ON RELATIVE CLAUSES

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ABSTRACT

The structure of relative clauses (RCs) remains controversial, as current attempts to replace adjunction theories are fraught with conceptual difficulties. This work shows how, assuming that RCs are predicates of their nominal antecedents and modification reduces to complementation, the advantages of adjunction analyses concerning constituency, direct derivation of surface order and correct scope, and transparent compositionality can be preserved within a minimalist theory that eliminates adjuncts, unifies Merge and phrase structure, and makes constituent order, including head-final effects, follow from Kayne's LCA while avoiding the selection mismatches, massive movement, ad hoc constraints, and Economy problems that Kayne's theory raises.

KEY WORDS: Modification, merge, Minimalism, relative clause.

RESUMEN

La estructura de las cláusulas de relativo (CRs) sigue siendo controvertida en la medida en que los actuales intentos de sustituir los análisis basados en la adjunción plantean serias dificultades conceptuales. Este trabajo muestra cómo, asumiendo que las CRs son predicados de sus antecedentes nominales y que la modificación se reduce a complementación, las ventajas de los análisis por adjunción en lo referente a la estructura de constituyentes, la derivación directa del orden visible y el alcance correctos, y su transparente composicionalidad pueden ser conservadas en una teoría minimista que elimina los adjuntos, unifica Merge y la estructura sintáctica, y hace que el orden de constituyentes, incluyendo los efectos de núcleo en posición final, se deduzcan del LCA de Kayne, pero a la vez evita las discordancias de selección, movimientos masivos, restricciones ad hoc y problemas de Economía que plantea la teoría de Kayne.

PALABRAS CLAVE: modificación, fusión, minimalismo, cláusulas de relativo.

1. THE STATE OF THE ART

1.1. INTRODUCTION

Like many other aspects of modification, the structure of NPs containing relative clauses (RCs henceforth) has been controversial since the earliest TGG work

on the topic. Smith (1964: 37-38, 47) took the RC to be a complement of the Det and proposed to account for surface order in terms of an obligatory Extraposition rule. That early [Det+RC] analysis is adopted in Chomsky (1965: 128-9, 217 fn. 26), but an alternative base-generated [NP+RC] account was soon proposed in Ross (1986: 11-12) and defended in Chomsky (1977, 1981: 143, fn. 69), Bach and Cooper (1978), McCloskey (1979: 21-25), Cinque (1982), Safir (1986: 665), Lebeaux (1991), Chomsky and Lasnik (1993: 70-71), and González Escribano (1995), among others, and a third view, the [N'+RC] theory, proposed by Stockwell et al. (1973) and Partee (1975: 229-231, 1976: 53-55)) mainly on semantic grounds, became a standard alternative in such works as Jackendoff (1977), Stowell (1981), McCawley (1981), Gazdar et al. (1985), Fabb (1990), and Sag (1997), among others.

Research starting with Abney's (1987) re-analysis of NPs as DPs has led to the postulation of an elaborate functional structure in nominals, but the problem of RCs has not really found any new solutions, and the three early hypotheses already mentioned have remained in competition. The main news in this area is that, starting perhaps with Larson's (1988) proposal to treat low adverbials as specifiers, there is a sustained effort by Kayne (1994), Chomsky (1995), Cinque (1994, 1999) and other syntacticians to reduce all adjuncts to complements or specifiers. This has led Kayne (1994) to revive a version of Smith's [Det+RC] analysis, but, as Borsley (1997), Büring and Hartmann (1997), and Ernst (2002: 191-205) have shown, the Kaynean approach is fraught with technical and empirical difficulties, and, for reasons explained in Svenonius (1994), Ernst (2002), and in more detail below, so is Cinque's attempt to reduce all modifiers to specifiers of functional heads.

Therefore, it is fair to conclude that the issue of RC structure, as that of the structure of modifiers in general, remains largely open. Chomsky (1995: 382, fn. 22) plainly confesses that 'we still have no good phrase structure theory for such simple matters as attributive adjectives, relative clauses, and adjuncts of many different types', and Ernst (2002: 1) starts his large scale analysis of adjuncts declaring that 'Nobody knows exactly what to do with adverbs', but he could have generalized his conclusion to all modifiers.

In response to that state of affairs, in González Escribano (2004) a new theory of modification as complementation is defended which eliminates adjuncts, reconciles the advantages of adjunction analyses with Kayne's elegant theory of the relation between structure and surface word order, and explains the distribution of modifiers and related Head Final effects. The present work extends the same approach to relative clauses.

1.2. THE DET S' THEORY

The Det+RC analysis is so at odds with observable order and requires so much adjustment via obligatory movement that at first blush it would seem to be a rather implausible candidate, in its early version because adjunction operations like

Extraposition are now dubious at best in mainstream TG grammar, and in its Kaynean variant because massive unmotivated Raising is required in violation of Economy. However, that RCs are closely associated with Dets follows from Russell's (1905) Theory of Definite Descriptions and has been a common assumption in formal semantics (e.g., Vendler 1967, Keenan and Stavi 1982: 284-5), as well as in the syntactic literature since at least Smith (1964) (cf. Stockwell et al. 1973: 424, Jackendoff 1977: 178-182, Abney 1987: 314-315, Rothstein 1988: 1014, etc.).

The usual assumption (e.g., Smith 1964, Vergnaud 1974, Jackendoff 1977, Kayne 1994) is that the RC depends on the Det, but Perlmutter (1970: 241-2) defended the opposite view, actually claiming that the article is a by-product of the process of relativization. What makes Smith's (1964) and later on Vergnaud's (1974) and Kayne's (1994) analyses appealing is that they make the dependency between Dets and RCs a consequence of complementation, whereas competing NP+RC and Det+Nom theories must capture it by a structurally weaker binding relation between the Det and the RC.

The main issues in this area, then, are a) whether the dependency between Dets and RCs is such as to claim a head-complement relationship between them, and, in the current climate, b) whether a Kaynean D+RC approach is technically sustainable.

As to the former, Smith (1964: 47) already points out contrasts like (1), where the DP in predicative position seems to require a RC or equivalent specification.

(1)   a. ?John is the linguist.
        b. John is the linguist who spoke at the meeting.

However, (1a) is not too bad, and it is easy enough to think of contexts where it would be acceptable (e.g., if the context is a spaceship and the crew consists of an engineer, a pilot, a physicist, a doctor, and a linguist, (1a) would not sound strange at all), although perhaps definite Dets always have explicit or elliptical restrictive modifiers, as Rothstein (1988: 1014) claims, and (1a) does after all contain an elliptical one.

Perlmutter (1970: 244-5) adds cases like (2-6) and assumes that the RC is what accounts for the presence of the Det in them:

(2)   a. *The Paris no longer exists.
        b. *Paris that I loved/of the nineteenth century no longer exists.
        c. The Paris that I loved/of the nineteenth century no longer exists.

(3)   a. *The book of John's is in the bathtub.
        b. *Book of John's that you want is in the bathtub.
        c. The book of John's that you want is in the bathtub.

(4)   a. *the one/only man
        b. *only man who was single
        c. the one/only man who was single

(5)   a. *The few customers dribbled in in the late afternoon.
      b. The few customers that came by dribbled in in the late afternoon.

(6)   a. *He greeted me with a warmth.
      b. He greeted me with a warmth that was puzzling.

