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The Raising Analysis of Relative Clauses: A Reply to Borsley (1996)

1. Introduction

In a recent paper, Borsley (1996) criticizes the raising analysis of relative clauses proposed by Kayne (1994) in the framework of his Antisymmetry theory. Specifically, he argues that the analysis is defective in various respects and requires "... numerous additional mechanisms to achieve observational adequacy". These additional mechanisms strike him as entirely implausible or *ad hoc*; therefore, Borsley concludes that the raising analysis is not viable and, since it is the only approach to relative clauses consistent with the Antisymmetry theory, there must be something wrong with the theory itself.

It should be stressed that though Borsley raises a number of interesting objections, he does not point out any decisive counterexample to the raising analysis. In this paper it will be argued that a refinement of the analysis originally presented by Kayne (1994) provides an answer to the questions raised by Borsley. Since Borsley disregards the comparative perspective which is essential to Kayne's discussion, the present paper too will primarily focus on English data, though some comparative evidence will be presented as it bears on specific points of the argumentation.

2. The syntax of relative determiners

Many of Borsley's objections centre on the status of relative pronouns. In the raising analysis, the relative clause is selected by an external determiner, and the 'head' is a nominal constituent which directly raises from the trace position to Spec,CP, as represented in (1):

(1) $[_{DP}$ the $[_{CP}$ $[\text{picture}]_i$ [that $[_{IP}$ Bill saw t_i]]]]

Kayne proposes that in relative clauses like (1), which lack an overt relative pronoun, the raised nominal constituent does not include a D° head, but it is simply a NP. This does not hold for wh-relatives like (2), featuring an overt relative pronoun:

(2) the picture which Bill saw

For these, Kayne proposes the following derivation: the nominal constituent generated in the trace position is a relative DP $[_{DP}$ which $[_{NP}$ picture]] headed by a relative determiner. This DP moves to Spec,CP, and then the NP category raises to the Spec of the DP itself. The resulting representation is (3):

(3) $[_{DP}$ the $[_{CP}$ $[_{DP}$ $[_{NP}$ picture] $[_{DP}$ which t $]]_i$ $[_{IP}$ Bill saw t_i]]]

Borsley presents numerous criticisms to both (1) and (3); let us consider them in turn.

As for (1), he argues that the assumption of a raised nominal constituent lacking the DP level is untenable. In fact, the constituent is generated in an argument position, and there is wide consensus on the hypothesis that only the DP projection, but not NP, can act as an argument (cf. for instance Stowell 1989 and Longobardi 1994). Empirically, it can be shown that the empty category in (1) acts as a DP trace with respect to a number of tests, e.g. binding, licensing of parasitic gaps, and weak islands.[1]

This objection is sound. Therefore, let us assume that the relative 'head' in (1) is introduced by an empty relative determiner:

(4) $[_{DP}$ the $[_{CP}$ $[_{DP}$ D° picture$]_i$ $[_{CP}$ that Bill saw t_i]]]

[1] Borsley overstates Kayne's assumptions on this point, implying that in structures like (1) the raised category is invariably an NP. Actually, Kayne argues that in an example like (i) the raised 'head' includes some functional projections which accommodate the possessive phrase:
(i) the [two pictures of John's] that you lent me
However, this does not entail that the 'head' always has to be larger than NP.

With respect to this representation, Borsley raises the following questions:
(i) how is the empty determiner licensed?
(ii) why isn't it licensed in non-relative arguments?
(iii) what is the relation between the external determiner and the NP?

Concerning the first question, it is possible to take advantage of a specific aspect of the raising structure (4), namely the fact that the raised relative DP is immediately c-commanded by the external determiner and, given the adjunct status of specifiers, it is only covered by one segment of CP. Under these conditions, the external D° and the empty relative D° turn out to be in a strictly local configuration, and they can establish a licensing relation. Specifically, let us assume that the empty relative D° is licensed through abstract incorporation to the external D°:

(5) $[_{DP}\ D_{REL}$ + the $[_{CP}\ [_{DP}\ t_D$ picture$]_i\ [_{CP}$ that Bill saw $t_i\ ]]]$

The hypothesis that empty morphemes are licensed through incorporation is extensively argued for by Pesetsky (1995). However, for reasons that will become clear in the discussion of section 3, we will propose a somewhat different implementation of this hypothesis.

Suppose that before Spellout the terminal symbols dominated by functional heads are not concrete morphemes, but abstract sets of syntactic features (cf. Halle & Marantz 1993). From this perspective, the incorporation of a functional head F^1 to a host F^2 can be conceived of as an operation that unifies two sets of features. In the Morpho-Phonological branch of the derivation, the complex head F^1+F^2 is spelled out as a single morpheme and, since the trace of the incorporated head is not spelled out, the latter appears to have been deleted.

Note that since the two sets of features F^1 and F^2 have to be unified, they must be consistent with each other. This condition is satisfied in (5): in fact, the external D° and the relative D° both share the phi-features of the NP 'head' *picture*; moreover, let us assume without argument that the relative D° in underspecified with respect to the feature of definiteness.[2] It follows that the two determiners are fully consistent.

This proposal implies that the relative determiner cannot incorporate to just any head, but only to one that shares with it a significant number of features.[3] It follows that the empty determiner cannot be licensed when it is locally related to a lexical head, e.g. a verb, as in (6) (Borsley's (24)):

(6) * Bill liked $[_{DP}\ e\ [_{NP}$ picture$]]$

This provides an answer to the second of Borsley's questions.

The hypothesis of abstract incorporation is strenghtened by the observation that in pied piping contexts the empty determiner is not licensed:

(7) a. the man with whom you're sure to have a good time
b. * the man with (that) you're sure to have a good time (Kayne 1984: 65)

According to Kayne (1994: 89), (7) has the following derivation: the PP [with [whom [man]]] is pied piped to Spec,CP and subsequently, the NP raises to Spec,PP:

(8) $[_{DP}$ the $[_{CP}\ [_{PP}\ [_{NP}$ man$]\ [_{PP}$ with $[_{DP}$ whom t $]]]_i\ [_{CP}$ C° ... t_i ...$]]]$

In this structure, the relative D° is not in a local relation with the external D°, because the preposition intervenes; therefore, its deletion is correctly predicted not to be licensed.

Let us now turn to the third question, concerning the relation between the external determiner and the NP 'head'. It is essential to the raising analysis that these two categories come to be adjacent, so that they look like a constituent. However, Borsley argues, this strictly local relation is not independently justified. It is unclear why the NP 'head' would have to be governed by the external D°, since it is already governed by another D° - the relative one - from the very beginning of the derivation. On the other hand, in Kayne's analysis there are some

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2 See Bianchi (1995: 58-64). On the Case feature see the discussion around (19) below.

