

Chapter 4: Relativization --- Head-initial relative constructions

Relative constructions¹ have received a great deal of attention in recent years largely due to Kayne's (1994) revival of the "promotion analysis" of relative constructions, in contrast to the prevailing "*wh*-movement analysis" assumed since Chomsky (1977). The promotion analysis was originally proposed by Schachter (1973), who also cited unpublished work by Brame (1968) and Vergnaud (1974). An early form of the *wh*-movement analysis was labeled the "matching analysis" by Schachter (1973), referring to an analysis whereby the derivation of a relative clause involves the deletion of a nominal expression in the relative clause under identity with the base-generated Head (see Lees 1960, 1961, Chomsky 1965; Kuroda 1968; see also Montague 1970, Partee 1975 and see Vergnaud 1974 for an extensive review and list of references).

Although the two lines of analysis have been pursued, it has widely been assumed that one of the two analyses suffices (cf. Carlson 1977, Grosu and Landman 1998). However, a detailed investigation of restrictive relative constructions reveals the need to distinguish different types of relative constructions within one language as well as across languages. This state of affairs can be accommodated only if both analyses are adopted.

Different empirical generalizations exist for different types of relative constructions. More precisely, relative constructions differ as to whether the Head of a relative construction can be reconstructed. For instance, LA distinguishes between definite and indefinite relative constructions. The two differ in the availability of reconstruction: the Head can be reconstructed in a definite relative but not in an indefinite relative. To a certain extent, the same contrast is found between English relative constructions containing a *wh* relative pronoun and those without: the former construction does not allow reconstruction but the latter does. Such a contrast in reconstruction suggests that (i) in cases where reconstruction of the Head is available, the Head of a relative construction can be derived by movement and (ii) in cases where reconstruction is unavailable, it cannot be derived by movement of the Head (i.e., it must be base-generated). Nonetheless, we show that even in relative constructions which do not allow reconstruction of the Head (lack of reconstruction), important empirical generalizations exist that require an analysis according to which operator movement applies to derive these constructions. This argues for the adoption of a *wh*-operator movement analysis (the matching analysis referred to above). This suggests that relative constructions have to be distinguished into (i) those allowing reconstruction derived by movement of the Head (the promotion analysis), and; (ii) those not exhibiting reconstruction of the Head, which are derived by base-generating a Head and moving a relative operator (the operator movement (matching) analysis). In addition, in cases where movement is not available at all (either raising of the Head or movement of the operator), such as in island contexts where a "true" resumptive pronoun occurs, base-generation must also be available. In other words, three strategies are available to derive relative constructions: the promotion analysis, the operator movement analysis and base-generation.²

¹ We will concentrate on restrictive relative constructions and briefly discuss amount relatives in this work, leaving other types relatives, such as appositives, aside. For detailed studies of appositives, see Ross (1967), Emonds (1979), Demirdache (1991) etc. In these works, an appositive is not part of the clause containing the Head of the appositive (for instance, a coordination structure is involved. Also cf. the "discontinuous constituent" approach of McCawley (1982).

² The third option, base-generation, is clearer and forced by the non-availability of movement. We will focus on the first two options in this chapter.

It will further be shown that it is not a matter of free choice to derive a relative construction by raising the Head or base-generating the Head (which involves an operator movement; see note 2). The option of raising the Head of a relative construction, in which case reconstruction effects are exhibited, is dictated by the possibility of having a DP in the Head position with a properly licensed empty determiner. The adoption of both the promotion analysis and the matching (operator movement) analysis not only satisfactorily captures variations concerning reconstruction in different relative constructions but also provides more appropriate phrase structures for relative constructions that dispense with some morphosyntactic problems inherent to the earlier analyses.

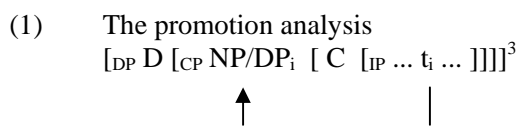
We will first sketch the main arguments for the two lines of analysis (promotion and operator movement) in section 4.1 in order to pave the way for the determination of whether a particular analysis is adequate. The existence of different empirical generalizations, especially with regard to reconstruction possibilities of the Head in LA definite and indefinite relatives, will be presented in section 4.2; thereby supporting the claim that a promotion analysis is necessary to derive a definite relative and a *wh*-movement (matching) analyses is required to derive an indefinite relative. The latter type of relative cannot be derived by a promotion analysis because the Head DP of the relative clause cannot contain a properly licensed empty determiner. The same conclusion will be drawn for English relative constructions which exhibit the same range of reconstruction (im)possibilities as LA (section 4.3). The analysis of English relatives will be contrasted with Carlson's (1977) analysis of amount relatives and arguments will be presented that certain restrictive relative constructions, in addition to amount relatives, need to be derived by raising the Head and others must be derived by operator movement/Head-base-generation. Having established the derivations, we discuss in section 4.4 what phrase structures are most appropriate for relative constructions. We will show that the structures provided by our Head-raising and Head-base-generation analysis do not have the morphosyntactic problems inherent to the promotion analysis advocated by Kayne (1994), and Bianchi (1999). Further support for our analysis is provided by the behavior of adjunct relativization, specifically, their lack of reconstruction (section 4.5).

