) and of type  $\langle e, t \rangle$  when they do not (*The picture in the drawer (is nice)*). Furthermore, in this approach the preposition *of* in the PP *of John* and the preposition *in* in the PP *in the drawer* are taken to be semantically very different, although they belong to the same syntactic category. The former preposition would be semantically vacuous; it would not change the semantic type of the DP *John* (namely,  $\langle e \rangle$ ), with which it combines. So, *of John* would denote an entity of type  $\langle e \rangle$ , which would become the argument of the noun *picture*, which in this structure would be of type  $\langle e, \langle e, t \rangle \rangle$ . The resulting expression *picture of John* has the desired type  $\langle e, t \rangle$ .

On the other hand, *in* would contribute to the semantics of a PP like *in the drawer*, since it is a transitive preposition—namely, it has the type  $\langle e, \langle e, t \rangle \rangle$ . When it combines with *the drawer*, the resulting PP has the semantic type  $\langle e, t \rangle$  (assuming that the definite description is of type  $\langle e \rangle$ ). This PP is further combined with the intransitive noun *picture* by predicate modification, and the resulting expression *picture in the drawer* has the desired type  $\langle e, t \rangle$ .

In this approach, not only must transitive nouns like *picture* be treated as lexically ambiguous, but the syntactic category of prepositions does not have a uniform semantic mapping, since some PPs denote individuals and others denote sets.

One alternative is to assume that all PPs denote sets, which intersect with the set denoted by the noun. In this approach, the NP *picture of John* would be given the same treatment as the NP *picture in the drawer*. Technically, this is feasible and even desirable, since it would allow us to avoid a systematic ambiguity for the category of nouns; they would all be of type  $\langle e, t \rangle$ . Furthermore, all prepositions would play a semantic role, and this would further diminish the gap between syntax and semantics, since there would be a uniform mapping between the syntactic category of preposition and the semantic type  $\langle e, \langle e, t \rangle \rangle$ .

So, treating “complements” of nouns as adjuncts, far from introducing a problem for their semantic interpretation, would simplify the syntax-semantics interface. The only price to pay is that the semantics-pragmatics interface might become more complex. While the semantic content of a preposition like *in* is easily defined in spatial terms, the semantic contribution of the preposition *of* is admittedly vaguer. What *of John* means should be determined contextually, utterance after utterance. For example, *picture of John* might be used to refer to the set of pictures that portray John or that John considered buying yesterday or thought about while taking a shower or is holding in his hands now. However, this complication of the semantics-pragmatics interface is unavoidable for all those cases in which a PP does not correspond to the internal argument of the noun. Therefore, our proposal does not complicate the picture in any significant way.

## 8 The Trigger of Movement in Relative Constructions

Our account is not complete without a brief reflection on what exactly triggers the instances of relabeling movement we are discussing here, since we will have to make some assumptions that depart sharply from standard hypotheses about how movement is derived. These considerations on the trigger of movement in relative clauses will then allow us to extend the HEAD-raising analysis to other types of relative constructions.

As for free relatives, no real issue arises given our account: since free relatives involve the movement of *wh*-elements, which are independently known to be movable, nothing special needs to be said. Whatever mechanism forces *wh*-movement in questions is also responsible for *wh*-movement in free relatives: in terms of Agree, there will be a probe C with a *wh*-feature to be valued, searching for and attracting a *wh*-goal in its c-commanding space. Let us stress this: our proposal is that free relatives and indirect questions have the same derivation and that differences between them should all be reduced to the projecting property of lexical items. In fact, free relatives and questions pattern alike in many respects. For example, parallel to sentences with multiple interrogatives are sentences with multiple free relatives. In (79), the two bracketed free relatives occur in the same clause (one even contains the other).

(79) I finally read [what you wrote about [what I claimed in that article]].

Interestingly, our account can also explain why free relatives and interrogatives differ, when they do. For example, to the best of our knowledge, while there are in-situ interrogatives, there are no in-situ free relatives (see Caponigro 2003 for a survey of free relatives crosslinguistically). Our approach can straightforwardly explain why sentences like (80) are sharply ungrammatical.

(80) \*I will buy [you like what].