3 This recalls the notion of recoverability, whereby the relative pronoun can be deleted because its feature content can be inferred from the antecedent 'head': cf. Chomsky & Lasnik (1977) and Cinque (1982). Recoverability is now reduced to the condition of feature compatibility for incorporation.

relative structures where the NP 'head' does not raise to a position that is governed by the external D°. These are reduced relative clauses, for which Kayne (1994: 97-101) proposes the analysis in (9):

(9) $[_{DP}$ the $[_{CP}$ [t_i yellow$]_j$ [C° $[_{IP}$ [sweater$]_i$ [I° t_j]]]]]

In this structure, what raises to Spec,CP is not the NP 'head', but rather the predicative category headed by the adjective. Borsley concludes that there is no necessary relation between the external D° and the NP 'head', and therefore, an essential step of the raising derivation remains unjustified.

An answer to this objection can be found if we adopt a different perspective on the problem. Borsley apparently interprets Kayne's statement on p. 90 to the effect that the NP 'head' must be licensed under government by the external determiner. However, the reverse interpretation is also possible: namely, it is the external D° that must check some feature(s) against a nominal category, and thus triggers the raising of such a category to the Spec position that it immediately c-commands.

This hypothesis is articulated in two parts. On the one hand, as already mentioned, the external D° is endowed with phi-features, which must plausibly undergo checking. On the other hand, it is clear that, though selecting the relative CP, the external D° is a nominal determiner, which must bind the open position of a noun in LF;[4] in this respect - as Borsley correctly points out - it differs from the 'clausal determiner' introducing an argument clause, as in (10):

(10) $[_{DP}$ l' $[_{CP}$ aver lui affermato ...

The different LF functions of nominal and clausal determiners can be implemented by the assumption that they bear different categorial features to be checked: nominal determiners bear an N-feature, while clausal determiners plausibly bear a C-feature.[5]

In sum, the external determiner of the relative structure is endowed with both phi- and categorial features that must be checked in a local relation with a nominal phrase. Let us now consider how this requirement can be met.

Consider first a simple DP structure like (11):

(11) $[_{DP}$ the $[_{NP}$ picture]]

In this structure, the nominal D° and the NP category are in a head-complement relation, and NP falls in the minimal domain of D°. This configuration allows the required checking relation between the two categories.[6]

Interestingly, the raising relative structures (5) and (8) can be assimilated to (11) in this respect. This can be achieved by adopting the definition of minimal domain proposed by Manzini (1994):

(12) the minimal domain (X) of a head X includes all categories that are immediately dominated by, and do not immediately dominate, a projection of X.

Note that the relation of domination is only defined for whole categories, and not for segments. Given the adjunct status of specifiers in the Antisymmetry theory, this definition entails that the specifier of a category XP does not fall in the minimal domain of its head X, but rather in the minimal domain of the immediately higher head:

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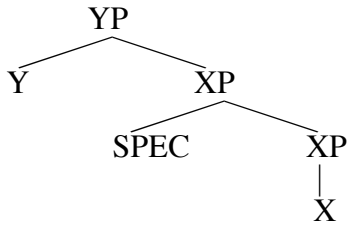
4 From this perspective, it is necessary to assume that the relative determiner does not bind the open position of its NP complement: see Bianchi (1995: 58-64).

5 In a similar way, according to Chomsky (1995: 372), expletive *there* differs from locative *there* in that it has an N- categorial feature to be checked by its NP "associate".

6 According to Chomsky (1995: 178), this is not a proper checking configuration, because NP is not included in the checking domain of D°; however, it is also possible to assume that D° attracts the relevant features of N° in LF (cf. Chomsky 1995: 297 ff.).

(13)



Consider now from this perspective the proposed relative structures (5) and (8). In (5), the relative determiner incorporates to the external one, and the minimal domain of the latter is extended, including the NP complement of the incorporated head (cf. Chomsky 1995: 180). In (8), instead, the NP 'head' raises to the Spec of the pied piped PP, where it is only covered by one segment of PP and one segment of CP; by definition (12), it falls in the minimal domain of the external D°.[7] Thus in both structures the external determiner and the NP 'head' are in a strictly local relation, which is essentially equivalent to the head-complement relation of (11).

As for the reduced relative (9), it is necessary to assume that the [+N], [+V] category raised to Spec,CP is able to check the phi-features of the external determiner. This hypothesis is supported by the observation that in languages with a clitic definite determiner, the latter can attach either to the noun or to the first prenominal adjective:

(14) omul batrîn
man-the old
(15) batrînul om (Rumanian; Giusti 1994: 242)
old-the man

Within Kayne's approach, the two examples receive the following analysis. In (14), the nominal category has raised to Spec,CP of the reduced relative clause, and from this position its head has incorporated to the external determiner (Kayne 1994: 88). In (15), instead, the adjectival phrase has raised to Spec,CP, as in (9), and its head A° has incorporated.

Thus, the alternative cliticization patterns in (14)-(15) receive a straightforward explanation in Kayne's approach, and provide independent support for his analysis of reduced relatives.

To summarize the preceding discussion, it has been argued that:

(i) an (argument) relative 'head' is always generated as a DP introduced by a relative determiner;

(ii) the relative determiner can be deleted by abstract incorporation to the external determiner;

(iii) the external determiner bears some strong (phi- and) categorial features which trigger the raising of a [+N] category to a position that falls within the determiner's minimal domain.

Besides these general questions, Borsley raises two further objections concerning the morphosyntax of the relative determiner and of the NP 'head'. First, he points out that such morphemes as *who, where, when* can be used as relative pronouns, and hence, in the raising analysis, they must be determiners selecting the NP 'head'; but, unlike *which*, they never appear with an overt NP complement:

(16) a. $[_{DP}$ the $[_{CP}[_{DP}[_{NP}$ man$]$ $[_{DP}$ who t$]]_j$ [Bill likes t_j]]
b. * $[_{DP}$ who $[_{NP}$ man$]]$ does Bill like t_j ?