Kayne (1994: 86) discusses contrasts like (7) and (8), too, in this connection, and notes (1994: 154, fn. 7), as evidence in favour of the D+RC analysis, that definite articles can precede infinitives in Italian. That is relatively weak evidence, since infinitives might be NPs, but definite articles may also precede finite CPs in languages like Spanish, cf. (9), although, as Borsley (1997: 631) notes, the interpretation of the RC is radically different from that of infinitives (and CPs in Spanish examples like (9)):

(7)   a. *The sweater of his was expensive.
      b. The sweater of his that was lying on the sofa was expensive.

(8)   a. *The ones are too expensive.
      b. The ones that you saw are too expensive.

(9)   a. El haber aprobado no te da derecho a exigir nada.
      b. El que apruebes o suspendas me tiene sin cuidado.

However, as Vergnaud (1974) and Jackendoff (1977: 177-182) show in detail, the constraint responsible for (1-8) rather seems to be a general requirement for a phrase of any category that can be interpreted as a restrictive modifier, since PPs, APs, and even prenominal adjectives NOT derived from RCs (e.g., those in 'the old Paris', 'the Paris of my youth', 'the manner of his arrival', etc.) suffice to license the Det in such constructions. Therefore, for consistency's sake, Kayne's analysis should be extended to all D+XP constructions, i.e., cases like 'the Paris of my youth', and 'the manner of his departure' should be derived from underlying D+PPs, and 'the usual warmth' from a D+AP structure, without NP raising in either case.
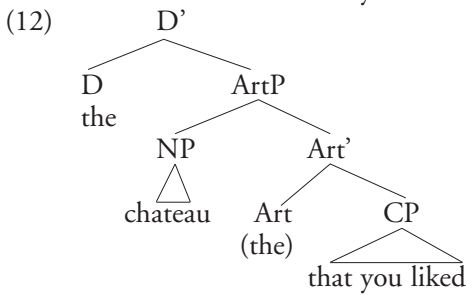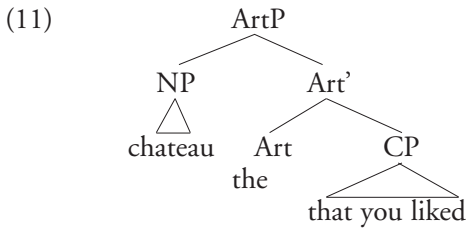
That is not particularly worrying under the XP-Internal Subject Hypothesis if D can select any XP complement, but a problem that does immediately arise under the strict binary branching imposed in Bare Phrase Structure by Merge is that, if the CP is the complement of the determiner, the NP cannot also be a complement, and yet the D does clearly require an overt NP, cf. (10a).

(10) a. *The that you liked is mine.
      b. The chateau that you liked is mine.

This problem does not arise in Kayne's account of RCs, where the NP is not a complement of the Det (although Det must still select a NP elsewhere), but poses a serious difficulty for the widely accepted DetP Hypothesis of Abney (1987), as the ternary branching structure it requires to lodge the two complements of Det (the NP plus the RC, see Abney 1987: 314) can no longer be generated (see Svenonius 1994).

JOSÉ LUIS GONZÁLEZ ESCRIBANO

However, under Larsonian shell-based analyses that appeared shortly after Abney's thesis, the article could still select the RC as a complement and the NP as its specifier, which could correctly generate the DP in (10) from an initial structure like (11) embedded in (12). If D is different from, and higher than articles, demonstratives, and possessives, as Cinque (1994), Kayne (1994) and Bianchi (2000) claim, the ArtP of (11) could itself be the complement of D in a structure like (12), and 'the' raise into D to check the latter's 'phi' features, leaving the NP behind, as desired (N.B.: the trace of 'the' is represented by (the) in (12), in compliance with Chomsky's Copy Theory of Movement).

(11)

```
                    ArtP
             ┌───────┴───────┐
            NP              Art'
            △          ┌─────┴─────┐
         chateau      Art          CP
                      the       ┌───┴───┐
                            that you liked
```

(12)

```
              D'
        ┌─────┴─────┐
        D          ArtP
        the    ┌─────┴─────┐
              NP          Art'
              △       ┌─────┴─────┐
           chateau   Art          CP
                     (the)    ┌────┴────┐
                          that you liked
```

That is not Kayne's approach, though. On the contrary, Kayne, broadly following Vergnaud (1974), assumes that Det takes the CP as its complement and that the NP that precedes the RC at surface structure raises from inside it and lands in its Spec CP, as in (13):