The verb *buy* in (80) needs to select a DP but, if *what* remains in situ, the category with which *buy* merges is not of the right kind (it is a TP, not a DP). Note that LF movement of *what* cannot help, under the standard assumption that selectional requirement must be checked cyclically. So, the nonexistence of in-situ free relatives is just a consequence of the projecting nature of the *wh*-word.<sup>10</sup>

Let us now consider the trigger of the relabeling movement in the case of full relatives. In the HEAD-raising analysis (but, *mutatis mutandis*, the same holds for other types of raising analysis), an important question arises. What is the trigger of the movement, given that the ‘head’ N has no specific morphological marker (it is not *wh*-)? This problem clearly arises for *that*-relatives, where the head moves directly from its base position to the edge of the clause, as in (81a), but it affects *wh*-relatives as well. In deriving *wh*-relatives, there is a step where the head moves out of the *wh*-phrase and merges with the root, for which no *wh*-trigger can be identified; see (81b).

<sup>10</sup> Rizzi (1982) points out another difference between indirect questions and free relatives: in languages like Italian, a relative pronoun can be extracted from the former but not from the latter.

- (i) Maria, a cui       so    chi ha telefonato . . .  
       Maria to whom (I) know who has phoned
- (ii) \*Maria, a cui       ho    punito   chi ha telefonato . . .  
       Maria to whom (I) have punished who has phoned

(i) sharply differs from (ii), which violates the Complex NP Constraint. Whatever the Complex NP Constraint ultimately derives from, it is only natural to think that the source of the contrast between (i) and (ii) is a difference in label, and that a clause turned into a nominal category triggers a Complex NP Constraint violation. Therefore, in principle this difference can be reduced to the projecting property of lexical items involved in the derivation.

- (81) a. the [man [that [I met ~~man~~]]]  
 b. the [man [[who ~~man~~] [I met [~~who-man~~]]]]

As we have shown, this operation provides an external determiner with an object satisfying its selectional requirements (through relabeling). It is very tempting to argue that this is indeed the trigger of the operation itself. How can we reach this conclusion without introducing unwanted lookahead into the computation, or an anticyclic operation?

Consider the notion of selection and its role in the computation: in most standard views, selection is responsible for any structure-building operation.<sup>11</sup> In contrast with standard Agree relations, selection involves an element still located in the numeration and a syntactic object already formed in the computational space. If we want to adhere to a strict minimalist thesis and assume that selection is a type of probe-goal relation, this amounts to saying that an element in the numeration can probe an element in the computation and trigger external Merge (see Rizzi 2008 for a similar view). To illustrate, in (82) the verb *think* in the numeration probes for the syntactic object *that Mary will leave*. As a result, the two merge, as in (83).

- (82) {think<sub>C</sub>, . . . }  
 [C that Mary will leave]

- (83) [think<sub>C</sub> [C that Mary will leave]]

Under the minimalist assumption that Move is just an instance of Merge, the null hypothesis is that the same mechanism can also trigger internal Merge: in (84), for example, a D in the numeration can act as a probe, searching for an appropriate N-goal to merge with. Suppose it finds an appropriate goal in the N-feature present within the syntactic object [*that man will come*].

- (84) {the<sub>N</sub>, . . . }  
 [that [N man] will come]

Direct merging of *the* with *man* in the base position of the noun would violate the No Tampering Condition. As an alternative, the probe D (still in the numeration) triggers internal Merge of the N, which can turn the root into an appropriate syntactic object with which D can merge; see (85).

- (85) the<sub>N</sub> [N man that ~~man~~ will come]

More generally, it seems reasonable to assume that a lexical item still in the numeration can directly trigger a movement operation insofar as this movement creates the proper syntactic object that satisfies the selection requirements of the lexical item. Let's call this movement *selection-driven movement* (see Vergnaud 1985 for a similar idea in a different framework).

Issues concerning triggers are important but intricate, and the predictions of a proposal like this, directly linking head movement to selection, need to be closely scrutinized. However, we want to stress that, since in our system only head movement has the property of relabeling its

<sup>11</sup> With the exception of those involving adjuncts, which are by definition not selected: see Hornstein 2009 and Cecchetto and Donati 2010 for two distinct proposals on adjunction and a (tentative) derivation of adjunct islandhood.

target, we predict that only head movement can be selection driven. This means that allowing this option does not run the risk of overgenerating.

A natural extension would be to verify whether selection-driven movement is at play in other types of head movement (say, V-movement or T-movement). Although this is not the place to elaborate a full-fledged theory of selection-driven movement, we can observe that our approach fits nicely with a certain proposal concerning canonical cases of head movement: Surányi's (2005) "head movement qua root merger" theory.<sup>12</sup> We leave this important reflection for a different context, instead focusing here on some consequences of this approach for the understanding of relative clause constructions of different kinds.