4.1. Two lines of pursuit

Relative constructions, especially those of English, have been studied quite extensively. Essentially, two lines of research have been pursued.

4.1.1. The Promotion analysis

In the early 70's the significant observation had been made that the Head of a relative clause can be interpreted as if it were in the gap position inside the relative clause (reconstruction effects). This led to the proposal that the Head is moved from within the relative clause --- the so-called promotion analysis; see Schachter (1973), Brame (1973), Vergnaud (1974). This analysis has received much renewed interest since the work of Kayne's (1994) Antisymmetry approach to word order and phrase structures, which rules out, in principle, any right-adjunction structures in the grammar of human languages. In essence, the promotion analysis now takes the following structure and derivation (see Kayne 1994, Bianchi 1999, 2000a,b):



³ We will return to the issue of whether NP or DP should be adopted.

Important empirical generalizations support the raising of the Head to its surface position (Head-raising) in deriving the relative construction. Consider English relative constructions, for instance. There are arguments for Head-raising based on the distribution of idiom chunks, binding and scope properties, or more generally, reconstruction effects. Regarding idioms, it has been shown that part of an idiom can occur as the Head of a relative clause which contains the other part of the idiom. Take the [V+O] idioms in the following examples for instance. The O part can be the Head of the relative clause and the V part is the verb of the relative clause. Given that the parts of an idiom need to be generated as a unit, such examples argue for the existence of a movement process (see Schachter 1973: 31-32).

- (2) a. The careful track that she's keeping of her expenses pleases me.
 b. The headway that Mel made was impressive.
 c. I was offended by the lip service that was paid to civil liberties at the trial.

Reconstruction effects are also illustrated by the binding possibilities in the following examples from Schachter 1973: 32-33.⁴

- (3) a. John_i painted a flattering portrait of himself_i.
 b. *Himself_i painted a flattering portrait of John_i.
 cf.
 (4) a. The portrait of himself_i that John_i painted is extremely flattering.
 b. *The portrait of John_i that himself_i/he_i painted is extremely flattering.
- (5) a. [John and Mary]_i showed a fleeting interest in each other_i.
 b. *Each other_i showed a fleeting interest in [John and Mary]_i.
 cf.
 (6) a. The interest in each other_i that [John and Mary]_i showed was fleeting.
 b. *The interest in [John and Mary]_i that each other_i showed was fleeting.

In addition, some instances illustrating scope interaction also argue for the availability of reconstruction: the Head nominal can be interpreted as having narrow scope with respect to another quantifier within the relative clause. The following examples are the English counterpart of the Italian examples provided by Bianchi (1999: 45-46, 122-123).

⁴ Schachter (1973) has examples indicating reconstruction with respect to Binding Principle C.

- (i) a. *The opinion of John_i that he_i thinks Mary has is unfavorable.
 b. *The portrait of John_i that he_i painted is extremely unflattering

Munn (1994) and Safir (1999), however, do not find (ia), for instance, to be ungrammatical. Bhatt (1999) notes that the obligatory relative-clause internal interpretation of the Head seen in (ia-b) is not a general property of relative clauses. The following example from Munn (1974) shows that the name *Al* cannot be interpreted in the relative-clause internal position:

- (ii) In [[the picture of Al_i] which he_i lent to us], he is shaking hands with the president.

Furthermore, see Bhatt (1999) section 1.3 for discussions on these tests, who further provides examples demonstrating reconstruction availability with examples regarding the scope of adjectives and pronoun binding.

- (7) a. Every doctor will examine two patients.
 b. Every doctor will examine the two patients.
 c. I phoned the two patients that every doctor will examine tomorrow.

(7)a) contains an object QP *two patients*, which can be interpreted as having narrow scope with respect to the subject QP *every doctor*. That is, there can be twice as many patients as doctors. (7)b), whose object contains a definite article, has only the reading according to which there are a total of two patients examined by the doctors. Interestingly, in (7)c) the relativized nominal (*the*) *two patients* can be interpreted as in (7)a): as having narrow scope with respect to the subject QP in the relative clause. This fact indicates that the Head can be interpreted in the direct object position, and hence it must have raised from that position (see section 4.1.3.3 for discussions regarding the role of the determiner heading a complex nominal).

The distribution of bound pronouns also exhibits reconstruction effects:

- (8) a. I would like to collect the best pictures of his_i best friend that everyone_i will bring tomorrow.
 b. I would like to collect the best pictures of his_i best friend that I think everyone_i will bring tomorrow.