In (16a), an apparently pronominal morpheme selects an NP which moves out of the complement position in overt syntax. This situation is attested in other cases: for instance, in Italian the indefinite determiner *qualche* is turned to the pronominal form *qualcuno* when its complement is removed by *ne*-cliticization (cf. Cardinaletti & Giusti 1994):

(17) a. ho interrogato [qualche [studente]]
b. ne_j ho interrogato [qualcuno $[e]_j$]

A similar point can be made with respect to 'split topicalization', assuming that it is an

[7] The same holds in the structure (3), where NP is covered by one segment of DP and one segment of CP.

instance of movement of the determiner's complement:[8]

(18) a. I have [no [inspiration]]
b. [inspiration]$_j$ have I [none [e]$_j$]

Thus, Universal Grammar allows a determiner to turn to a 'pronominal' form when its complement is extracted, for reasons probably related to the licensing of the empy category.[9] , [10]

The second objection concerns languages with overt Case marking: in these, the NP 'head' shares the Case of the external determiner, and not that of the original relative determiner:

(19) widzialem [$_{DP}$ tego [$_{CP}$[$_{DP}$[$_{NP}$ pana] [$_{DP}$ który t]]$_j$ [t$_j$ zbil ci szybe]]]
saw$_{1SG}$ the$_{ACC}$ man$_{ACC}$ who$_{NOM}$ broke your glass$_{ACC}$
'I saw the man who broke your glass'
(Polish; Borsley's (54))

Borsley argues that the configuration in (19) should give rise to a Case clash, because the NP 'head' would receive the Accusative case from the external determiner and the Nominative Case from its trace.

With respect to this problem we shall assume - following Giusti (1993) - that being Case-marked is a property of the D° position; as for the Case morphology on the noun, we shall assume that N° morphologically agrees with the determiner by which it is governed.[11] With these assumptions, the configuration in (19) is unproblematic: the external D° bears the Accusative Case assigned to it by the matrix verb, and the relative D° bears the Nominative Case assigned to it within the relative clause. As the NP 'head' comes to be governed by the external D° by the end of the derivation, in the Morpho-Phonological component the Case feature of this D° is copied into it, and it is spelled out in the Accusative form.[12]

In conclusion, the proposed modification of Kayne's (1994) raising analysis provides an answer to the objections that we have reviewed so far. The crucial point is that the external determiner of the relative structure must be allowed to interact with the specifier of its CP complement, allowing the incorporation of the relative D°, and establishing a checking relation with the NP 'head'. Apart from this, no special 'machinery' seems to be required, and the analysis turns out to be restrictive enough so as not to overgenerate illicit structures.

One question which was left open in the preceding discussion concerns the alternation

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8 Cf. also the discussion around (59) in section 4.

9 Kayne (1994: fn. 12 to chapter 8) mentions that *who* could be a form of *which* agreeing with a [+human] NP in its Spec.

10 The case of *when* and *where* is slightly more complex:
(i) the [$_{DP}$ [$_{NP}$ town] [$_{DP}$ where t]] Bill lives
(ii) * Where town does Bill live ?
Here the wh-morphemes seem to be syncretic forms merging a relative determiner and a temporal or locative preposition:
(iii) the [$_{PP}$ [$_{NP}$ town] [$_{PP}$ in [$_{DP}$ which t]]] Bill lives
Suppose that the syncretic form is the result of the incorporation of the relative D° to an abstract preposition: then the generalization would be that incorporation is allowed only if the determiner's complement is empty.

11 This hypothesis is supported by the observation that in languages like e.g. Russian, the Case assigned to a DP can be realized on the determiner only, while NP realizes the Genitive Case assigned by the determiner itself (cf. Babby 1987, Franks 1994):
(i) poslednie pjat' butylok (Russian; Babby 1987: 92)
last$_{NOM}$ five$_{NOM}$ bottles$_{GEN}$
'the last five bottles'

12 In some languages like Ancient Greek and Latin, a relative determiner that is assigned a structural Case within the relative clause can be "attracted" to the Case of the external determiner:
(i) a[ndre" a[xioi th‘" ˇeleuqeriva" h{" kevkthsqe (Wallace 1982: 245)
men worthy the$_{GEN}$ freedom$_{GEN}$ which$_{GEN}$ (you) possess
'men worthy of the freedom which you possess
This too seems to be an instance of 'copying' a Case feature under government by the external determiner. It can be assumed that the structural Case feature of the relative D° has already been checked and erased by the time it reaches Spec,CP. Similarly, in (5) above the relative D° has already checked its internal Case by the time it incorporates to the external D°.

between overt and deleted relative determiners. It was argued that in a relative clause like (1), the relative determiner has been deleted by incorporation (cf. (5)); however, it is unclear what triggers this incorporation in the first place.[13]

The next section discusses how this deletion mechanism interacts with the distribution of the complementizer to derive the so called 'Doubly Filled Comp' effects.

3. 'Doubly Filled Comp' effects

A well known puzzle in the syntax of relative clauses is the interaction of relative pronouns and complementizers. Though the relative pronoun is usually assumed to move to Spec,CP, to the left of the complementizer *that*, the two elements cannot cooccur overtly in contemporary English:

(20) * the picture [$_{CP}$ which$_i$ [that [$_{IP}$ I saw t$_i$]]

In the standard analysis, (20) is subject to the Doubly Filled Comp Filter (Chomsky & Lasnik 1977: 446). In order to comply with the filter, an obligatory deletion rule applies. If it deletes the relative pronoun, the result is the *that*-relative (21); if instead it deletes the complementizer, the result is the wh-relative (22):

(21) the picture [$_{CP}$ e_i [that [$_{IP}$ I saw t$_i$]] (*that*-relative)
(22) the picture [$_{CP}$ which$_i$ [*e* [$_{IP}$ I saw t$_i$]] (wh-relative)

Moreover, an optional rule of *that*-deletion can derive from the *that*-relative (21) the zero relative (23):

(23) the picture [$_{CP}$ e_i [*e* [$_{IP}$ I saw t$_i$]] (zero relative)

As Borsley (1994: 13) points out, the raising analysis is inconsistent with the Doubly Filled Comp Filter: in fact, a *that*-relative is analysed as having two overt elements in Comp, the relative 'head' in Spec,CP and *that* in C°, as shown in (1), repeated here:

(1) [$_{DP}$ the [$_{CP}$ [picture]$_i$ [that [$_{IP}$ Bill saw t$_i$]]]]

But if we abandon the Doubly Filled Comp Filter, we are left without an explanation for the data in (20)-(23).

The following discussion will sketch an account of the 'Doubly Filled Comp' effects within the framework of the raising analysis. It should be stressed that the interaction of relative determiners and complementizers is subject to considerable cross-linguistic and diachronic variation, and any adequate account of these phenomena must adopt a comparative perspective. Since a full discussion of this issue would exceed the limits of this paper, it will only be possible here to sketch an analysis for the English data in (20)-(23) and compare these to the corresponding data in Western Romance.

As a first step of our argumentation, let us compare the wh-relative (22) to the zero relative (23). In the standard analysis, both have a deleted C°. However, it can be shown that the empty complementizer behaves differently in the two structures.