Notice first of all that claiming that N-movement in relative clauses is directly triggered by external selection means divorcing this operation from the realm of the complementizer: contrary to what happens in *wh*-movements, where C is both the locus and the probe of the operation, here the left edge of the clause is involved only because it is the root and not because of its feature specification. A well-known fact might be interpreted as direct evidence of this divorce. In many languages, *wh*-elements in Spec,CP are incompatible with an overt complementizer (owing to the Doubly Filled Comp Filter; Chomsky and Lasnik 1977).

- (86) a. \*I wonder who if will come.  
 b. \*the man who that you know

Although the exact nature of this phenomenon is still unknown, it testifies to the strict relation between the feature specification of the complementizer and that of the element it merges with in *wh*-movement constructions. As is well known, however, no such effect holds between the head of a relative clause and the complementizer, in any language.

- (87) the man (that) you know

Traditionally, this is explained by proponents of the raising analysis (see, e.g., Bianchi 1999) by claiming that relative "heads" and *wh*-elements move into two different landing sites in the Comp area. The approach assumed here provides a simpler explanation. The landing site of the two instances of movement may be the same (the edge of the clause), but the trigger differs: in *wh*-movement, C is involved as the trigger, and this affects its realization (Doubly Filled Comp Filter effect); when the relative head moves, C is not involved (because the trigger is external selection), and the movement has no effect on the realization of C (no Doubly Filled Comp Filter effect).

If the movement of the relative head is directly triggered by the selection features of an external element, we expect selection-driven movement to hold in contexts other than full relatives; that is, the external selector might not be D but some other category. For example, we expect

<sup>12</sup> Biberauer, Holmberg, and Roberts (2009) observe that, given minimalist assumptions on Agree and Merge, the *absence* of selection-driven movement should be stipulated. However, they do not restrict selection-driven movement to head movement the way we do, with interesting consequences.

there to exist structures similar to free relatives, where the raising head of the clause is a D selected by, say, an external V, but no *wh*-feature is involved. Romance pseudorelatives, we argue, are a case in point. In the next section, we look more closely at this construction and show how the HEAD-raising analysis can be extended to it.

## 9 Pseudorelatives and Locality

Pseudorelatives in Romance are adnominal clauses typically embedded under (certain) verbs of perception, which only superficially resemble relative clauses (Guasti 1988, Cinque 1995). One clear pseudorelative example is (88). Here, the relative structure is distinguished from a restrictive relative since it ‘modifies’ a pronoun. It is not an appositive relative clause either, since it lacks the specific prosodic contour of appositives and has a different meaning.

- (88) Ho incontrato lui che baciava Maria.  
 (I) have met him that kissed Maria  
 ‘I met him while he was kissing Maria.’

Another property sets pseudorelatives apart from genuine relatives: as (89) shows, they can only be subject relatives.

- (89) \*Ho incontrato lui che Maria baciava.  
 (I) have met him that Maria kissed  
 ‘I met him while Maria was kissing him.’

In our analysis, pseudorelatives are just another case of selection-driven movement, much like ordinary relatives, but with a crucial difference. While in ordinary relatives the relabeling movement is movement of a noun, in pseudorelatives like (88) the relabeling movement is movement of a determiner. In (88), the matrix verb *incontrato* ‘met’ needs to be merged with a DP. It finds an appropriate goal in the D-feature of *lui* within the syntactic object [*che lui baciava Maria*] (see (90)). However, direct merging of *incontrato* with *lui* would violate the No Tampering Condition. So, *incontrato* (still in the numeration) triggers internal Merge of D, which can turn the root into an appropriate syntactic object, with which V can merge; see (91).

- (90) {*incontrato*<sub>D</sub>, . . . }  
 [<sub>C</sub> *che lui baciava Maria*]  
 (91) *incontrato*<sub>B</sub> [<sub>D</sub> *lui che lui baciava Maria*]

The representation in (92) illustrates the labeling output. Under the Probing Algorithm (3), D, by virtue of being a lexical item, can transmit its label.<sup>13</sup>

<sup>13</sup> Our approach is not compatible with a literal interpretation of Cardinaletti and Starke’s (1999) proposal that strong pronouns like *lui* ‘him’ project a full DP while clitics and weak pronouns have a more impoverished syntactic structure. Note that Cardinaletti and Starke’s approach is fully natural assuming X-bar theory apparatus but is at odds with bare phrase structure, where the concept of maximal projection (XP) is not even a primitive. Still, the differences described by Cardinaletti and Starke are real, so they should be captured in the new framework. This is not the place to do that, though.