(13)

```
              DP
        ┌─────┴─────┐
        D           CP
        the    ┌─────┴─────┐
              NP           C'
              △        ┌────┴────┐
           chateau    C          IP
                     that     ┌───┴───┐
                         you liked (chateau)
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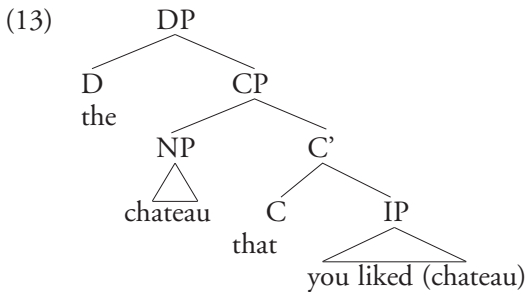
An obvious problem, pointed out in Borsley (1997: 631-3 and passim), is that a bare NP like 'chateau' cannot satisfy the selectional requirements of the verb, cf. (14a). What is needed after the verb is a full referential DP, but, of course, a full

DP cannot raise into Spec CP, or we will obtain the ungrammatical (14b), so since, obviously, the verb's selection features cannot be ignored, some *ad hoc* principle is needed to delete the article of the raised DP or rule it obligatorily empty.

(14)   a. *You liked chateau.
       b. *The the chateau that you liked (the chateau) is mine.

Borsley (1997: 638) also observes that generating a DP like (15) in that way would involve coordinating non-constituents. Under the Art-Raising approach of (11-12) no such problem arises: ArtPs containing Art and their RC complements can be coordinated, take a unique NP specifier, and raise Art into D across the board.

(15)   the picture that Bill liked and which Mary hated

Bianchi (2000: 124-126) concedes that what raises from the RC must be a full DP with an empty D, and offers a principle of 'Economy of Representation' that allows for the abstract 'unification' of the two D's provided their specifications are compatible. However, they are not compatible in ALL cases: whenever the Case of the raised DP and that of the higher D are different, they are arguably not unifiable (e.g., not in (14b), where the lower DP must have an accusative feature, whereas the higher one must be nominative).

Under minimalist assumptions (which Kayne obviously does not share), a second problem is to justify the raising of the DP. Given Kayne's analysis, the NP cannot move into Spec CP for Case-related reasons, but no other triggering factor is suggested, and the movement, therefore, remains questionable on Economy grounds. In her attempt to prop up Kayne's account against Borsley's challenge, Bianchi (2000: 127-8) offers two or three incompatible ideas on this. One is that the DP, according to her assumptions, raises to check the higher D's 'phi' features in a local environment, but the complement domain of the higher D is not a checking domain according to standard assumptions (cf. Chomsky 1995), so she offers a second hypothesis, i.e., that the higher D must bind the open position of the NP. It would follow, then, that what raises is after all an NP, not a DP, and Borsley's selection objection recovers full force, but, even ignoring this, the idea is problematic, for, in that case, granted Minimality, the open position of the NP would have to be bound by the lower D, as Bianchi herself acknowledges before she quickly offers a third reason, i.e., that the higher D has a [+N] selection feature that must be satisfied (Bianchi 2000: 128), and since what has been merged to the D is a CP, the NP must raise from within it and enter the complement domain of the higher D. However, this is also a non-starter, for, even if Spec of CP is local enough, Bianchi forgets that what has raised into it is a full DP (with an empty D), not an NP, and cannot check the higher D's [+N] feature. Thus, since, as Kayne argues, D must generally be prevented from taking DP complements, Bianchi's third hunch does not work either. It must be pointed out, in addition, that the higher D must in other cases select APs, PPs, etc. if Kayne's account of restrictive modification is to stand, as Borsley (1997: 645) notes.

Note that none of these problems arises under the Art-Raising approach sketched in (11-12) above, since Dets plainly select NPs, but not DPs (which explains (14b)), and it is not the NP that raises. What moves is the article, and since the 'phi' features must be available in DP (and therefore in its head D), that movement is plausibly justified in terms of feature-checking: the Art has interpretable 'phi' features that must give values to the uninterpreted 'phi' attributes of D. On the other hand, the number (in other languages also gender and case) agreement between the Art and the NP, which requires additional assumptions under all alternative approaches, now follows without stipulation, since the NP is the Spec of Art, and specifiers must agree with their heads.

Kayne's proposal works somewhat better for wh-relatives, although with the help of extensive movement which is difficult to justify on current minimalist assumptions. According to Kayne, who assumes that 'wh' words are Dets, wh-relative clauses like (16a) are derived via raising of the DP [Which + NP] into Spec CP, followed by further raising of the NP into Spec DP, and cases like (16b) are derived by raising of the PP into Spec CP, followed by raising of the NP into Spec DP and eventually further raising of the NP into Spec P, which yields the observable order, but none of those movements is properly triggered by credible feature-checking needs, and Economy is massively violated.

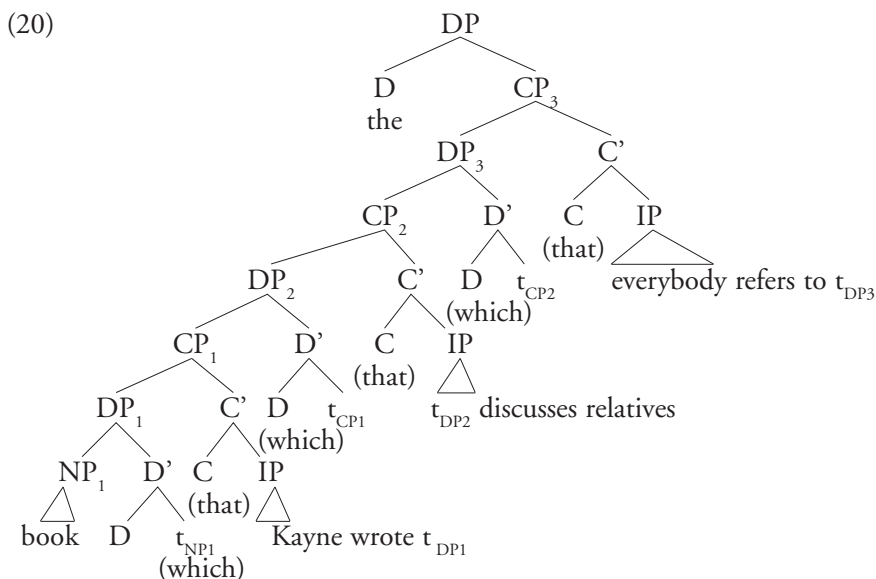(16)   a. the book which I wrote
       b. the book about which I wrote

Furthermore, not all wh-relatives yield to Kayne's analysis. 'Who', 'when', 'where', and 'why' do not. Even if 'who' is a conditioned allomorph of 'which', as Kayne (1994: 154, fn. 12) suggests, and (17a) can be accounted for, cases like (17b-d) are difficult to explain in the same way, since 'where', 'when' and 'why' can hardly be Dets, and certainly do not co-occur with NP complements elsewhere, cf. (18):

(17)   a. the man who invented the wheel
       b. the house where we lived
       c. the time when you could park your car anywhere
       d. the reason why I am here

(18)   a. *Where house did you live in?
       b. *When time could you park your car anywhere?
       c. *Why reason are you here?

Again, note that no such problem arises under the analysis offered in (11-12): 'who', 'when', 'where', and 'why' are not heads, but phrases, and they land in Spec CP, as traditionally assumed. However, a problem that does arise, for both raising approaches, is that RCs can be stacked, as in (19), and it is not clear how such cases are to be handled under either of them.

(19) a. the book that Kayne wrote that discusses relatives that everybody refers to
      b. the book which Kayne wrote which discusses relatives which everybody
         refers to

Under Kayne's approach, as modified in Bianchi (2000), the way to derive (19) is to exploit DP-CP recursion, as shown in (20):
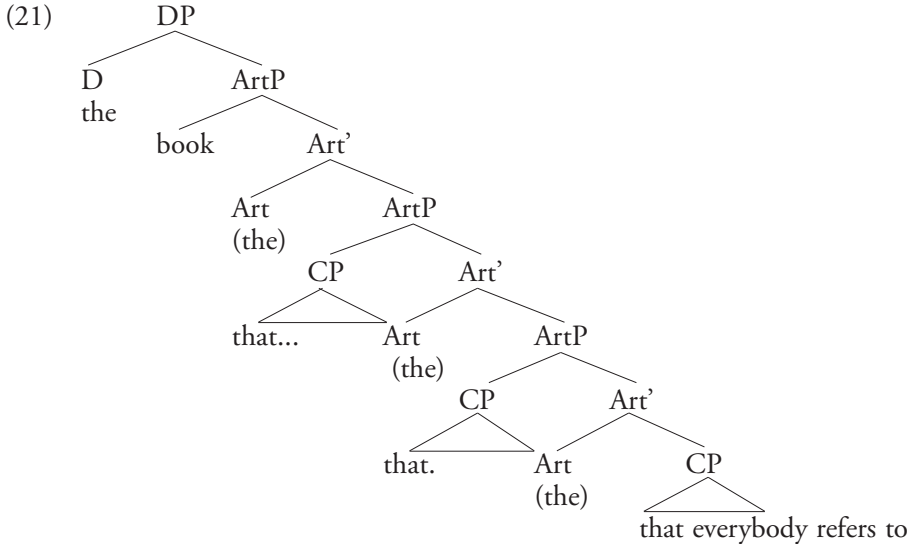
(20)

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                                        DP
                               ┌─────────┴─────────┐
                               D                   CP₃
                              the         ┌─────────┴─────────┐
                                        DP₃                  C'
                                 ┌───────┴───────┐      ┌─────┴─────┐
                               CP₂             D'      C          IP
                          ┌─────┴─────┐    ┌───┴───┐ (that)   ┌────┴────┐
                        DP₂          C'   D    t_CP2   everybody refers to t_DP3
                   ┌─────┴─────┐  ┌───┴── (which)
                 CP₁          D' C    IP
            ┌─────┴─────┐ ┌───┴ (that) △
          DP₁          C' D   t_CP1  t_DP2 discusses relatives
      ┌────┴────┐ ┌──┴ (which)
    NP₁        D' C  IP
     △      ┌──┴ (that) △
   book    D  t_NP1   Kayne wrote t_DP1
         (which)
```

The complement of the D 'the' is the last relative CP (CP₃, in (20)); the DP (DP₃, in (20)) that raises into Spec CP₃ must contain CP2 as its complement and let it raise into its own Spec; CP₂, in its turn, must let DP₂ raise into its own Spec; DP₂ must contain CP₁ as its complement and let it raise into its own Spec DP; finally, a DP (DP₁ in (20)) must raise from inside CP₁ into Spec CP₁, and its NP complement must itself raise into Spec DP₁, as shown in the not very reader-friendly figure (20). The difference between (19a) and (19b) reduces to the fact that the former fills its Cs with 'that' and assumes empty Dets, whereas the latter leaves its Cs empty and assumes Dets filled by 'which'.