In brief, there is ample evidence in the literature that reconstruction takes place in relative constructions in English; that is, the relative construction in English is accommodated by the promotion analysis.

4.1.2. *Wh*-movement -- the Matching analysis

In contrast, based on similarities among the many constructions that share the properties listed in (9) below, Chomsky (1977) suggests that relativization, together with other constructions such as clefts, comparatives, topicalization, and *easy-to-please* constructions, are all derived via *wh*-movement as in the case of *wh*-interrogatives.


- (9) i. The construction has a gap.
 ii. It allows long-distance relations.
 iii. It obeys island constraints.

These properties are illustrated in the following examples. (10) illustrates the existence of a gap, which, moreover, can be related to the relative pronoun *who* across clause boundaries (long-distance relation). In such a structure, the relative pronoun is interpreted with the Head *boy* via a predication rule or agreement relation (Chomsky 1977, Safir 1986, Browning 1987), which is also a matching relation between the Head and the *wh*-phrase to be relativized within the relative clause. The examples in (11) illustrate the relevance of island conditions. This analysis is conveniently labeled the Matching analysis.⁵

⁵ The first use of the term "the matching analysis" by Schachter (1973) refers to the fact that the derivation of a relative clause involves the deletion of a nominal expression in the relative clause under identity with the base-generated Head (see Lees 1960, 1961, Chomsky 1965; Kuroda 1968). We use the term "the matching analysis" to refer to the fact that the Head and the *wh*-operator must agree in all features, including "substantive" features, capturing the fact that when the Head is human, the *wh*-operator must be *who* and cannot be *which* or *where* or *why* etc. When the Head is reason, the *wh*-operator is *why* and is not *where* or *when* etc. The term, "substantive" features, is a convenient term to label the features that normally occur in N such as [+human], [+thing], [+place], in contrast to grammatical/functional features such as [+singular], [+definite]. An adverb such as *why* also has a "substantive" feature [+reason], even though *why* is not a nominal phrase.

- (10) the boy_i [who_i Mary thinks [t_i is the smartest]]
- (11) a. *the boy_i [who_i I like the teacher [who has taught t_i]]
 b. *the boy_i [who_i I will be happy [if you like t_i]]
 c. *the boy_i [who_i I wonder why [John has taught t_i]]

Schematically, then, the Matching analysis can be represented as follows:

- (12) The Matching analysis
 [NP/DP [_{Head} NP/DP_i ...] [_{Relative CP} wh_i [IP ... t_i ...]]]
- 

4.1.3. Comparisons

The promotion analysis and the matching analysis differ in two major aspects. One difference concerns reconstruction effects. Under the promotion analysis, the Head is derived by direct movement; whereas under the Matching analysis the Head is base-generated. A *wh*-operator is moved to the position close to the Head, i.e., the peripheral position of the relative CP, and bears a predication or agreement relation with the Head. Since there is not direct movement of the Head according to the matching analysis, naturally reconstruction of the Head does not occur.

The other difference concerns structures. The Matching analysis as stated in (12) has an adjunction structure: the relative CP is adjoined to the Head. The Head-initial word order in English means the relative clause is right-adjoined to the Head, under the Matching analysis. Such a right-adjunction structure, however, is not allowed at all if phrase structures are to be understood in terms of Antisymmetry as in Kayne 1994. Kayne, consequently, suggests that the structure does not involve adjunction. Instead, it involves a complementation structure: the D of the complex nominal takes a CP as its complement, as illustrated in (1), repeated below.

- (1) [_{DP} D [_{CP} NP/DP_i [C [IP ... t_i ...]]]]
- 

The differences between the two analyses can be summarized below:

(13)

	Structure	Derivation
the Promotion analysis	complementation	Head derived by movement
the Matching analysis	adjunction	Movement of an operator in predication/agreement relation with a base-generated Head

The promotion analysis, however, has not always adopted a complementation structure. In the earlier versions of the promotion analysis, such as Schachter (1973) or Vergnaud (1974), an adjunction structure is assumed: the relativized nominal is moved from within the relative clause to the Head position outside the relative clause where it is adjoined. It is only in the version of the promotion analysis proposed by Kayne (1994) that the Head is in the Spec of the relative CP and the CP is a complement to D --- the complementation structure. There are important generalizations in support of the complementation structure, as shown below.

According to the complementation structure, the following properties hold:

- (14) i. Because the relative CP is the complement of D, the presence of a relative CP entails the presence of D.
 ii. A selection relation between D and CP exists.
 iii. D does not form a constituent with the Head NP, which is in Spec of CP.

These characterizations are supported empirically, as we will see in the discussion that follows.

4.1.3.1. The obligatoriness of a DP structure

(14)i) indicates that the occurrence of a relative clause entails a DP projection. This requirement can be supported by some interesting constraints on the distribution of relative clauses. For instance, a predicate nominal, which is an NP, as opposed to a DP, cannot take a relative clause, even though modification per se is not ruled out. (15)a) shows that the predicate nominal *actor* can be modified by the adjective *brilliant*. However, such a predicate nominal cannot be modified by a relative clause, as illustrated by the unacceptability of (15)b).