- (92) [<sub>D</sub> lui [<sub>C</sub> che [<sub>T</sub>[<sub>D</sub> lui] baciava Maria]]  
 him that kissed Maria

This analysis amounts to making pseudorelatives also very similar to free relatives: in both cases, what moves is a determiner-like head, as opposed to full relatives, where what moves is an N head. There is, however, an important difference: recall that in free relatives, the probe of the operation is a C attracting a *wh*-goal. As a result (as we discussed in detail in section 3), a labeling conflict arises (C is the probe of the operation, but the *wh*-element is a probe too by virtue of being a lexical item) and free relatives are systematically ambiguous. On the other hand, this ambiguity does not hold for pseudorelatives, and for a good reason: here, C is not involved in the raising of the head, which is directly driven by selection. As a result, C is not a probe and no conflict arises, hence no ambiguity: pseudorelatives are never allowed to be embedded under a verb selecting for a CP.<sup>14</sup>

- (93) \*Ho saputo lui che baciava Maria.  
 (I) have known him that kissed Maria

The fact that pseudorelatives are restricted to subjects can also be derived under our account, in the following way. In pseudorelatives, any subject intervenes and blocks object raising because the feature attracted is D, and a determiner in subject position c-commands the goal in object position; see (94).

- (94) \*<sub>[D/C]</sub> lui [<sub>C</sub> che [<sub>T</sub>[<sub>D</sub> la studentessa/Maria] baciava [<sub>D</sub> lui]]]  
 him that the student/Maria kissed

Note that our account can also explain why a similar intervention effect does not arise in free relatives and in ordinary relatives. Plain subjects do not intervene in free relatives because what moves is a *wh*-D head, attracted by a *wh*-C, and a plain D does not act as a proper intervener; only a *wh*-D subject does, as shown in (95).<sup>15</sup>

<sup>14</sup> The conclusion that pseudorelatives are always of category D should not be undermined by the compatibility of pseudorelatives with event proforms, such as *un fatto* ‘a fact’ or *ciò che* ‘what that’, as illustrated in (i).

- (i) a. Ho visto lui che baciava Maria, un fatto molto curioso.  
 (I) have seen him that kissed Maria a fact very curious  
 ‘I saw him kissing Maria, a very curious fact.’  
 b. Ciò che ho visto è lui che baciava Maria.  
 what that (I) have seen is him that kissed Maria  
 ‘What I saw was him kissing Maria.’

These proforms say something about the *interpretation* of pseudorelatives, which can have both an individual and an event reading, but do not say anything about their syntactic category, which is always D. That these proforms are not syntactic but semantic tests is confirmed by (ii), where they are shown to be compatible with a DP insofar as it has an event interpretation.

- (ii) a. Ho sentito l’esplosione delle torri, un fatto sconvolgente.  
 (I) have heard the explosion of.the towers a fact shocking  
 ‘I heard the explosion of the towers, a shocking fact.’  
 b. Ciò che ho sentito è l’esplosione delle torri.  
 what that (I) have heard is the explosion of.the towers  
 ‘What I heard was the explosion of the towers.’

<sup>15</sup> *Mutatis mutandis*, the same holds for topicalization. Typically, an object can be topicalized over a subject. The absence of an intervention effect can be explained if the object has a topic-like feature that the subject lacks.

- (95) a. I will read what I know that you read.  
 b. \*I will read what I wonder who reads.

As for full relatives, recall that we have assumed that movement of the ‘head’ is dissociated from C and *wh*-features and that, at least in its final step, it is directly triggered by external selection (section 8), just as in pseudorelatives. However, the reason why full relative clauses are not restricted to subject positions becomes apparent if we consider that in full relatives what moves is an N head (selected by an externally merged determiner), not a D head; see (96). While a D in subject position c-commands a D in object position acting as an intervener for a D-chain, this does not hold for a noun in subject position, which, being embedded under a determiner, does not c-command anything in the clausal spine and does not technically intervene.

- (96) il [N ragazzo [C che [D la [N studentessa]] baciava [D e [N ragazzo]]]]  
 the boy that the student kissed

Pseudorelatives are possible with proper names, as well.

- (97) Ho incontrato Gianni che baciava Maria.  
 (I) have met Gianni that kissed Maria  
 ‘I met Gianni while he was kissing Maria.’