That structure and derivation eventually produces the right surface order and the right relative scope of the various RCs, but is far from problem-free. First, for (19a) to be derived, CPs must be selected by empty relative wh-Dets which cannot normally select them when they are interrogative, or the 'doubly-filled Comp filter' must be reintroduced under a new formulation to avoid '*which that' strings, but reformulating the filter would not be an easy matter, for the wh-Det and the C are not in a local relation (see Borsley (1997: 640) for further discussion). Secondly, and more decisively, the multiple raisings required are not well justified. Presumably, a DP headed by 'which' could raise into Spec CP if C is endowed with a suitable [wh] feature in need of checking against that of the wh-DP, and in its turn

the RC complement of a wh-Det could perhaps raise into Spec DP for the same reason, but the raising of the NP into Spec C or Spec D in (19a) and (19b), respectively, is not justified, and the massive pied-piping required is not attested elsewhere.

Under the approach sketched in (11-12), the natural way to handle RC stacking is to allow the ArtP to project multiple Larsonian shells, with the last RC as its complement, and the others as specifiers of successive ArtP shells below that containing the NP specifier, as suggested in (21).

(21)

```
                DP
              /    \
            D       ArtP
            the    /    \
                book     Art'
                       /      \
                     Art       ArtP
                     (the)    /     \
                            CP       Art'
                          /   \     /    \
                       that... Art    ArtP
                              (the)  /     \
                                   CP       Art'
                                 /   \     /    \
                              that.  Art    CP
                                    (the)  /    \
                                          that everybody refers to
```

That is the approach to modification defended for at least post-verbal adverbials in Larson (1988), and directly yields the observable surface order without any movement at all, but it poses its own problems: a) the constituent structure it assigns to the DP runs afoul of all the standard constituency tests, and b) the scope of the various modifiers is all wrong.

Note, in the first respect, that One-Pronominalization works as expected of anaphoric processes only if 'book', 'book that Kayne wrote', 'book that Kayne wrote that discusses relatives', and 'book that Kayne wrote that discusses relatives that everybody refers to' are constituents, cf. (22), whereas, according to (21), none of those sequences is a unitary constituent.

(22)   a. the book that Kayne wrote that discusses relatives that everybody refers to
        b. the one that Kayne wrote that discusses relatives that everybody refers to
        c. the one that discusses relatives that everybody refers to
        d. the one that everybody refers to
        e. that one

As to the scope problem, the obvious antecedent of 'that everybody refers to' is no less than the sequence 'book that Kayne wrote that discusses relatives', but
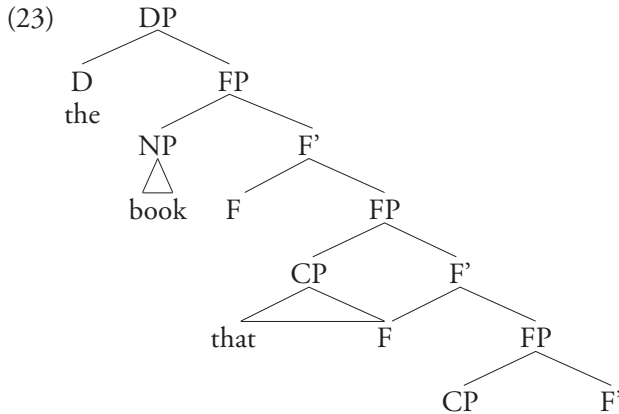
the former clause does not c-command such a sequence in (21) (although it did in the Kaynean structure of (20)), and therefore unless there is *ad hoc* LF Adjunct Raising (LFAR, hereafter) to restore the right scope to the modifiers before the structure is interpreted, the semantic interpretation will be incorrect (see Ernst 2002: ch. 4 on further problems connected with LFAR in the parallel case of adverbial modifiers).
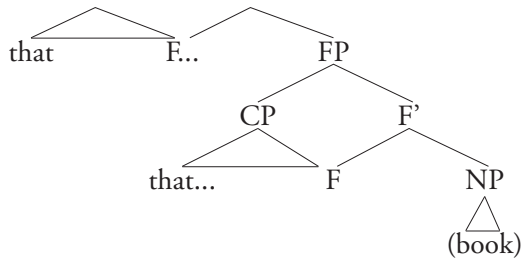
In sum, two modern versions of Smith's D+RC hypothesis have been examined in this section, Kayne's, as revised in Bianchi (2000), and the Art-Raising variant thereof. The former, illustrated in the structure and derivation of (20), accommodates the facts of constituency and scope, but raises a host of selection mismatches pointed out in Borsley (1997) and requires massive unjustified movement in violation of Economy. As to the Art-Raising D+RC variant illustrated in (11-12)-(21), it raises none of those technical problems, but clearly runs afoul of the constituency and scope facts unless the structure is reconstructed by LFAR or similar rules before it is interpreted at LF. Rather than accept any of those unsatisfactory solutions, it is reasonable to consider possible alternatives.

1.3. CINQUE'S SPECIFIER THEORY

Cinque's theory of modifiers as specifiers of hierarchically ordered functional heads (Cinque 1994, 1999) has not, as far as I know, been explicitly extended to RCs, but there is no other reasonable way to handle them within his system, and it is relatively straightforward to figure out what such a theory would look like and the basic details and consequences of an analysis of that kind.

Assuming that RCs are specifiers of functional heads situated above the NP, just as adverbial modifiers c-command the VP at initial structure, a DP like (22a) could under Cinque's assumptions have a derived structure like (23). The dots indicate possible additional structure lodging further specifiers (PPs, APs), (book) stands for the lowest copy of the raised NP, and, for simplicity's sake, only the final landing site of the NP is shown.

(23)

```
            that        F...        FP
                              CP          F'
                        that...       F      NP
                                            △
                                          (book)
```

Of course, there is a lot of perfectly unjustified structure in (23). Contrary to what happens in Larsonian analyses, in which the lexical head raises through the various functional heads above, nothing raises through the F-heads of (23), and nothing overt ever fills them. They presumably contain features of some kind, but they have not been specified, and, anyway, whatever they are, there is no reason, in principle, why they should not be attributed directly either to the NP or to the CPs themselves. Thus, the only justification of the various F-heads in (23), as of parallel ones in the VP system, is that they supply the specifiers needed to maintain the analysis of modifiers, RCs in this case, as specifiers: a perfectly circular one. But that is not the only *ad hoc* structure such an analysis requires: since the NP must eventually precede all RCs, but also follow all head-final APs, it will have to be raised from below the functional structure into another *ad hoc* Spec F somewhere between the leftmost RC and the Det, and, since such raisings must obey Minimality, new *ad hoc* F-heads and specifiers (represented by dots in structure (23)) will have to be interspersed with the F-heads that accommodate the RCs to lodge the NP as it ascends.

The Cinquean analysis also creates Economy problems here. As in the parallel case of VP modification, the ascension of the NP requires a suitable trigger feature that, to my knowledge, has never been specified. What Cinque (1999) proposes in the case of verbal modifiers is that the VP raises in order to land in a position from which it becomes a structural 'subject' of sorts with respect to such 'predicates', but a) the NP/VP, NP in the case at hand, does never land in a proper subject-predicate configuration, since the RC is not the complement of F, but the Specifier of a lower FP, and b) the whole idea is implausible, since neither the VP nor the NP need raise high enough, i.e., the VP may remain below many adverbs, and, in the case under discussion here, the NP must remain below head-final APs that should also enter predication relations with the NP if Cinque's motivation for NP-raising were correct. Thus, no real functional explanation is offered for VP/NP-Raising, and derivations like (23) will massively violate Economy.