- (15) a. Brilliant actor that he is...⁶
 b. *Actor that is brilliant that he is...
 c. *Actor that his father is that he is...

The following coordination facts also show the relevance of a DP projection. Generally, English allows *and* to conjoin DPs, NPs and NPs modified by adjectives.

- (16) a. He saw [[an actor] and [a producer]]. ---DP coordination
 b. He is an [[actor] and [producer]]. ---NP coordination
 c. He is a [[great actor] and [brilliant producer]]. ---Adj + NP coordination

Interestingly, however, when relative clauses occur in a coordination of relative constructions, a determiner must occur in each conjunct, suggesting that what is conjoined must be DPs.

- (17) a. *He is an [[actor that wants to do everything] and [producer that wants to please everyone]].⁷
 b. He is [[an actor that wants to do everything] and [a producer that wants to please everyone]].
 c. He is an [[actor] and [producer]] that wants to please everyone.
 d. He is [[an actor] and [[a producer] that does not know how to produce]].

The contrast between (17)a) and (17)b) demonstrates the obligatoriness of a determiner when a relative clause occurs. The relative clause in (17)c) must modify both of the conjuncts, not just one of the conjuncts. Nonetheless, a relative clause can, in principle, modify only one conjunct.

⁶ The contrast found in these sentences argues against deriving adjectives from (reduced) relative clauses. The same point will be made in chapter 5 where Chinese adjectives and relative constructions are compared.

⁷ Even though the paradigm here argues for a DP projection involving a relative clause, it raises the question of why (17)a) is unacceptable; i.e., why isn't it possible to coordinate the CP complements of D? This may have to do with the requirement that the article still needs to be associated with one and only one NP projection, namely, the Head contained in the periphery of the CP complement (cf. Bianchi 1999, 2000a and the discussions later in this section and section 4.2 concerning the inter-dependency between an external determiner and an internal determiner in a relative construction.) In all the other instances in (17), the article is associated with one and only one NP projection (in the case of (17)c), the single NP projection associated with the article contains two conjuncts).

If the conjunct has a determiner, the modification of that single conjunct is acceptable (17)d). These facts argue for the necessity of a DP projection when a relative clause occurs.⁸

4.1.3.2. Selection relation between D and CP

There is a very close dependency relation between the relative clause and the determiner (Bianchi 1999, Alexiadou et al. 2000). The D and the CP must co-occur in the following expressions.

- (18) a. the Paris *(that I knew) (Vergnaud 1974: 265)
b. the three books of John's *(that I read) (cf. Kayne 1994: 86)
c. the four of the boys *(that came to dinner)

Other examples illustrating the same close D/CP dependency can be found in Schmitt (2000: 311-312). They include type expressions (19), measure expressions (20), resultatives (21) and *with* expressions (22). The co-occurrence of a definite article in such expressions is made acceptable by the use of a relative clause.⁹

- (19) a. I bought one type of bread.
b. *I bought the type of bread.
c. I bought the type of bread you like.
- (20) a. Maria weighs forty-five kilos.
b. *Maria weighs the forty-five kilos.
c. Maria weighs the forty-five kilos Susana would love to weigh.
- (21) a. John painted the house a nice color.
b. *John painted the house the nice color.
c. John painted the house the nice color his girlfriend liked.
- (22) a. Mary bought a house with windows.
b. *Mary bought a house with the windows.
c. Mary bought a house with the windows that she liked.

In short, examples of the type above illustrate a close relation between D and the relative CP.¹⁰

⁸ Smith (1969) argues that a relative clause is part of the determiner.

⁹ More generally, demonstratives and *wrong*-type adjectives behave like relative clauses in these contexts: they make the relevant expressions acceptable.

- (i) a. *John bought the type of house.
b. John bought the wrong type of house.
- (ii) a. *John bought the type of house.
b. John bought that type of house.

See Schmitt (2000) for extending her complement analysis (adopting the insight of Kayne 1994) to these structures.

¹⁰ Carlson (1977) suggests that the patterns illustrated by the sentences below all show a selection relation between the determiner and the complementizer of the embedded clause and therefore, such an embedded

4.1.3.3. External determiner

In addition, arguments have been put forward indicating that structurally, the determiner *the* must be outside of the relative CP (the external determiner hypothesis). They are mainly based on facts demonstrating that the definite determiner *the* cannot have occurred inside the relative clause, as extensively discussed in Bianchi (1999:43-48). First, the trace of the relativized nominal is not interpreted as definite. (23)a-b), for instance, which involve the existential *there* construction, show that the relativized trace is indefinite because it occurs in a context that typically disallows a definite expression. This indicates that the determiner *the* cannot be part of the relativized nominal itself.