This is not surprising, since proper names and pronouns have a similar distribution and freely occur in argument positions. We assume that the derivation of a pseudorelative like (97) is identical in the relevant respect to the derivation of (92): namely, *Gianni* moves alone and relabels the structure by virtue of being a lexical item.<sup>16</sup>

<sup>16</sup> One might think that the head of a pseudorelative is not restricted to being a proper noun or pronoun, contrary to what is claimed in the text. As shown by its two English translations, (i), in addition to receiving a restrictive relative reading, receives a temporal reading, akin to the one found in pseudorelatives.

- (i) Ho visto il ragazzo che partiva.  
 (I) have seen the boy that was.leaving  
 ‘I saw the boy who was leaving.’  
 ‘I saw the boy while he was leaving.’

However, as Cinque (1995) correctly points out, the impression that (i) is a pseudorelative is due to the interference of an independent adverbial construction. Consider (ii).

- (ii) Ho visto Gianni che partiva.  
 (I) have seen Gianni that was.leaving

(ii) is ambiguous between (a) a pseudorelative structure (and interpretation) and (b) a structure where the NP is the object of the perception verb and the CP is a temporal adverbial clause with a null subject, with a meaning basically corresponding to a ‘while’-clause. This ambiguity can be resolved by inserting a lexical subject in the adverbial clause, as in (iii). To make the use of a lexical subject fully natural, in (iii) the pronoun is modified by *anche* ‘also’.

- (iii) Ho visto Gianni che anche lui partiva.  
 (I) have seen Gianni that also him was.leaving  
 ‘I saw Gianni, while he was leaving as well.’

Clearly, (iii) is not a pseudorelative, since it contains no gap. Another test disentangling a pseudorelative from the adverbial construction is fronting: in a pseudorelative, but not in the adverbial construction, the noun and the clause form a constituent that can be fronted, as in (iv). That (iv) is not compatible with the adverbial construction is shown by the impossibility of inserting a lexical subject.

In this section, we have shown that selection-driven movement, as expected, occurs also with a selector different from *D* (the selector in full relatives). When a verb triggers a relabeling movement of *D*, a pseudorelative structure emerges. We could explain the puzzling fact that only subject pseudorelatives are allowed as a locality effect, under the standard assumption that Relativized Minimality effects arise only if the intervener *c*-commands the goal.

Notice that the approach to locality and relativization presented here has certain consequences worth exploring. From a crosslinguistic perspective, our analysis makes very strong predictions about relativization in genuinely determinerless languages: if relativization involves raising of a noun, object ‘that’-relatives are predicted to be problematic in those languages in which a subject noun is not embedded under a DP layer and thus acts as an intervener. Polish might be a good example: it lacks determiners, and it indeed displays an interesting asymmetry between object and subject relatives (Szczegielniak 2004). While subject ‘that’-relatives are fine, genuine object ‘that’-relatives are not allowed, and (some kind of) *wh*-relativization strategy is compulsory.

From an acquisition perspective, the account discussed here might provide the key to explaining a well-known puzzle concerning the development of relative structures in first language acquisition: the systematic and dramatic time gap between the development of subject relatives (around age 3) and that of object relatives (around age 8). See Cecchetto, Donati, and Guasti 2011 for a first proposal in this direction.<sup>17</sup>

## 10 Conclusion

Although relative constructions have been systematically investigated for over 40 years in the generative tradition, the debate over their correct analysis is still very much open. The raising analysis (e.g., Kayne 1994, Bianchi 1999) in particular has many merits, the first being that it gives a simple explanation for the pivotal nature of the relative ‘head,’ acting as a constituent

- 
- (iv) GIANNI CHE (\*ANCHE LUI) PARTIVA ho visto.  
Gianni that also him was.leaving (I) have seen

With this in mind, we can go back to (i) and show, by fronting the noun and the clause, that it is not a pseudorelative.

- (v) IL RAGAZZO CHE PARTIVA ho visto.  
the boy that was.leaving (I) have seen  
‘The boy who was leaving, I saw.’

Here, the structure is disambiguated: the only reading available is the restrictive one, while the reading that looked like a pseudorelative in (i) disappears. This shows that that reading was indeed due to the adverbial structure, here excluded because of its incompatibility with fronting.

Interestingly, epithets seem to behave like definite descriptions and unlike proper names. While (vi) is ambiguous between a restrictive reading and a temporal reading, in (vii) only the restrictive reading survives.

- (vi) Ho visto il cretino che faceva casino.  
(I) have seen the idiot that made trouble  
‘I saw the idiot who was making trouble.’  
‘I saw the idiot while he was making trouble.’

- (vii) IL CRETINO CHE FACEVA CASINO ho visto.