Finally, it is clear that the constituency and scope problems noted in Kayne's proposal will arise for a theory that attributes to DPs with stacked RCs a structure like (23), i.e., a) the constituents [NP], [NP+RC], [[NP+RC]+RC], etc. required to account for the substitutions of (22), as well as operations of ellipsis, coordination etc., are not defined as such in (23), and b) the CPs that should have scope over them do not, for, granted Cinque's Kaynean assumptions on antisymmetry, for each RC, being later in the observable surface order amounts to being lower in the

structure, and therefore unable to take scope over what precedes. As a consequence, (23) is all wrong, and like our Larsonian tree above, must be reorganized by LF Adjunct Raising before it is interpreted (see Svenonius 1994 on a parallel problem with adjectives, and Ernst's excellent discussion in Ernst (2002: 191-205)).

In sum, pace Cinque, under close scrutiny, a specifier analysis of RCs along Cinquean lines is even more stipulative and more problematic, conceptually as well as empirically, than the Kaynean D+RC one or the Larsonian variant thereof discussed above, and there are good reasons to consider more traditional alternatives.

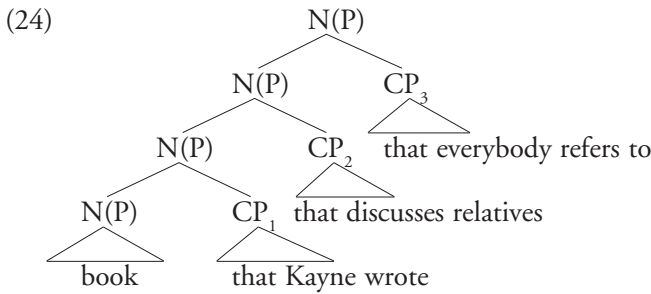## 1.4. ADJUNCTION THEORIES OF RCs

The traditional TGG doctrine on RCs is that they are 'adjuncts' of various nominal projections. Thus, Partee (1975), Jackendoff (1977), Stowell (1981), Gazdar et al. (1985), Rothstein (1988), Fabb (1990), Sag (1997), McCawley (1981, 1998), or Heim and Kratzer (1998: 86-115) attach restrictive RCs to recurring N' projections, with noun complements under N' and non-restrictive RCs above N", whereas Ross (1986), Chomsky (1977, 1981, 1986), McCloskey (1979), Williams (1980), Cinque (1982), Safir (1986), and late P&PT analyses like Lebeaux (1991), Chomsky and Lasnik (1993), González Escribano (1995), etc., consider RCs adjuncts of maximal NP (or DPs, under Abney's theory). Although there are multiple differences of detail among them (see discussion in González Escribano 1995), what is primarily of interest here is that they all see RCs as 'adjuncts' (i.e., predicates), rather than complements or specifiers, and that they must express whatever dependencies may exist between Dets and RCs in terms of binding constraints between the Det and the RC (see, e.g., Jackendoff (1977) and Rothstein (1988)).

The analysis of RCs as 'adjectival' predicates is common in traditional grammar, as in logic and philosophy of language since at least Quine (1960: 110-112), and is adopted in Jackendoff (1977), Chomsky (1977), Williams (1980, 1994: 8), Fabb (1990), Heim and Kratzer (1998: 86-88), etc., although the semantics is technically understood in at least two different ways. One, which ultimately draws on Fregean doctrine and sees Function Composition in such cases, is found in Quine (1960), Montague (1974), Higginbotham (1985), Fabb (1990), Williams (1994: 44-45, 91-94), and Partee (1995: 325-330), and claims that the RC (CP1 in (24)) is a second-order predicate that takes its NP sister (itself a first-order predicate) as its 'subject' and yields a composite first-order predicate to which the RCs in CP2 and CP3 subsequently apply in the same fashion, transparently, in the sense that any unsaturated argument of the NP remains unsaturated in the resulting composite and must be discharged via Higginbotham's 'Theta Binding'. Another, inspired by Davidson's (1967) treatment of adverbial modifiers, is based on predicate conjunction (although Heim and Kratzer's (1998: 88) misleadingly dub it 'Predicate Modification') and on Higginbotham's (1985: 563-565) 'Theta Identification': both NP and RC are one-place first-order predicates, and their external arguments are first theta-identified (= unified), and then passed up and jointly discharged by the Determiner under Higginbotham's Theta Binding. Technical issues concerning the

type of RCs, however, are of marginal interest here, since the syntactic realization is identical, but, obviously, maximum generality and simplicity, as well as a better account of non-intersective modification, is achieved if restrictive modification is function composition, and we shall therefore assume it is, although nothing in the solution proposed here hinges on this choice.

Adjunction theories directly achieve *via* base-generation what Larsonian, Kaynean or Cinquean theories must derive by means of *ad hoc* functional structure and questionable movements, i.e., the right constituent structure that standard tests like substitution in (22) indicate exists and the right scope of the rightmost RC over preceding postmodifiers. Under any adjunction theory the structure of (22a) will look like (24) *modulo* the choice between N' and NP (or DP) as the relevant sites of attachment, the right surface order follows under standard tree-structure conventions (i.e., the No-Crossing Constraint) and the semantics predicted is structure-dependent, compositional, and right.

(24)

```
                         N(P)
                 _____|_____
               N(P)            CP₃
          _____|_____    _____|_____
        N(P)        CP₂   that everybody refers to
     ____|____   ____|____
   N(P)     CP₁  that discusses relatives
 ___|___  ___|___
 book    that Kayne wrote
```

To my knowledge, nothing decisively damaging has ever been said against adjunction theories of modification. The current tendency to question the existence of adjuncts is largely based on the desire to constrain the options at UG, but it should be borne in mind that simplification can be achieved either by reducing adjuncts to specifiers or by reducing specifiers to adjuncts (as Kayne does). Note, furthermore, that specifiers hardly constitute a well motivated uniform category, for in Larsonian-Kaynean-Cinquean theories they indistinctly lodge complements, subjects, modifiers, and operators of various types. That is consistent with Davidsonian semantics as developed in e.g., Parsons (1990), which reduces all subsentential constituents to predicates of the event variable (and, correspondingly, all sub-NP constituents to predicates of the individual variable associated with nouns by Higginbotham (1985) and Williams (1994)), but the substantial semantic differences that exist between complements and modifiers are obliterated under the Cinquean 'everything-in-Spec' approach, a questionable move for a structure-dependent theory of syntax and semantics to take, whereas adjunction theories do preserve a neat structure-dependent distinction between arguments and modifiers.

The direct and uniform correlation between hierarchical structure and surface order that follows from Kayne's antisymmetry approach in virtue of the LCA obviously does not follow as elegantly from adjunction analyses like (24), where both pre-nominal (e.g., Adjectives, Quantifiers, Articles, Determiners) and post-

nominal elements (e.g., PPs, RCs) c-command the N(P), but it is still accurate to say that, granted the No-Crossing Constraint on P-markers and the resulting onion-like structure it imposes on multiply modified heads, word order can be predicted from hierarchical structure, although in a less elegant, disjunctive way, by the statements in (25):

(25) 1. A pre-modifier that c-commands another precedes it.
      2. A post-modifier that c-commands another follows it.