- (23) a. *There were **the** men in the garden.
b. **The** men that there were t in the garden were all diplomats.

Another argument is based on the fact that *the* occurs in a relativization structure even when the relativized nominal generally cannot tolerate the co-occurrence of *the*. The contrast between the pairs of expressions in (24), for instance, shows that *the* cannot occur with certain idioms but is allowed when a relative clause co-occurs:

- (24) a. *They made the fun of me. (Fabb 1990:71)
b. the fun that they made of me
c. *We made the headway on that problem. (Browning 1987: 130)
d. the headway that we made on that problem

A third argument concerns scope assignment under reconstruction, as illustrated by the interpretation of the sentences involving QPs such as those in (7), repeated here:¹¹

- (7) a. Every doctor will examine two patients.
b. Every doctor will examine the two patients.
c. I phoned the two patients [that every doctor will examine t tomorrow].

As mentioned earlier, the object QP *two patients* in (7)a) can have a narrow scope interpretation. (7)b), whose object contains a definite article, has only the reading according to which there are a total of two patients examined by the doctors. Importantly, (7)c), where the relativized nominal is preceded by a definite article, has the same interpretation as (7)a), not (7)b). The similarity of (7)c) with (7)a), not with (7)b), indicates that the relativized trace behaves like a nominal phrase without a definite article. In other words, the definite article is not part of the relative CP.¹²

clause has a determiner source, i.e., it is generated under the determiner node and is subsequently extraposed.

- (i) a. Max is taller [THAN Marie is].
b. Max is SO tall [THAT he has to crawl through doors].
c. Max is AS short [AS I thought he was].
d. Max is TOO tall [FOR us to hire (him) as our resident dwarf].

¹¹ Another argument discussed in Bianchi (1999: 46-48), which we will not repeat here, concerns floating quantifiers in Italian.

¹² In addition to the synchronic support, Bianchi (2000a) argues from an historical perspective that the complementation structure, where CP is a complement of D, bears great similarity to the correlative

4.1.3.4. DP

An additional property of such a complementation structure need to be clarified: the relation between the external D and what is moved to the Spec of CP. In Kayne (1994), what is moved can be an NP. However, according to Borsley (1997), what moves cannot be an NP. Moving an NP means the trace is an NP. However, this NP-trace occurs in a position where one would expect a DP. Note that an NP cannot be in an argument position:

(25) *Bill liked picture.

In addition, the trace behaves like a DP because it can bind a pronoun, obey Binding Principles, control a PRO, license a parasitic gap, and occur in a Case-marked position.

- (26) a. the man that t_i thought he_i saw a UFO.
b. the man that t_i tried PRO_i to fool everybody.
c. the book that Bill criticized t_i without reading pg_i.
d. *the man that it seems t to know the answer.

With respect to locality conditions, the movement of a DP and of an NP should obey weak island conditions differently, according to Borsley. A DP is referential; therefore, its extraction across a weak island should be quite acceptable. An NP, however, is non-referential; therefore, its extraction across weak islands should be more difficult, paralleling extraction of a non-referential *wh*-phrase, as illustrated in (27). Relativization across weak islands such as factive complements and infinitival *wh*-complements is acceptable, as in (28), in stark contrast to the unacceptability of *wh*-extraction of non-referential expressions across factive islands and infinitival *wh*-complements as in (27). Relativization patterns with DP, not NP movement.

- (27) a. *How do you wonder what to say?
b. *Why did you regret that John read the book?

- (28) a. the book that we wondered how to afford.
b. the book that we regretted that John read.

Accordingly, in Bianchi (1999) and her (2000b) reply to Borsley's objections against NP movement, the proposal was made that what is moved is not an NP, but a DP with an empty D. The empty D needs to be licensed. The licenser is the external D of the relative construction, *the* in (29).

(29) [_{DP} [_D the] [_{CP} [_{DP} \ominus man] [_{C'} that [_{IP} came here]]]]

Moreover, the Head DP (D being empty) in the CP peripheral position provides an NP that is necessary for the interpretation of the external D. That is, the relation between the external D and

construction. Based on data from Latin, Ancient Greek, Old English and Old High German, she shows that these Indo-European languages have both correlative clauses and headed relative clauses and the two constructions exploit exactly the same relative morpheme (p.55). Bianchi argues with Haudry (1973) that the headed relative developed from an earlier correlative structure. (p.56). The important step in the transition from a correlative structure to a headed relative clause is the addition of a D to the correlative CP: [D CP]. The historical development from correlatives to relative clauses, thus, is taken to be an argument for the [D CP] relative clause structure. This argument may hold for the languages discussed by Bianchi. However, Arabic does not seem to behave the same. As we will see shortly, LA has the same relative clause structure as English. Nevertheless, LA does not and did not have a correlative construction.

the Head DP in the Spec of the relative clause is double-edged: the external D licenses the internal empty D of the DP in the Spec of the relative CP and the external D has an NP to be interpreted with.