<sup>17</sup> Subject (full) relatives are also more frequent crosslinguistically. See Keenan and Comrie’s (1977) accessibility hierarchy of relativization: Subject > Direct Object > Indirect Object > Oblique > Genitive > Object of comparative.

both of the relative clause and of the matrix clause: the two positions are simply related by movement. We believe, however, that the raising analysis suffers from drawbacks that all trace back to an incomplete understanding of the nature, the properties, and the trigger of this movement operation. In this article, we proposed a slight modification of the raising analysis that led us to bypass the limits of the standard analysis and allowed us to extend its approach to constructions related to relative clauses but poorly understood: free relatives and pseudorelatives.

We started from a specific approach to phrase structure theory (Cecchetto and Donati 2010), where a lexical item can transmit its label when it is merged with another category, both when it is externally merged and when it is internally merged (i.e., moved). This means that there is a type of movement, head movement, which has the property of relabeling the structure it merges with. Analyzing the raising of the relative ‘head’ in different types of relativization structures as an instance of this relabeling head movement, we clarified the trigger of the movement, its relation to *wh*-movement, its case-related properties, and its locality restrictions.

This new approach led to a radical revision of some standard assumptions of the current theory, such as the difference between adjuncts and complements in the nominal domain, and the relation between selection and movement. We hope the conclusions reached here may be a stepping stone toward further research in these different directions.

### Appendix: *-Ever-Relatives and Other Relatives That Look Free but Are Not*

There are a number of constructions in English and in many other languages that superficially look like free relatives but diverge from them in crucial aspects. We deal here with some of them, focusing in particular on those constructions that look like counterexamples for the approach to relativization presented in this article.

*-Ever-relatives* are the first case in point, illustrated in (98).

(98) I shall visit whatever town you will visit.

What is interesting about (98) is that it looks like a free relative (the embedded clause is opened by a *wh*-element, and no separate nominal head is present), but it seems to involve phrasal movement of *whatever town*, instead of the head movement predicted to be the only possibility in relativization, given our account.

*-Ever-relatives* are found in a variety of languages, but Italian is especially revealing in this respect. In an insightful but neglected article, Battye (1989) explicitly considers whether the counterpart of *-ever-relatives* can be on a par with free relatives. In the end, he denies this, coining the term *pseudo free relatives* for the former type. He identifies several differences between genuine free relatives and pseudo free relatives. We discuss five of them here.

The Italian counterpart of the *-ever* suffix is *-unque*. Since *-unque-relatives* with the *wh*-word *quanto* are not attested in Italian (nor are free relatives with *quale*), in the following examples (adapted from Battye 1989) free relatives with *quanto* (lit. ‘how much’) are contrasted with pseudo free relatives with *qualunque* (lit. ‘whichever’).

*Property (i)*. *-Unque*-items can have an absolute use; that is, they do not need to appear in a relativization structure. Ordinary free relatives (by definition) cannot have an absolute use.

- (99) E' un argomento di tesi che avrei proposto a qualunque studente /  
 is a topic of thesis that (I) have.COND proposed to whichever student /  
 \*quanti (studenti).  
 \*what (students)  
 'This is a dissertation topic I would have proposed to any student.'

*Property (ii).* -*Unque*-items can occur with the complementizer that occurs in full relatives. Ordinary free relatives cannot.

- (100) qualunque costituente che venga spostato in Comp  
 whichever constituent that is.SUBJ moved to Comp  
 'whichever constituent is moved to Comp'  
 (101) \*quanto che venga spostato in Comp / \*quanti che vengano spostati in Comp  
 what that is.SUBJ moved to Comp / what.PL that are.SUBJ moved to Comp

*Property (iii).* -*Unque*-items can cooccur with a relative pronoun. Ordinary free relatives cannot.

- (102) Qualunque ragazzo a cui parlo mi dice la stessa cosa.  
 whichever boy to whom (I) speak me.CL tells the same thing  
 'Whichever boy I speak to tells me the same thing.'  
 (103) \*Quanti a cui parlo mi dicono la stessa cosa.  
 what.PL to whom (I) speak me.CL tell the same thing

*Property (iv).* -*Unque*-items have an adverbial use. Ordinary free relatives do not.

- (104) Hai fatto un errore, qualunque motivo ti abbia spinto.  
 (you) have made a mistake whichever reason you.CL has.SUBJ pushed  
 'You made a mistake, whichever reason pushed you.'  
 (105) \*Hai fatto un errore, quanti (motivi) ti abbiano spinto.  
 (you) have made a mistake what reasons you.CL have.SUBJ pushed

*Property (v).* -*Unque*-items do not appear in infinitival complements. Ordinary free relatives do.