Consider the phenomena of topicalization and negative preposing. For most English speakers, these are possible in declarative complement clauses only if introduced by an overt complementizer:

(24) a. I didn't know [that yesterday Peter danced]
b. * I didn't know [*e* yesterday Peter danced]
(25) a. I didn't know [that never had Peter danced so well]
b. * I didn't know [*e* never had Peter danced so well]
(Kayne 1994: 28-29)

A similar contrast opposes *that*-relatives like (21) to zero relatives like (23):

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[13] Given the formulation of Last Resort by Chomsky (1995: 280), the incorporation of the relative D° cannot be triggered by the need of establishing a checking relation between the external D° and NP.

(26) a. this is the kind of car [that [for my son [I wouldn't even have considered buying]]]
b. * this is the kind of car [*e* [for my son [I wouldn't even have considered buying]]]
(27) a. I saw a dress [that [under no circumstances would [I have considered buying for my daughter]]]
b. * I saw a dress [*e* [under no circumstances would I have considered buying for my daughter]]]

The data in (24) to (27) suggest the generalization that topicalization and negative preposing are only licensed in clauses introduced by an overt complementizer. But this generalization is falsified by wh-relatives: though they have an empty complementizer, they pattern with *that*-relatives rather than with zero relatives in allowing topicalization and negative preposing:

(28) a. a man whom [*e* [for his brutal insolence and cruelty [Robin had long hated]]]
b. John is the kind of person who [*e* [under no circumstances would I be willing to talk to]]

This suggests that the empty complementizers of (22) and (23) are actually different heads with distinct properties.

This hypothesis can be formulated in the framework of Rizzi's (1995) 'split CP' hypothesis. According to Rizzi, the complementizer system of a clause does not consist of a single projection CP, but of an array of distinct projections: the highest one is headed by the declarative complementizer *that*, and the lower ones accommodate topicalized, focussed and wh- phrases.

From this perspective, the difference between *that*- and zero complement clauses can be characterized as follows: *That*- complement clauses are introduced by the highest head of the complementizer system, C° = *that*; zero complement clauses are instead introduced by a lower head of the Comp system, which is phonetically null. As the nature of this head is not immediately relevant to the present discussion, it will simply be labelled X°. The corresponding representations are (29) and (30):

(29) I didn't know [$_{CP}$ that [Topic [IP]]]
(30) I didn't know [$_{XP}$ e [Topic [IP]]]

The hypothesis can be extended to the contrast between the *that*-relatives and the zero relatives in (26)-(27): in the *that*-relative, the relative DP targets Spec,CP, whereas in the zero relative it targets Spec,XP:

(31) [$_{DP}$ the [$_{CP}$ [$_{DP}$ D_{REL} picture]$_i$ [$_{CP}$ that [$_{IP}$ I saw t_i]]]]
(32) [$_{DP}$ the [$_{XP}$ [$_{DP}$ D_{REL} picture]$_i$ [$_{XP}$ e [$_{IP}$ I saw t_i]]]]

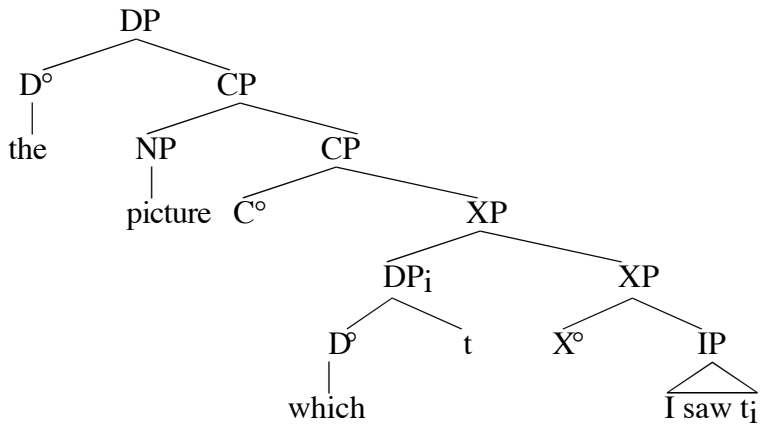
Thus, the alternative selection of C° and X° in the complementizer system of declarative clauses accounts for the optional omission of *that*.

Let us now consider the wh-relative (22). Kayne (1994: 90) proposed that it is derived by raising the NP 'head' to the Spec of the relative determiner, as shown in (3) above. Let us instead assume that this movement is universally excluded: Spec,DP is not accessible to an NP category.[14] If this is so, then, given the restrictiveness of the Antisymmetry theory,[15] the NP 'head' and the relative determiner that it strands must occupy the specifiers of two distinct maximal projections in the Comp system. Note that under our previous assumptions, two such positions are indeed available - namely, Spec,CP and Spec,XP. The derivation of the wh-relative can proceed as follows: the relative DP first targets Spec,XP, as in the zero relative; the NP 'head' is then extracted and moves to Spec,CP. The resulting representation is (33):

14 Cf. Szabolsci's (1994: 201-4) claim that Spec,DP is an operator position.

15 In the Antisymmetry theory every maximal projection has at most one adjoined specifier position.

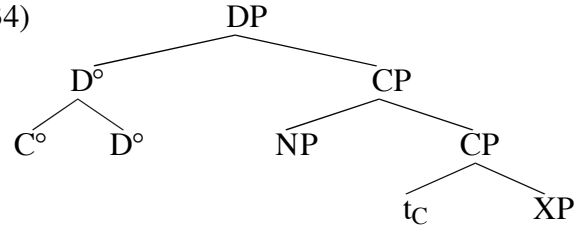
(33)



Thus, the wh-relative is more marked than the other two relative clause types in that it requires the realization of two distinct projections of the Comp system.

Note that the representation (33) brings back the problem of complementizer deletion: in fact, the head C° is syntactically present, but it fails to be spelled out as *that*. In this respect, it is possible to exploit the same mechanism of abstract incorporation which accounted for the deletion of the relative determiner in (5). Specifically, let us assume that C° in (33) can incorporate to the immediately higher head, the external determiner,[16] and thus fails to be spelled out:

(34)



At this point, we are faced with the question of why the deletion of C° is obligatory in (33) (cf. the ungrammaticality of * *the picture that which I saw*); the same question arose with respect to the deletion of the relative D° in (5).

Intuitively, the deletion by incorporation of a terminal symbol seems to be determined by economy considerations, since the resulting representation can be considered more economical, at least with respect to the Morpho-Phonological interface. Therefore, let us tentatively assume the following economy principle:

(35) Economy of Representation: delete a functional terminal symbol whenever possible.