How is the internal empty D licensed by the external D and how is the external D interpreted with the NP which is selected by the internal D? According to Bianchi (1999, 2000b), the licensing of the internal D by the external D is achieved by incorporating the former to the latter. The incorporation is possible when the two determiners are adjacent to each other. Such an incorporation process makes it possible for the external D to be interpreted with the NP selected by the internal D. After incorporation, the external D and the internal D in a sense have become unified. Accordingly, the relation between the internal D and the NP it selects is the relation between the external D and this NP.

We, thus, may summarize the relation between the Head DP and the external determiner as follows:

- (30)
- i. In the relative construction [_{DP} D [_{CP} DP_i [C [_{IP} ... e_i ...]]], the DP in the Spec of CP (the Head) contains an empty determiner (the internal determiner).
 - ii. The empty internal determiner needs to be licensed.
 - iii. The external determiner needs to be interpreted with an NP.
 - iv. The empty internal determiner is licensed by the external determiner.
 - v. The external determiner is interpreted with the NP selected by the internal determiner.
 - vi. (iv) and (v) are achieved by the incorporation of the internal D to the external D.
 - viii. Incorporation takes place when the two determiners are adjacent to each other, as in the configuration in (i).

4.1.3.5. Structures vs. derivations

The above discussion shows that there are interesting generalizations in support of a complementation structure. Indeed, we have indicated that there are substantial arguments for the existence of reconstruction effects in relative constructions and for a complementation structure. The reconstruction effects argue for the promotion analysis --- the Head is moved to its surface position, not base-generated there as in the matching analysis. The complementation structure is the structure adopted by the promotion analysis, but never by the matching analysis. Given the evidence we have seen for a complementation structure, does this mean that the promotion analysis should be adopted and the matching analysis dispensed with? On the other hand, if there is any indication of the existence of operator movement (recall the basic tenet of a *wh*-operator analysis of relativization: the similarities of numerous constructions which all share the properties of *wh*-movement), does it mean that the adjunction structure must be adopted? In other words, does the existence of reconstruction effects argue for the complementation structure and the operator analysis for the adjunction structure (and vice versa)? And more fundamentally, are the arguments for reconstruction and complementation structures that we have seen so far applicable to all relative constructions?

In this and the following chapters, we will argue that both the promotion analysis and the matching analysis can capture important generalizations regarding different types of relative constructions in various languages. However, a more appropriate description of the generalizations regarding various types of relative constructions requires us to not adopt the two analyses as they stand. Instead, the promotion analysis (1) and the matching analysis (12) should be deconstructed into the subparts in (31) and (32).

- (31) i. Complementation structure: the relative clause is a complement to D
 ii. Adjunction structure: the relative clause is adjoined to the Head
- (32) i. Head-raising/Promotion: the nominal to be relativized moves to the Head position
 ii. Head base-generated/Operator movement: an operator moves to a position close to the Head, which is base-generated at its surface position.¹³

An important consequence of (32)i-ii) concerns the availability of reconstruction:

- (33) i. Head-raising allows the Head to be reconstructed.
 ii. Head base-generated/Operator movement does not allow the Head to be reconstructed.

The separation of (31)-(32) indicates the logical possibility that derivations should be independent of the structures adopted in these analyses. The existence of operator movement does not entail an adjunction structure and Head-raising does not entail a complementation structure. Operator movement can apply in a complementation structure and Head-movement can apply in an adjunction structure. We will further argue that languages do not exclusively apply either Head-raising (32)i) or operator movement (32)ii) to derive their relative constructions. Both derivations are available. The choice of either option is based on morpho-syntactic properties of the relative construction and other general conditions of the grammar. Our discussion in this chapter will draw on data from Head-initial relative constructions in English and LA and turn to Head-final relative constructions in the following chapters. More specifically, we will demonstrate in this chapter that both strategies in (32): Head-raising and Operator movement, are available to derive relative constructions in LA and English, and that both derivations can simply have a complementation structure.

4.2. Relative constructions in LA

The properties and analysis of various relative constructions in LA were the theme of Aoun and Choueiri (1997) and especially Choueiri (2001). The discussions in these works are quite detailed and extensive. We will not repeat their arguments and examples here, except for summarizing the main properties of these constructions, illustrated with a few examples. Then, based on these facts and the proposed analysis, we will show that LA relative constructions can be derived not only by Head-raising ((32)i) but also by operator movement as stated in (32)ii).