- (106) \*Cerco qualunque studente mandare al mio posto.  
 (I) search whichever student send.INF in my place  
 (107) ?Cerco quanti mandare al mio posto.  
 (I) search what.PL send.INF in my place  
 'I search for someone to send in my place.'

These five properties clearly distinguish normal free relatives and pseudo free relatives of the *-ever* type. A natural hypothesis is that the lexical operation that adds the *-unque/-ever* suffix to the *wh*-word inactivates its *wh*-feature, turning the *wh*-determiner into an ordinary quantificational one. This explains why *whatever*-phrases cannot appear in indirect questions.

- (108) Mi domando quale/\*qualunque è arrivato.  
 me.CL (I) wonder which/whichever is arrived  
 ‘I wonder which one/\*whichever arrived.’

- (109) I wonder what/\*whatever happened.

Furthermore, if the *-unque*-phrase is an ordinary quantificational DP, it is expected that although modification by a relative clause is possible (as with other quantificational DPs), it is not required. This explains the absolute use (property (i)) of *-unque*-phrases in Italian. In fact, even in English, although most informants find a sentence like *I might suggest whatever topic for his dissertation* less than felicitous, examples of absolute uses are attested. The following is just one example from a random Google search:

- (110) I don't know what price range you are building in, but an architect can help you maximize your square footage or features of whatever house for your budget.

Properties (ii) and (iii) are easily explained in the same vein. If *-unque*-items are ordinary quantificational DPs, we expect them to occur in ordinary relative clauses—that is, to cooccur with a complementizer and with a relative pronoun.

Recall that full relative clauses are crucially characterized by being selected by an external determiner and that what moves is only the bare determinerless ‘head’ of the relative clause. In *-ever*-relatives, we assume, the *-ever/-unque*-determiner is such an external determiner, and the ‘head’ of the relative is the nominal part of what ends up not being a constituent at all.

- (111) I will visit whatever [<sub>CP</sub>[<sub>NP</sub> town] (that) [<sub>IP</sub> you will visit ~~town~~]].

Prescriptive grammars of English strongly disfavor using *whatever*-phrases with an overt complementizer—but this prohibition testifies that speakers in fact use this form. Not surprisingly, examples are attested, as the following sentence resulting from another random Google search shows:

- (112) Consider that the value of whatever house that stands on any lot is derived in large part from the perceived value of other, comparable houses in the neighborhood.

Going back to Italian, notice that *-unque*-relatives are fully felicitous only in the subjunctive. Interestingly, the subjunctive mood typically licenses the dropping of the complementizer in Italian, as illustrated in (113).

- (113) a. Credo \*(che) parte domani.  
 (I) believe \*(that) (he) leave.3SG.IND tomorrow  
 ‘I believe that he leaves tomorrow.’  
 b. Credo (che) parta domani.  
 (I) believe (that) (he) leave.3SG.SUBJ tomorrow

It is thus legitimate to interpret the obligatoriness of the subjunctive as evidence that the complementizer *che* is indeed always there in *-unque*-relatives, and superficially dropped in most cases.

As for property (iv), it is shared by English and Italian, as shown by (114).

(114) Whatever/\*What happens, I am not here.

As Dayal (1997) notes, the possibility of an adverbial use for free relatives with *-ever* (unlike free relatives, which are totally infelicitous in the same context) relates to the quantificational nature of *-ever*-determiners.

Property (v) is also shared by English and Italian, as confirmed by the pair (115a) and (115b).

- (115) a. I found out what to read.  
 b. \*I found out whatever (book) to read.

If *-ever/-unque*-structures are quantificational DPs, as we have proposed, the ungrammaticality of (115b) is expected, since quantificational DPs (and overt DPs in general) cannot appear in this type of structure.

(116) \*I found out every book to read.

The grammaticality of a structure like (115a), and its Italian counterpart, is equally expected under our approach. In fact, *what* occupies a position in the CP area in (115a) and, as always in free relatives, a labeling conflict arises. One possible labeling output is that C transmits its label and *what to read* becomes a CP, which is selected by *find out* (cf. *I found out that reading is dangerous*).