However, that loss of elegance of statement can be improved upon. As we shall see in 2, under slightly different bare phrase structure assumptions, what is essentially an adjunction theory of modification can preserve all the advantages of the adjunction analyses with respect to constituent structure, scope, straightforward compositionality, and surface order, and still derive the latter from Kayne's LCA without any of the technical disadvantages of Larsonian, Kaynean or Cinquean analyses. In other words, Kayne's antisymmetric approach to word order and adjunction theories of modification, including RC modification, can be reconciled, with substantial advantages, under the theory proposed in González Escribano (2004).

2. A NEW THEORY OF RELATIVE CLAUSES

2.1. PHRASE STRUCTURE AND MODIFICATION

Syntax is largely a matter of satisfaction of the selection features of linguistic objects, ultimately lexical items, *via* Merge (see Chomsky (1994, 1995, 1998)). The presence of an unsatisfied selection feature in a syntactic object automatically converts it into a potentially 'active' node (cf. the concept of 'locus' in Collins 1999). Such a feature launches a search through the derivation's working space for a suitable object that may satisfy it, and satisfaction triggers Merge.

Since Merge can only satisfy one selection feature at a time and an active object may contain more than one, satisfaction may take as many searches and mergers, and some selection features must 'wait' while others are being satisfied. This implies that selection features are ranked, as assumed in various ways in all generative theories of syntax (e.g., a 'cancellation' order in CG, Obliqueness Hierarchies in RG, LFG, HPSG, the Thematic Hierarchy in P&PT, the order of embedding of events and their characteristic arguments in lexical theories like Hale and Keyser (1993, 2002), Rappaport and Levin (1998), Alsina (1999), etc.). Let us refer to this hypothetical property of the computational component as the *Priority Constraint* (just 'Priority', hereafter). Priority and Merge create the asymmetry between 'complement' and 'specifier' in X-bar theory, which, in order to avoid unwanted polysemy and vacuity in the current use of the term 'specifier', will be referred to here by the terms 'complement 1' and 'complement 2' ('C1' and 'C2', hereafter). Since only one syntactic object can be merged as a C1 of X, if X already has a C1, any new complement will have to be merged to it as a C2, and, assuming Kayne's

LCA, C2 will asymmetrically c-command and precede X and its C1 at the P interface. The [C2 [Head C1]] shell is all the structure a head can license. Three-place predicates, therefore, require the projection of two shells: the head raises, takes the lower shell as its C1 and licenses a new C2 where the third argument is attached.

The gradual nature of satisfaction *via* Merge poses the issue whether all selection features of a head must be satisfied in a continuous sequence. Let us call this second hypothetical property of the computational component (= CHL) the *Immediate Saturation Constraint* (ISC, hereafter). Late P&P (e.g., Chomsky (1986), Sportiche (1988), Speas (1990), Chomsky and Lasnik (1993)) and early minimalist theory have clearly assumed ISC (e.g., by claiming that selection features are 'strong', as in Chomsky (1995)). As a consequence of ISC, an active syntactic object can never be targeted for the satisfaction of selection features of another active head, and, by definition, active objects are always unsaturated, whereas goals are always saturated and inactive by the time they merge to their selecting heads. ISC diminishes memory load and presumably simplifies computation, but there is evidence that CHL does not work that way, for modifiers can be attached to intermediate projections, and it will not be assumed here (see, e.g., Jackendoff (1977), Hornstein and Lightfoot (1981), Andrews (1982, 1983), Gazdar et al. (1985), Radford (1988), Baker (1995), Pesetsky (1995), Bowers (1993, 2001), McCawley (1998), Haegeman and Guéron (1999), etc.). On the contrary, in certain mergers BOTH constituents are unsaturated (although only one is active with respect to the merger under way), i.e., against the standard view, functional composition is possible in this theory of the CHL.

Subject to Priority, Merge applies to an active node A and a suitable goal B, deletes the selection feature —B in the active node, yields a set containing A and B with all their surviving features (and sets) adding nothing (i.e., Inclusiveness is preserved), and makes the 'label' of either A or B asymmetrically project onto the resulting set (cf. Chomsky (1995: 244)).

Whether A or B projects depends on the kind of merger. According to Chomsky (1998: 133-134, 2001: 18), it is necessary to distinguish two types of Merge, with different properties. In cases of Set Merge, which is a) driven by feature-checking, b) obligatory, and c) non-directional, the goal satisfies one of the arguments of the active node, which projects its label. On the contrary, Pair Merge, which merges modifiers to their modifieds, is a) not driven by feature-checking needs, b) optional, and c) directional, in the sense that the modifier is merged TO a modified, which projects.

That disjunction, however, is obviously a theoretical 'imperfection' that from a minimalist perspective should be eliminated if possible, and my claim is that it can be eliminated. The present approach differs from Chomsky's in that it considers Merge a unified operation with the properties Chomsky attributes to Set Merge, i.e., it is feature-driven, obligatory, and non-directional.

As stated, modifying heads, i.e., adjectives, adverbs, prepositions, and complementizers containing relativization operators are predicates with their own argument-structure and selection features. As soon as a modifier becomes a member of a lexical array and enters a derivation, its selection features must be satisfied

just as obligatorily as those of any other head, so the operation that merges a modifier with its modified is also driven by feature-satisfaction, and obligatory. The modifier's head is active in that case, and its goal, the modified, is also its selected argument: adjectives and relative operators select nominals (see Higginbotham (1985: 564-5) on 'autonymous theta marking'), adverbs select verbal projections, and prepositions may select either. Thus, the differences in functional motivation or obligatoriness vs. optionality between the two cases are illusory, and there is no reason to distinguish two types of Merge.

The difference that Chomsky notes between cases of complementation (= his Set Merge) and modification (= his Pair Merge) as to the pattern of projection of labels exists, but does not follow from the intervention of two different combinatory operations, but from Predication Theory (see Williams (1980, 1994)): since only one argument (and, granted Priority, only the last one) may be satisfied externally, in cases of modification, no matter whether the modified is C1 or C2, after the modifier merges with its modified its head becomes fully saturated and ceases to be 'active'. On the contrary, the modified remains unsaturated until further arguments are discharged (typically the higher ones, i.e., the subject and the R or E arguments of NPs and VPs), and therefore must also remain active, projecting its label. NP and VP projections are closed and finally become inactive only when their R(eferent) or E(vent) argument, respectively, is Theta-Bound by Tense or D (see Williams (1981, 1994: 34, 51-52) on the R argument in nominals, Davidson 1967 and Parsons 1990 on the E argument in VPs, and Higginbotham (1985: 560) on thematic discharge *via* Theta Binding).

The relevant general principle that unifies Merge is (26), and the crucial fact about modification is that modifiers do NOT remain unsaturated after they merge to their modifieds.

(26)   Labelling Principle (LP):
       An object that undergoes Merge and remains unsaturated projects its label.

Under the present theory of Merge, thus, modification reduces to complementation. What we call a 'modifier' of X is just an independent syntactic head M available in the system's 'working space', constructed, under Priority, according to its own selectional requirements, and 'modification' is the process by which another syntactic object X becomes the 'goal' of M's head and gets merged to M as either a C1 or C2, depending on the previous derivational history of M, with a selection feature of the head of M satisfied as a result of the operation.

'Adjuncts', in other words, do not exist, according to the present theory, a welcome result if tenable, since they have never fitted well in X-bar theory and major statements of the latter such as Chomsky (1967, 1986) did not even provide for them. The idea that they inhabit some 'parasyntactic' space has been around since at least Lebeaux (1988), (1991), and Speas (1990), but it conflicts with the robust intuition that modifiers contain predicates which require arguments. The present theory, thus, strongly objects to viewing modifiers as in any sense marginal to, disconnected from, or late additions to the 'main' computation. On the con-

trary, it claims that modifiers are fully integrated into the derivation, and in the strongest possible way, via obligatory complementation relations: since the selection features of ALL heads must eventually be satisfied, modifying heads are as subject to satisfaction via Priority and Merge as any other predicate.