4.2.1. Reconstruction and Head-raising

The important facts regarding LA relative constructions and the account of these facts proposed in the works just cited can be summarized as follows:

- (34) a. A relative construction in LA can be definite or indefinite.
 b. A definite relative construction is introduced by a strong determiner and the relative has a definite complementizer *yalli*.
 c. An indefinite relative construction does not have an overt determiner and is introduced by an indefinite determiner (which is null or a numeral).
 d. In both definite and indefinite relative constructions, a resumptive pronoun must occur in any non-subject argument position from which the Head of the complex nominal is

¹³ In a promotion analysis such as Kayne's, what is moved can be a *wh*-NP with the NP raised to the Spec of the *wh*-phrase. That is, the Head is still moved to its surface position. What is important in our discussions is that the Head is base-generated and bears an indirect interpretation relation, rather than a direct movement relation with the *wh*-operator. See section 4.2.4.2. for further discussions.

relativized.

e. A definite relative construction exhibits reconstruction when the resumptive pronoun is not in an island; whereas reconstruction is not available when the resumptive pronoun is in an island.

f. An indefinite relative construction never exhibits reconstruction.

g. The reconstruction facts suggest that a definite relative construction is derived by movement in non-island contexts and is base-generated in island contexts, and that an indefinite relative construction is always base-generated.

The following examples illustrate a definite and an indefinite relative construction: definite relatives always occur with the complementizer *yalli*:

- (35) a. l-kteeb *(yalli) ʔtarayto mbeeri ʔ Daa ʔ
 the-book that bought.1s-it yesterday is-lost.3sm
 ‘The book that I bought yesterday is lost.’
- b. tʔaaSaS l-walad *(yalli) (huwwe) xazza ʔ l-kteeb
 punished.3sm the-boy that (he) tore.3sm the-book
 ‘The boy that tore up the book was punished.’

Indefinite relatives do not have such a complementizer:

- (36) a. ʔam fatti ʔa kteeb (*yalli) Dayya ʔt-o l-yom
 Asp look.1S for book that lost.1s-it today
 ‘I am looking for a book that I lost today.’
- b. ʔam fatti ʔa walad (*yalli) Darab Kariim
 Asp look.1s for boy that hit.3sm Karim
 ‘I am looking for a boy that hit Karim.’

According to the works cited above, definite relatives exhibit a reconstruction effect, which can be illustrated by the following examples of scope reconstruction:

- (37) a. badda l-mudiira tʔtʔarraf ʔala l-mara yalli kʔll
 want.3sf the-director meet.3sf on the-woman that every
 mwaz ʔzʔaf ʔeeb-a ma ʔ-o ʔa-l-ʔafle
 employee.ms brought.3sm-her with-him to-the-party
 ‘The director wants to meet the woman that every employee brought with him to the party.’
- b. ma ʔuule yʔa ʔi ʔo ma ʔ l-kam ʔaaris yalli tʔalab
 possible question.3p with the-few guard that asked.3sm
 r-ra ʔis ʔnno ywa ʔfuw-un ʔdeem kʔll bineeye
 the-president that stand.3p-them in-front every building
 ‘It is possible that they question the few guards that the president asked that they make them stand in front of every building.’

As indicated in Choueiri (2001), these sentences allow a reading according to which the Head is reconstructed.

Similarly, the following sentences from Choueiri (2001) illustrate reconstruction in cases involving bound pronouns.

- (38) a. \square aleemit fa \square s \square -[o]_i yalli \square arrarit l-m \square allme \square \square nno
 grade exam-[his]_i that decided.3sf the-teacher.fs that
- tfee \square _i [k \square ll t \square lmiiz]_i fiy-a ra \square t \square t \square la \square bukra
 surprise.3sf [every student]_i in-it fut. come-out.3sf tomorrow

‘The grade of his_i exam that the teacher decided to surprise every student_i with will be ready tomorrow.’

- b. \square a \square areet \square naynt-[o]_i yalli Nada bta \square rif \square \square nno
 trees garden-[his]_i that Nada know.3sf that
- [wala \square nayneete]_i by \square hm \square l-un balla \square o yzahrho
 no gardner neglect.3sm-them started.3p bloom.3p

‘The trees of his_i garden that Nada knows that no gardner_i neglects started to bloom.’

In both ((38)a) and ((38)b) a pronoun contained within the Head can be bound by a quantificational phrase within the relative clause. This means that ((38)a-b) are acceptable under a distributive reading of the quantifier inside the relative clause. Notice that in both instances the quantifier inside the relative clause occurs in an embedded clause (which rules out the possibility of generating the distributive reading by QR, which is generally clause-bound, as opposed to generating it by reconstruction).

Without further elaboration or quotations from the works cited, it is sufficient to point out that there is ample evidence for the existence of reconstruction effects in definite relative constructions. Therefore, clearly, definite relatives are derived by Head-raising.

In contrast, an indefinite relative construction does not display any reconstruction effects. For instance, a pronoun contained within an indefinite relativized DP can never be bound by a QP in the indefinite relative clause. This generalization is illustrated below:

- (39) a. * \square \square ft [Suura la- \square \square bn-a_i]_j [k \square ll mwazzafe]_i; badda t \square all \square \square -a bi-maktab-a
 saw.1s [picture of-son-her] [every employee.f] want.3sf hang.3sf-it in-office-her
 ‘I saw a picture of her son every employee wants to hang in her office.’
- b. * \square \square ft [Suura la- \square \square bn-a_i]_j [k \square ll mwazzafe]_i; \square aalit \square \square nno badda t \square all \square \square -a bi-maktab-a
 saw.1s [picture of-son-her] [every employee.f] said.3sf that want.3sf hang.3sf-it in-office-her
 ‘I saw a picture of her son every employee said she wants to hang in her office.’