The formulation of this principle is admittedly sketchy; but a full discussion of it would lead us too far.

Having sketched an alternative account, it remains to be seen how it can derive all of the 'Doubly Filled Comp' effects.

An interesting aspect of the proposed analysis is that the deletion of C° and of the relative D° must meet the same licensing condition, namely, incorporation to the external determiner. But the Antisymmetry theory disallows double adjunction to a head (cf. Kayne 1994: 19). It follows that in every relative structure it is possible to license the deletion of either C° of D°, but not of both at the same time.

Let us now reconsider the proposed relative structures, starting from the *that*-relative:

(36) [DP DREL+the [CP [DP tD picture]i [CP that [IP I saw ti]]]]

After the DP has raised to Spec,CP, the relative D° can incorporate to the external determiner, and the economy principle (35) forces this option. On the other hand, this prevents the incorporation of C°, and the latter must be spelled out as *that*.

16 This proposal presupposes that C° has 'nominal' features that make it compatible with the external D°. Recall that C° is selected by the external D°.

Note that if C° were to incorporate instead of D°, the derivation would not converge:

(37) * [DP C°+the [CP [DP D_{REL} picture]$_i$ [CP t_C [IP I saw t_i]]]]

In fact, in the resulting structure the NP 'head' falls outside the minimal domain of the external D°, and the required checking relation does not obtain (cf. the text around (11)-(13) above).

Consider then the wh-relative, schematically repeated here as (38):

(38) [DP C°+D° [CP NP [CP t_C [XP [DP D_{REL} t_{NP}] [XP X° IP]]]]]

In this structure, the relative D° is stranded in too low a position to incorporate to the external determiner; therefore, its deletion cannot be licensed. On the other hand, nothing prevents the incorporation of C°, and by principle (35), this is obligatory.[17]

As for the zero relative, recall that it is not possible to license the deletion of both the relative D° and C°; therefore, the omission of *that* must correspond to the realization of X° in the Comp system. As X° is intrinsically null, it does not require deletion through incorporation, and nothing prevents the incorporation of the relative determiner:

(39) [DP D_{REL}+the [XP [DP t_D book]$_i$ [XP e [IP I read t_i]]]]

In this way, PF deletion is reduced to a standard syntactic process - incorporation - which is subject to well known constraints. This deletion mechanism, triggered by the economy principle (35), derives the 'Doubly Filled Comp' effects in the left periphery of relative clauses.

Let us briefly discuss two consequences of the proposed analysis.

The first one concerns the licensing of topicalization and negative preposing in (26)-(28). It was pointed out that in this respect the wh-relative and the *that*-relative are opposed to the zero relative. A look at the structures in (36), (38) and (39) suggests a possible generalization: the *that*-relative and the wh-relative are opposed to the zero relative in that their Comp system includes the highest head C°. A plausible conjecture is that C° plays a crucial role in licensing topicalization and negative preposing, for reasons that remain to be determined.

The second consequence concerns the distribution of relative determiners and of the complementizer in Western Romance languages. As discussed by Kayne (1976) and Cinque (1982), Western Romance languages differ from English in that they lack both the wh-relative and the zero relative. Consider the representative Italian paradigm in (40):

(40) a. il quadro che ho visto (*that*-relative)
b. * il quadro il quale ho visto (wh-relative)
c. * il quadro ho visto (zero relative)
d. il quadro di cui ti ho parlato (pied piping relative)

In the present analysis, (40b-c) receive a unitary explanation. As shown in (38) and (39) above, the derivation of both the wh-relative and the zero relative crucially exploits the Spec of the lower complementizer head X°. The ungrammaticality of (40b-c) can then be reduced to the hypothesis that the Comp system of Italian lacks a null head X° that can substitute for C° in declarative clauses.[18]

On the other hand, the *that*-relative (40a) and the pied piping relative (40d) are allowed because their derivation only involves Spec,CP (with PF deletion of C° in the pied piping relative).

Interestingly, it can be shown that early stages of the Tuscan dialect (the ancestor of Modern Italian) allowed the omission of the complementizer both in complement clauses and in relative clauses:[19]

(41) a. e convenia loro confessare _ aveano fatta congiura... (*Cronica*, II, 21)
and they had better confess (that) they had made a conjuration

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17 The same holds, *mutatis mutandis*, in the pied piping structure (8).

18 Note that Italian also lack the free omission of the complementizer in declarative complement clauses.

19 Cf. Wanner (1981). The following data are taken from the Florentine Dino Compagni's *Cronica* (early XIV century).

(41) b. ordinorono ucciderlo il dì _ menasse la donna (*Cronica*, I, 2)
(they) ordered to kill him the day (that) he would bring home the woman

By our previous assumptions, this implies that the Comp system of the Tuscan dialect had a null complementizer-like head X° below C°. The prediction is, then, that the two projections could be exploited for the derivation of the wh-relative. The prediction is confirmed by the data:

(43) per raddomandare certe giurisdizioni d'uno castello il quale teneano i Fiorentini...
to claim back the jurisdiction of a village which dominated the Florentines
(*Cronica* II, 4)

Summarizing, this section presented the sketch of an analysis for the 'Doubly Filled Comp' phenomena within the raising approach to relative clauses. Though limitations of space prevented us from discussing the details of the proposal, the aim of the discussion was to show that the raising analysis allows for an account of these phenomena - one that is at worst equally stipulative, and perhaps more insightful, than the standard approach based on the Doubly Filled Comp Filter.

4. Stacking, coordination, and extraposition

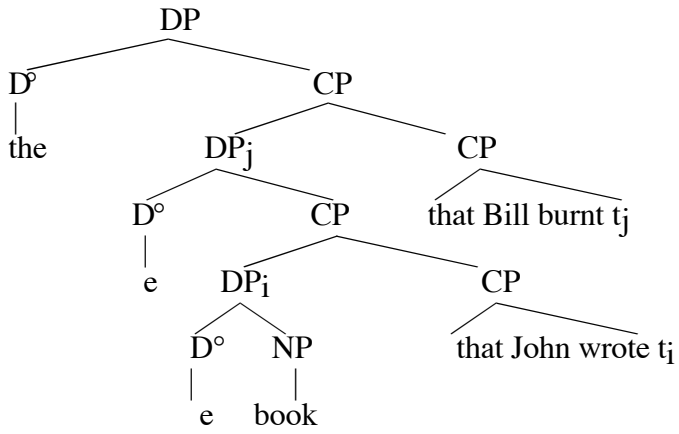
Let us now turn to another set of problems that is more directly related to the phrase structure of relative clauses.