Crucially, the basic [C2 [Head C1]] geometry of phrases induced by Priority, Merge, and the LCA must also be satisfied around EVERY head in a tree, including the modifier's. Thus, a goal G will be merged with a modifier M as its C1 or C2 depending on the previously assembled structure of M. Since, granted Inclusiveness, no vacuous structure can be built (i.e., structure is built 'on demand', as fixed by selection features of lexical items), the first complement to be merged with M is necessarily its C1, and the second is its C2, which, granted Kayne's LCA, will c-command and eventually precede the head of M and its C1.

The basic structures and linearizations our theory generates in cases of modification, thus, are (27), where M is a one-place predicate, takes C1 as its only complement, ceases to be active as a consequence of Merge, and C1 [Cat:X] projects, and (28), where M is a two-place predicate, merges with C1, remains active, merges with C2, ceases to be active, and therefore the still active C2 projects. On the contrary, structures like (29) and (30) violate the LCA and do not occur in well-formed derivations.

(27) [Cat: X]
    M[Cat:Y] C1[Cat:X]

(28) [Cat:X]
    C2[Cat:X] M [Cat:Y]
              M [Cat:Y] C1 [Cat:Z]

*(29) [Cat:X]
    C1[Cat:X] M [Cat:Y]

*(30) [Cat:X]
    M[Cat:Y] C2 [Cat:X]
            M [Cat:Y] C1[Cat:Z]

Let us now see how (27-28) apply to the core cases of modification of nominals. For attributive adjectives, independently of their adicity and argument structure (unergative, as in 'active woman', unaccusative, as in 'shiny car'), the nominal is invariably realized as a C1, so the relevant syntax is (27). The only way to keep the second (and lower) argument of an attributive adjective is to incorporate it as the first term of a compound, e.g., 'tax' in (31).

(31) tax-free (shop)

In the case of passive participles (e.g., 'automated procedure'), the nominal they select corresponds to a deep object, and (27) indeed places it in C1, the ca-

nonical position for Themes. As in the case of adjectives, a second argument or modifier can be kept only if incorporated into a compound (cf. 'computer-designed furniture', 'well-designed furniture', etc.).

The nominal selected by active participles (e.g., 'attending students'), on the contrary, corresponds to their highest argument, but all 'lower' ones must be suppressed (or, again, incorporated to the head, cf. 'oil-producing countries'), and, since vacuous structure is illicit, the NP is also realized as the C1 of (27). Note that (32) would instantiate structure (30), violating LCA.

(32)   *attending the course students

Adjectives and participles accompanied by a syntactic C1, on the contrary, must crucially take their selected NP as a C2 and follow it, as in (28), yielding the 'predicative' construction, cf. (33):

(33)   a. a student keen on jazz/*a keen on jazz student
        b. a box containing his belongings/*a containing his belongings box
        c. the job offered to Bill/*the offered to Bill job

If the modifier M is itself modified by another predicate P, M will be merged to P as a C1 or C2 depending on the previous structure of P, as determined by Priority. Thus, in (34), 'since' already has a C1 when it merges with 'keen on chess' and therefore treats 'keen on chess' as its C2 and precedes it, and 'keen on chess' itself already contains a C1, so, when Merge satisfies its second selection feature, 'boy' becomes its C2, which, again, canonically precedes the adjective.

(34)
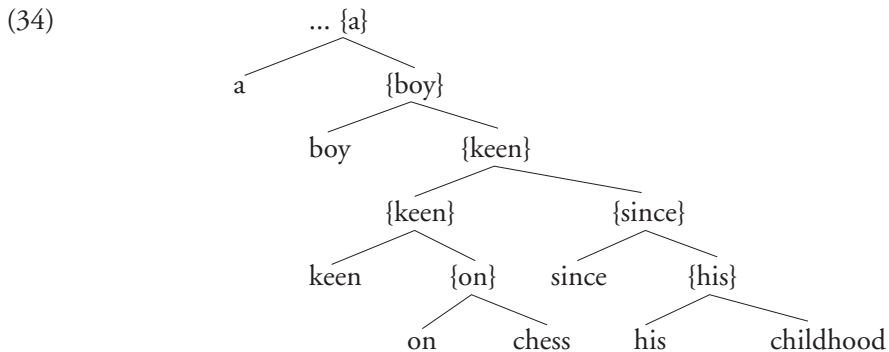
Note that the PP 'since his childhood', not being an argument of 'keen', does not become its C2. As a consequence, 'keen' remains active, and its C2 slot available to be occupied by a proper argument, in this case the NP 'boy'.

PPs modifying nominal projections are headed by two-place prepositions with selection features requiring certain kinds of nominals as their C1 and C2. By the time they are attached to the NP, Priority has forced them to take a C1 and the NP must be attached to them as a C2, so the analysis of 'predicative' APs (i.e.,

structure (28)) is straightforwardly applicable to them. It follows, correctly, that PP modifiers never precede nouns.

More generally, a nice consequence of the present approach to modification is that mysterious constraints like Emonds's (1976, 1985) 'Surface Recursion Restriction' or Williams's (1982) 'Head Final Filter', necessary to block examples like (35), become entirely redundant.

(35) a. *a [$_{AP}$ keen on jazz] student
      b. *Bill's [$_{DP}$ this morning] lecture
      c. *a [$_{PP}$ near Boston] residential area
      d. *a [$_{VP/IP}$ containing documents] briefcase
      e. *a [$_{VP/IP}$ concerned with social welfare] politician
      f. *a [$_{CP}$ which I published in 1991] book
      g. *a [$_{DP}$ this week] available book
      h. *a [$_{NP}$ Monday morning] available book
      i. *a [$_{QP}$ several years] available book
      j. *an [$_{PP}$ at our library] available book
      k. *an [$_{ADVP}$ independently of the situation] available book (etc.)

Granted Priority, Merge, LCA, and Predication Theory as interpreted in the present theory, the correct distribution of modifiers with and without internal complements follows without stipulation (see González Escribano (2004) for details on many more HF effects and unexplained absence thereof throughout the grammar and the way they derive from present assumptions).

2.2. RELATIVE CLAUSES AS PREDICATES

At first sight, RCs present a technical difficulty for the present approach in that, whereas AP, AdvP, participial VP, and PP modifiers have an obvious C2 gap in their syntactic structure for the modified nominal to fill, RCs are CPs often with an overt *wh*-XP in Spec C, which makes it implausible to treat the modified NP as the C2 of their C, as the present approach would seem to require in order to explain their syntax and position with respect to the nominal. As Williams (1994: 8) notes, a RC dominates a full IP, and IP is a thematically self-contained (i.e., saturated) domain, so no theta role of its internal predicate(s) is satisfied by the merger with an 'antecedent' NP, and he concludes that the NP-RC relation is an 'adjunct juncture'.
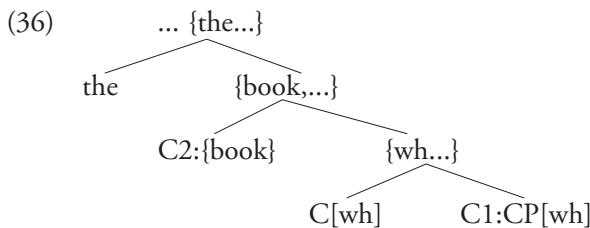
Notice, however, that the *wh*-XP that fills Spec C reaches that position *via* Move and is NOT a complement of C. Thus, no selection feature of C is satisfied by the landing of the *wh*-XP in its specifier (a general property of Move, which is never triggered by the satisfaction of selection features, see Chomsky 1995). Only the strong [wh] feature of C is checked. On the contrary, the nominal antecedent of the relative head must be a subject of the RC, for the latter is semantically interpreted as a one-place predicate, as Quine (1960: 110-112) and almost everybody else since
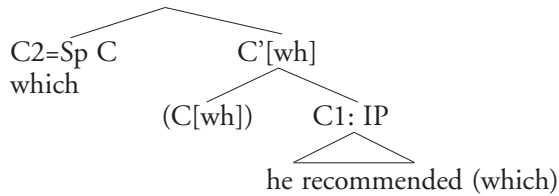
has assumed. But how can the nominal be a subject of the RC if it is not in C2 of C and that slot is occupied by a non-subject?