To summarize: Five properties clearly distinguish ordinary free relatives and pseudo free relatives in Italian. Moreover, some of them clearly hold for English, suggesting that the analysis for Italian can be extended to English. The properties strongly suggest that pseudo free relatives are ordinary quantificational DPs and therefore must receive an analysis different from the one advanced for ordinary free relatives. Crucially, the idea that a labeling conflict arises when a lexical item is merged with a complex syntactic object is *not* falsified by the existence of pseudo free relatives. On the contrary, as just shown, this idea can explain the systematic differences between pseudo free relatives and ordinary free relatives quite directly.

We also assume that the same approach to pseudo free relatives can extend to other “maximizing relatives” (Grosu 2002) like (117), whose interpretation strongly suggests the presence of a silent *-ever*-type determiner.

(117) I will read what books you will tell me.

There is one final class of relative constructions that is worth discussing briefly here. We illustrate again with Italian.

- (118) Leggerò quello che mi                    dirai    di leggere.  
 (I) read.FUT that    that me.CL (you) tell.FUT to read  
 ‘I will read what you will tell me to read.’

What is interesting about (118) is that it seems to be the equivalent of a *what*-free relative in English, as shown by the translation provided. The difference is that no *wh*-element opens the embedded clause here; rather, it starts with a demonstrative element (*quello*), followed by the complementizer that introduces full relatives. A reviewer wonders whether we might analyze this

as a free relative or not. This is important because if these structures happened to share the relevant properties, a natural and maybe simpler alternative to our analysis would be to assume that free relatives are just like (118) but with a silent determiner.

An English variant of (118) is the marginal and archaic but attested (119).<sup>18</sup>

(119) That which we call a rose / By any other name would smell as sweet.  
(*Romeo and Juliet* II, ii, 1–2)

There are several properties that clearly set these structures apart from free relatives and discourage a unified account.

First, the demonstrative here is clearly externally merged and not raising from within the relative clause. This is transparent in the English construction, where two determiners cooccur (*that* and *which* in (119)); but the same kind of evidence emerges in Italian, as illustrated in (120).

(120) Ti            insegnerò quello in cui            credo.  
          you.CL (I) teach.FUT what    in which (I) believe  
          ‘I will teach you what I believe in.’

This means that these structures are very different from free relatives, and much more similar to full relatives: they are introduced by a determiner; they might or might not involve *wh*-movement (at least in Italian, as in (118), a simple ‘that’-clause is possible); and arguably they involve the raising of some generic null noun.

Second, they are not ambiguous as free relatives are: as (121) shows, they are incompatible with a context selecting for indirect questions.

(121) \*Mi            chiedo quello che mi            dirai    di leggere.  
          me.CL (I) wonder that    that me.CL (you) tell.FUT to read  
          ‘I wonder what you will tell me to read.’

This again suggests that the structure of these sentences is different from that of free relatives (and similar to that of full relatives, notoriously never ambiguous either).

Third, the *wh*-elements that show up in this kind of relative construction are not the *wh*-elements that occur in free relatives; rather, they are those found in full relatives. In English, *which* is impossible as a free relative (122a), but it typically belongs to the construction illustrated in (119) and in full relatives (122c); *what* is a typical free relative introducer (122a), but it is impossible in this kind of structure (and in full relatives) (122b–c).

(122) a. what/\*which we call a rose  
          b. \*that what we call a rose  
          c. the thing which/\*what we call a rose

<sup>18</sup> Similar data are found in Dutch, which displays a relative construction introduced by *dat wat*, in addition to ‘‘standard’’ free relatives introduced by *wat* only.

The same asymmetry holds in Italian: (*a*) *cui* is impossible in free relatives (123a), but it shows up in (120) and in full relatives (123c); *chi* is a typical free relative introducer (123a), but it is disallowed in this construction (and in full relatives) (123b–c).

- (123) a. Mi           dedicherò   a chi   / \*a cui           voglio bene.  
 me.CL (I) dedicate.FUT to whom / to which (I) care  
 ‘I will dedicate myself to those I care for.’
- b. \*Mi           dedicherò   a quelli a chi           voglio bene.  
 me.CL (I) dedicate.FUT to those to whom (I) care
- c. Mi           dedicherò   alle persone a cui   / \*a chi           voglio bene.  
 me.CL (I) dedicate.FUT to.the people to which / to whom (I) care  
 ‘I will dedicate myself to the people I care for.’

To summarize: It seems very unlikely that these relative constructions and the free relatives analyzed in this article can be reduced to the same underlying structure, in light of their strong syntactic divergences. We can safely maintain that free relatives are only those ambiguous structures where a determiner-like *wh*-element raises to the edge of a clause, optionally relabeling it by virtue of the projecting property of heads, as we hope to have convincingly argued for here.

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