A first problem is the stacking of restrictive relatives, as in the following examples:

(44) the book that John wrote that Bill burnt (Borsley's (34))
(45) the book which John wrote which Bill burnt (Borsley's (57))

Borsley correctly argues that stacking requires a recursion of the raising structure whereby the 'head' of the outer relative clause is a DP itself including the inner relative clause. For instance, the structure of (44) should be something like (46) (Borsley's (43)):

(46)



The problem with this structure, Borsley observes, is that it has two empty determiners, and we must ensure that they are both obligatorily empty.

Given our previous discussion, we can assume that this is the effect of a double abstract incorporation: the lower relative determiner of DP_i incorporates to the higher determiner of DP_j, which selects the inner CP, and the resulting complex head incorporates to the highest external determiner *the*; both steps are triggered by the economy principle (35).

In the case of (45), the recursive structure is slightly more complex. The base structure is (47):

(47) $[_{DP}$ the $[_{CP2}[_{IP2}$ Bill burnt $[_{DP2}$ which $[_{CP1}[_{IP1}$ John wrote $[_{DP1}$ which book]]]]]]]

Once again, the inner relative clause is included in the DP 'head' of the outer one. The derivation proceeds as follows: the lowest relative DP_1 raises to the Comp system of the inner relative clause, where the NP $[_{NP}$ book] strands its relative determiner *which* :

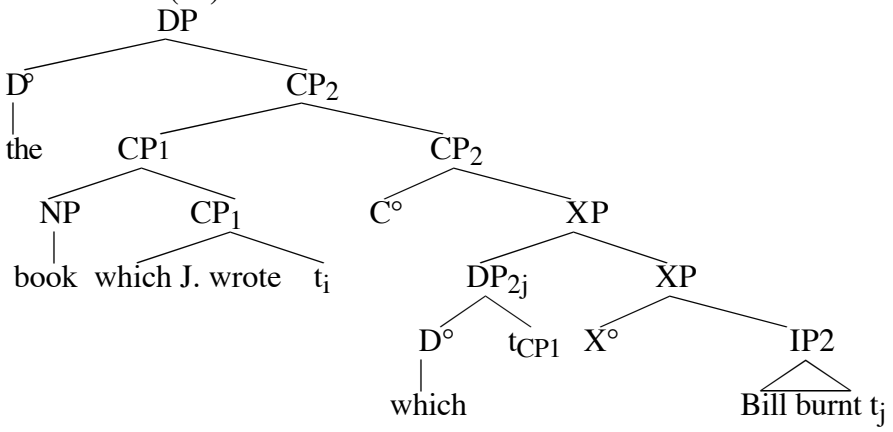
(48) $[_{DP}$ the $[_{CP2}[_{IP2}$ Bill burnt $[_{DP2}$ which $[_{CP1}$ book $[_{DP1}$ which t$]_i$ $[_{IP1}$ John wrote t_i

Then the relative DP_2, including the inner relative clause CP_1, raises to the Comp system of the outer relative CP_2:

(49) $[_{DP}$ the $[_{CP2}$ $[_{DP2}$ which $[_{CP1}$ book which John wrote t$]]_j$ $[_{IP2}$ Bill burnt t_j]]]

As a final step, the relative CP_1 moves to the left of the relative determiner *which* selecting it. The resulting representation is (50):

(50)



Note that in (50) the NP $[_{NP}$ book] originating within CP_1 has reached a position that falls in the minimal domain of the highest external determiner, so that the required checking relation is ensured.

A second problem is the coordination of two relative clauses, as in (51) and (52):

(51) the picture [which Bill liked] and [which Mary hated] (Borsley's (55))
(52) the picture [that Bill liked] and [that Mary hated]

In the raising analysis, these examples would involve an across-the-board extraction of the NP/DP 'head' from the coordinated relative clauses. But in Kayne's (1994) analysis, the coordinated strings are not even constituents: in fact, in (51) the relative determiner *which* must have the NP 'head' in its Spec (cf. (3) above), and in (52) the C° *that* must have the relative NP in its Spec (cf. (1) above).

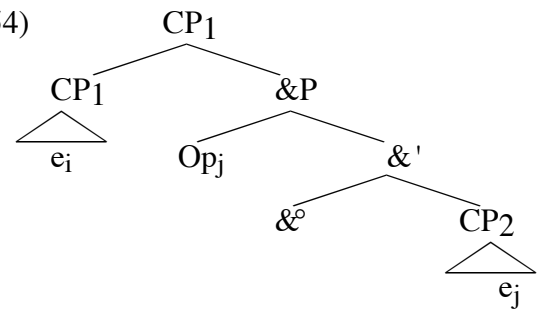
Note that the problem concerning (51) does not arise under the analysis of the wh-relative proposed in the preceding section (cf. (38) above). In fact, (51) may involve the coordination of two XPs with across-the-board extraction of the NP 'head' from Spec, XP:[20]

(53) $[_{DP}$ the $[_{CP}[_{NP}$ picture] C° $[_{\&P}[_{XP}[_{DP}$ which t$]_i$ Bill liked $t_i]$ $[_{\&P}$ and $[_{XP}[_{DP}$ which t$]_j$ Mary hated t_j]]]]]

However, the problem still holds for the coordination of *that*-relatives in (52).

A solution to this problem comes from the null operator analysis of across-the-board gaps proposed by Munn (1992). Munn argues that coordination is syntactically an asymmetric relation mediated by a 'Boolean' functional head. The across-the-board gap in the second conjunct of a coordination is bound by a null operator which lands in the specifier of the Boolean head; the whole Boolean phrase is right-adjoined to the first conjunct:

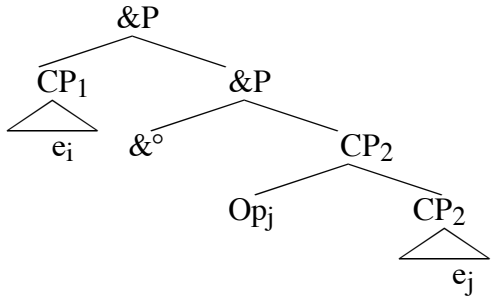
(54)



[20] Cf. Borsley's footnote 6.