What makes a RC interpretable as a predicate is the strong [wh] feature of its C, which has the capacity to turn a fact into a property predicable of a set (denoted by the nominal antecedent). Thus, semantically, C[wh] is a two-place function of type <t <<e,t>,<e,t>>>, and syntactically it c-selects an IP and a nominal as its C1 and C2, respectively.

On the other hand, what makes RCs different from other modifiers, is that their head C[wh], apart from having two selection features that must be satisfied, also contains the strong feature [wh] which must also be licensed by a *wh*-XP with a suitable [wh] feature *via* checking. Strong features do not 'wait', and as a consequence, a *wh*-XP lands in the checking domain of C, i.e., C2 of C, and checks [wh] off. However, since the *wh*-XP is not an argument of C[wh], it does NOT satisfy its second selection feature, which must still be satisfied, so, after the first C-shell is completed, the C[wh] head raises above it and projects a new C-shell where the low CP shell occupies C1. That C-shell supplies a new canonical C2 position in which the required complement (a 'subject') can be merged, and the antecedent nominal provides it. Thus, RCs are, after all, completely parallel to PPs (as Emonds (1985) claimed), APs, and all other modifiers with C1s, except that the strong [wh] feature in their C interrupts the saturation of C and causes *extra* shell structure at the top of the RC.

Figure (36) shows how this works (traditional category symbols C, CP, IP are used along with standard minimalist labels to indicate where the [wh] feature is with respect to CP and the nominal antecedent). In (36), 'book' occupies the C2 position of the higher C-shell, i.e., the position of the specifier of standard X-bar theory, and agrees with its head, the higher C[wh], in its 'phi' features (number, gender, and person). As the higher copy of C[wh] must form a uniform chain with the lower one, the latter also agrees with the nominal in its 'phi' features, as well as with its own specifier, the *wh*-DP 'which', and this, in its turn, finally must form a uniform a chain with its own traces. In this way, the agreement between the 'antecedent' nominal, the *wh*-DP, and the copies of the latter, follows from standard principles of trace binding. Obviously, the correct surface order 'the book which he recommended' and scope also follow without any of the *ad hoc* expedients adopted in the Larsonian-Kaynean-Cinquean solutions earlier discussed. As to the former, since the nominal 'book' is the C2 of the higher C, it asymmetrically c-commands and eventually precedes C and the whole RC, correctly, since in English RCs always follow the nominals they modify.

(36)

```
              ... {the...}
         /              \
       the           {book,...}
                   /            \
            C2:{book}          {wh...}
                            /           \
                      C[wh]          C1:CP[wh]
```

```
                          C2=Sp C              C'[wh]
                          which
                                          (C[wh])    C1: IP
                                                   he recommended (which)
```
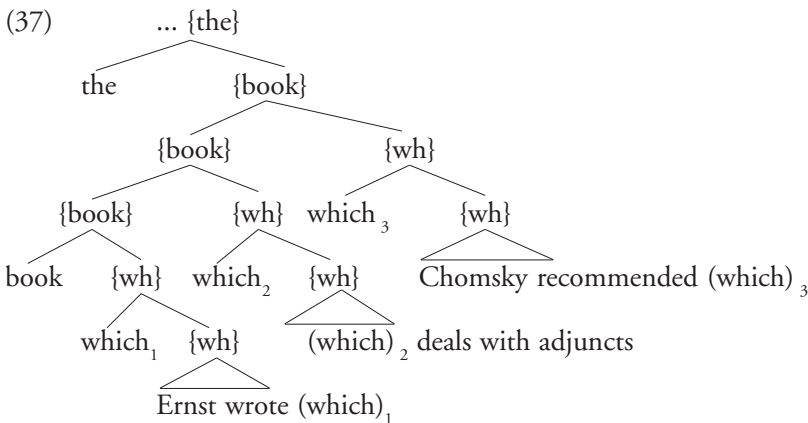
In cases of stacking, a nominal modified by a RC will become the C2 of the higher C-shell of the following RC, and so on until the last RC is reached. The last RC will thus have the nominal modified by *n* RCs as the C2 of its own higher C-shell, and of course will follow it.

The advantages of this approach over its Kaynean-Cinquean competitors as regards the assignation of scope to multiple modifiers and stacked RCs are obvious. It yields mutual c-command (sisterhood) between each higher shell C' and its C2. C' being a sister of its C2, it c-commands it and has it in its sope, but the C2 is still a specifier of C, asymmetrically c-commands the constituents of C', and therefore precedes them. Similarly, later RCs will always be sisters and c-command the nominals they modify. As these dominate Nom+RC structures containing previous RCs, the last RC is a sister to the biggest nominal and also has widest scope, as desired.

In (37) (some details omitted to enhance readability), therefore, 'which$_1$' agrees with and refers back to 'book', but 'which$_2$' refers to 'book which Ernst wrote', and 'which$_3$' refers to 'book which Ernst wrote which deals with adjuncts', as desired.

(37)

```
                  ... {the}
          the            {book}
                   {book}           {wh}
              {book}    {wh}   which₃    {wh}
         book   {wh}  which₂  {wh}    Chomsky recommended (which)₃
            which₁ {wh}   (which)₂ deals with adjuncts
              Ernst wrote (which)₁
```

In (37):
- the
- {book}
- {book} / {wh}
- {book} {wh} which $_3$ {wh}
- book {wh} which $_2$ {wh} Chomsky recommended (which) $_3$
- which $_1$ {wh} (which) $_2$ deals with adjuncts
- Ernst wrote (which) $_1$

In sum: RCs, far from being a counterexample to the theory of phrase structure and modification defended in González Escribano (2004) and this paper, behave exactly as predicted. Their constituent structure, linear order, scope properties, and semantic interpretation as one-place second-order predicates all follow straightforwardly from what the theory predicts.

3. CONCLUSION

Empirical success in this traditionally complex area of modification, as well as in directly predicting head-final effects (cf. (35)) and absence thereof (see details in González Escribano (2004)), in avoiding tension between the consequences of the XP-Internal Subject Hypothesis and those of Predication Theory in cases of modification (see González Escribano (1998)), and, above all, the fact that the present theory reduces all modification to complementation, eliminates adjuncts, unifies Chomsky's two cases of Merge simplifying computation, and leads to a transparent relation between syntax and semantic interpretation, all constitute strong and converging evidence that it is on the right track, and interestingly: it achieves all that while keeping quite in the spirit of simplification of the CHL of I-Language that characterizes Chomsky's minimalist program.

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