Though this proposal is not directly compatible with the Antisymmetry theory, it can be slightly revised in the following way (Kayne 1994: 59): the null operator lands in the Spec of the second conjunct CP_2, and the first conjunct CP_1 is in the Spec of the Boolean head:

(55)



Turning to (52), it can now be assumed to involve the cordination of two CPs complement to the external determiner: the Spec of the first conjunct contains the relative DP, while the Spec of the second conjunct contains the null operator:

(56) $[_{DP}$ the $[_{\&P}[_{CP1}$ $[_{DP}$ D° picture$]_i$ $[_{CP1}$ that Bill liked $t_i]]$ $[_{\&P}$ and $[_{CP2}$ Op_j $[_{CP2}$ that [Mary hated $t_j]]]]]]$

A third problem which Borsley discusses extensively is relative clause extraposition. The phenomenon is exemplified in (57) (Borsley's (60)):

(57) [a man] came into the bar [who we knew in school]

The standard analysis takes the extraposed relative clause to be right-adjoined to VP or IP; but this analysis is inconsistent with the Antisymmetry theory, which excludes right adjunction on principled grounds. The raising approach opens a new perspective on the phenomenon: this can be thought of as the leftward movement of the 'head' which strands the relative clause in the base position (Kayne 1994: chapter 9).

(58) $[_{QP}$ a man$]_j$ came into the bar [$[e]_j$ who we knew in school]

Borsley raises a number of objections against this hypothesis. First, in (58) the extracted QP must have originated as a complement to the relative determiner; therefore, it is necessary to generate a complex DP like (59):

(59) $[_{DP}$ wh $[_{QP}$ a $[_{NP}$ man]]]

But this structure is never overtly realized; the indefinite article cannot follow another determiner.

Note however that the structure in (59) is overtly attested with numerals:

(60) $[_{DP}$ which $[_{QP}$ two $[_{NP}$ books]]]

This suggests that the structure in (59) is licit, but the underlying indefinite determiner cannot be spelled out.

The problem can be easily solved if we adopt the conception of functional terminal symbols proposed in section 2. According to that proposal, functional morphemes are the spellout of abstract sets of features. From this perspective, then, we can assume that the indefinite determiner is the spellout of a Q° dominating the feature [singular]. The comparison of (58) and (59) suggests the following hypothesis: in (58), where Q° is spelled out, it is ungoverned; in (59), where it fails to be spelled out, it is governed by the highest head D°.

Note that this is exactly the same generalization that we proposed for the deletion of the relative determiner in section 2. Therefore, we can assume that the same mechanism of abstract incorporation is at work here: specifically, in (59) the [singular] Q° incorporates to D° and thus gets deleted; in (58), on the contrary, incorporation is impossible, and Q° must be spelled out as an independent morpheme.

Note in passing that this hypothesis also accounts for the 'regeneration' problem for split

topicalization - namely, the fact that after split topicalization has taken place, an indefinite determiner is 'regenerated' in front of a topicalized singular NP (van Riemsdijk 1989):[21]

(61) a. er kann sich noch [keinen [(*einen) Wagen]] leisten.
he can himself yet no car afford
b. [einen wagen] kann er sich noch [keinen e] leisten
a car can he himself yet no(ne) afford

Another objection of Borsley's concerns the clause-final position in which the relative clause is stranded. On the one hand, the extraposed relative follows all the verbal complements and modifiers; in (58), for instance, it follows the locative PP. On the other hand, the relative clause cannot be stranded in the intermediate position of a chain:

(62) * [One man]$_i$ seemed [$_{IP}$ [[e]$_i$ who knew the truth]$_j$ to be late t$_j$]

This requires a set of additional assumptions. In order to explain the clause-final position, it is necessary to assume that both the verb and its complements / modifiers obligatorily move to the left of the stranded relative; but the landing site and the trigger of these movements are unclear. Furthermore, the ban against stranding in an intermediate chain link sharply opposes relative clauses extraposition to another instance of stranding, namely quantifier floating (cf. Sportiche 1988).

Concerning the second problem, a possible approach emerges if we slightly revise the structure in (58). Note that under the assumption that an argument must be a DP (cf. the discussion above (4)), it follows that in (58) the stranded relative must be introduced by a null external determiner which allows the extraction of the QP 'head'. More accurately, the representation is (63):

(63) [$_{QP}$ a man]$_j$ came into the bar [$_{DP}$ e [$_{CP}$ t$_j$ who we knew in school]]

From this perspective, the restriction to the clause-final position may be related to the licensing requirements of the empty determiner.

This hypothesis is supported by the parallelism between relative clause extraposition and another 'splitting' construction which is usually analysed as the leftward movement of a DP subconstituent, leaving an empty category in front of the stranded DP:

(64) combien a-t- il consulté [[e] de livres] ?
how much did he consult of books
'how many books did he consult?'

Besides extracting *combien,* it is also possible to front the whole wh-phrase, and in this case the past participle agrees with the fronted phrase:

(65) [Combien de livres] a-t-il consultés?

Assuming Kayne's (1989) analysis of participial agreement, the wh-phrase in (65) must have passed through the Spec of the participial Agr. Note now that the remnant DP cannot be stranded in this intermediate position by the extraction of *combien* alone:

(66) * combien a-t-il [[e] de livres] consultés?

In this respect, *combien* extraction patterns with relative clause extraposition (cf. (62)) and against quantifier floating:

(67) Il les$_j$ a [tous [e]$_j$] consultés t

Note that (64) and, under our assumptions, (63) differ from (67) in that they have an empty

[21] Deletion through incorporation is impossible if Q° dominates a numeral, as in (60). This suggests that, contrary to the number value singular/plural, the specific cardinality value conveyed by numerals cannot be subsumed under the feature content of D°, but it must be expressed by an independent morpheme.

category in front of the stranded DP.[22] The contrast can be reduced to the hypothesis that this empty category can only be licensed in the base position. Though this constraint recalls the old notion of theta-government, its status in the present syntactic theory is unclear. Whatever the ultimate explanation may be, the important observation is that with respect to the unavailability of intermediate chain positions, relative clause extraposition can be assimilated to a structure like (64), for which a stranding analysis is uncontroversial.

As for the relative ordering of the extraposed relative and of verbal complements and modifiers, Kayne (1994: 120-122) suggests that the relative clause is stranded in a non-Case marked position which is below the normal Case marked DP positions; this low position can be crossed over by the scrambling of various PP complements or adverbials. If it can be identified with the base VP-internal position, Kayne's hypothesis would converge with the conclusion independently reached in the preceding paragraph.

Borsley objects that there aren't enough available positions for this rearrangement of the constituents, and moreover, the trigger of this rearrangement is unclear. An answer to both objections can be found in the theory of prosodically driven reordering of constituents recently proposed by Zubizarreta (1994). Zubizarreta argues that the scrambling of VP-internal constituents can be triggered by the need of obtaining a prosodically wellformed structure; the target positions of this scrambling she dubs 'P-positions'.

The hypothesis that the clause-final position of the extraposed relative is obtained by prosodic rearrangement is supported by the observation that at least in Italian, an extraposed relative can be followed by a PP if the latter is sufficiently 'heavy':

(68) ? [$_{QP}$ Che libro] hai trovato [[e] che ti serviva per l'esame] [$_{PP}$ in quella famosa libreria di Firenze] ?
which book did you find that you needed for the exam in that famous bookshop in Florence?

Thus, though various aspects of the problem remain open for further research, the constraints on the surface position of the extraposed relative do not seem to undermine the stranding hypothesis.

A final objection of Borsley's is that the stranding of the relative clause seems to involve an instance of improper movement. In fact, in (69) the extracted 'head' moves from Spec,CP of the relative clause (an A' position) to Spec,IP (an A position):

(69) [$_{QP}$ a man]$_j$ walked in [$_{CP}$ t$_j$ that we knew in school]] (Borsley's (84))

In Kayne's (1994) analysis, the whole relative 'head' of the *that*-relative is a QP, and in (69) this QP directly raises from Spec,CP to Spec,IP. However, in section 2 we argued that even in the *that*-relative the QP 'head' is introduced by a tacit relative determiner. Thus, more accurately, the structure of (69) is (70):

(70) [$_{QP}$ a man]$_j$ walked in [$_{DP}$ D° [$_{CP}$ [D° t$_{QP}$] that we knew in school]]

The QP 'head' is extracted from the complement position of the relative determiner, which is plausibly L-related,[23] and hence an A position. Thus, we have an instance of proper A movement.

Consider then the extraposed wh-relative (63), repeated here:

(63) [$_{QP}$ a man]$_j$ came into the bar [$_{DP}$ e [$_{CP}$ t$_j$ who we knew in school]]

According to the proposal of section 3, the overt relative determiner is stranded in a Spec position below Spec,CP; the QP 'head' moves to Spec,CP in order to establish a checking relation with the external D°; then, from Spec,CP it moves on to Spec,IP:

(71) QP ... [$_{DP}$ D° [$_{CP}$ t$_{QP}$ C° [$_{XP}$ [$_{DP}$ who t$_{QP}$] X° ...]]]

At first sight, the second step seems to be an improper movement. Hovever, given the

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[22] In (67), instead, the empty category is the complement of the Q° *tous*, and it can be properly governed by it.

[23] We shall assume that the phi-features of a determiner count as L-features (in a slightly extended sense).

definition of L-relatedness in Chomsky (195: 196),[24] in the relative structure (71) Spec,CP is actually L-related, since it is in a local relation to the phi-features of the external determiner (cf. the discussion around (10)-(13) above). With this assumption, no improper movement arises in (71).[25]

This concludes our discussion of relative clause extraposition.

5. Non-restrictive relatives

The last problem that Borsley discusses in his paper concerns non-restrictive relatives. For these, Kayne (1994) proposes an innovative analysis. He argues that they have the same derivation as restrictive relatives up to Spellout; the difference arises in the LF derivation, where the appositive interpretation is obtained by moving the IP constituent of the relative clause out of the c-command domain of the external determiner:

(72) $[_{DP}$ IP $[D^{\circ}$ $[_{CP}$ DP_{REL} [C° $t_{IP}]]]]$

Assuming that the restrictive term of a determiner corresponds to its c-domain in LF, it follows that the scrambled IP will receive a non-restrictive interpretation.

Borsley argues that this analysis cannot account for examples like (73) (his (86)-(89)), appositive constructions where the 'head' is an AP, PP, VP of IP:

(73) a. Mary is [courageous], which I will never be
b. John is [in the garden], which is where I should be
c. Mary has [resigned], which John hasn't
d. [John was late], which was unfortunate

Borsley regards the possibility of non-nominal 'heads' as 'a fundamental fact about non-restrictive relatives'. But a raising analysis of these examples is problematic: in fact, it must be assumed that the AP/PP/VP/IP 'head' originates as a complement to the relative determiner *which*; and furthermore, it is unclear which external determiner would select the relative CP.

In his monograph, Kayne leaves open the question of whether examples like (73) should receive a raising analysis; some comparative evidence suggests that they probably should not. In the Italian equivalent of (73a) or (73d), the purported appositive relative clause cannot be introduced by the complementizer *che* or by a simple relative determiner, but it must be introduced by the relative-like connectors *cosa che* 'which thing', *il che* 'the that', *la qual cosa* 'the which thing':

(74) a. Maria è coraggiosa, cosa che io non sarò mai
b. Gianni arrivò tardi, il che / la qual cosa fu controproducente

Similarly, in the French equivalent of (73d) the relative clause is introduced by a pronominal 'head' *ce* distinct from the purported clausal 'head':

(75) Jean était en retard, ce qui était embarassant

If (73) are true appositive relatives, this asymmetry is mysterious.

Note also that in many languages relative pronouns can be used for cross-sentential anaphora in the so called *relatif de liaison*. (76) are representative examples:

(76) a. Una sola possibilità gli rimaneva per salvarsi. *La quale*, purtroppo, non era stata prevista da nessuno. (Cinque 1982: 262)
only one possibility was left open for him to save himself. Which, unfortunately, hadn't been foreseen by anybody
b. whom we name hereafter the Prince of Cumberland: *which honour* must not unaccompanied invest him only... (*Macbeth* I.4, 38-40)

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24 'A position is L-related if it is in a local relation to an L-feature'.

25 The following extraposition example, discussed by Kayne (1994: fn. 15 to chapter 9), is correctly excluded in the present analysis of the wh-relative, since the string *a man who* does not form a constituent:
(i) * a man who just walked in we knew in high school

Here the relative morphemes are used as anaphoric determiners or pronouns.[26] Then, nothing in principle excludes that the same anaphoric use is involved in (73). From this perspective, (73) are not relative structures at all: the relative pronoun is actually an anaphoric pronoun, and the purported appositive relative is either coordinated to the main clause or parenthetical. In conclusion, the examples in (73) are problematic for the raising approach only if this alternative analysis can be excluded, and it can be convincingly demonstrated that they must be true relative structures.

6. Conclusions

In this paper we have reviewed Borsley's (1996) objections against the raising analysis of relative clauses. We have argued that some modifications to the analysis originally proposed by Kayne (1994) provide an answer to these objections. The core of the proposal, however, remains unchanged. This analysis has not only the advantage (for us) of being compatible with the Antisymmetry theory, but it also provides various original insights into some well known puzzles in the syntax of relative clauses, for instance, the distribution of relative determiners and complementizers discussed in sections 2 and 3. Thus, the adoption of a new theoretical perspective on phrase structure has proven fruitful on the empirical side; of course; many other empirical domains remain open for future investigation.

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[26] It remains unclear why the relative morphemes allow such an anaphoric use. This problem cannot be addressed here.

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