Using reconstruction as a diagnostic for the availability of movement, Aoun and Choueiri (1997) and Choueiri (2001) interpret the absence of reconstruction effects in indefinite relatives as indicating the absence of movement in that construction. According to their analysis, an indefinite relative does not have a complementizer and nothing forces movement to occur; thus, movement does not occur. In other words, in LA, movement in relative constructions is a last resort strategy.

4.2.2. Operator analysis

Such an analysis, even though it accommodates the difference in reconstruction possibilities between definite and indefinite relative constructions quite well, leaves some other differences between the two constructions unaccounted for. For instance, the two constructions also differ in whether an in-situ *wh*-phrase is allowed inside the relative clause: a definite relative allows an in-situ *wh*-phrase, but an indefinite relative does not:

- (40) a. * \square iryit Zeina kteeb miin katab-o
 read.3sf Zeina book who wrote.3sm-it
 'Zeina read a book that who wrote?'
 cf.
 b. \square iryit Zeina l-kteeb lli miin katab-o
 read.3sf Zeina the-book that who wrote.3sm-it
 'Zeina read the book that who wrote?'
- (41) a. *xabbarto Zeina \square an bint \square arrafit miin \square a-Kariim
 told.2p Zeina about a girl introduced.3sf who to Karim
 'You told Zeina about a girl that introduced whom to Karim?'
 cf.
 b. xabbarna Zeina \square an l-bint lli \square arrafit miin \square a-Kariim
 told.1p Zeina about the girl that introduced.3sf who to Karim
 'You told Zeina about the girl that introduced whom to Karim?'

Interestingly, however, a *wh*-phrase can be related to a resumptive pronoun inside an indefinite relative.

- (42) miin \square iryit Zeina kteeb katab-o
 who read.3sf Zeina book he wrote.3sm-it
 'Who_j did Zeina read a book that he_i wrote?'
- (43) miin_i xabbarto Zeina \square an bint \square arrafit-o_i \square a-Kariim
 who told.2p Zeina about a girl introduced.3sf-him to Karim
 'Who_i did you tell Zeina about a girl that introduced him_i to Karim?'

Recall that in section 2.4.1. of chapter 2, we showed that LA obeys a *wh*-island boundary strictly. The extraction of a *wh*-phrase across a *wh*-island is not acceptable.

- (44) *miin badtkun ta \rifo miin sheef
 who want-you.acc know-2pl who saw-3sm
 '?*who_j do you want to know who_i t_i saw t_j?'

This sentence can be made acceptable by the use of a resumptive pronoun:

- (45) miin badtkun ta \rifo miin sheefo
 who want-you.acc know-2pl who saw-3sm-him
 'who_j do you want to know who_i t_i saw him_j?'

Moreover, in LA an in-situ *wh*-phrase inside a *wh*-island cannot be interpreted as having scope outside the island. The following sentence, for instance, can only have an indirect question interpretation.

- (46) badtkun taʕrifo miin sheef miin
 want-you.acc know-2pl who saw-3sm who
 'You want to know who saw whom?'

The paradigm in (40)-(46) demonstrates that an indefinite relative, but not a definite relative, behaves exactly like a *wh*-island. This follows straightforwardly if an indefinite relative construction contains an operator,¹⁴ just as a *wh*-island contains an operator, but a definite relative does not.

Such a difference allows us to explain other contrasts between the two types of relatives. Consider the distribution of strong pronouns in LA. According to Aoun and Choueiri (2000) and Aoun, Choueiri and Hornstein (2001), strong pronouns, unlike weak pronouns, are subject to the disjointness requirement stated in (47) (see also Chao and Sells 1983, Borer 1984, Montalbetti 1984, Aoun and Li 1990, McCloskey 1990, and Ouhalla 1993):

- (47) Strong or tonic pronouns cannot be linked to the most local operator.

The generalization in (47) accounts for the fact that weak pronouns, but not strong ones, can resume *wh*-phrases, for instance, when no island separates the *wh*-phrase from the strong pronoun:

- (48) a. ***miin** fakkarto **huwwe** b-l-beet
 who thought.2p he in-the-house
 'Who did you think he was at home?'
 b. **miin** fakkartu-**u** b-l-beet
 who thought.2p-him in-the-house
 'Who did you think he was at home?'

If an indefinite relative contains an operator, we would predict that a strong pronoun cannot resume the Head of an indefinite relative. This is indeed the case:

- (49) *ʔft bnt btiftikro nno hiyye ma ra t rba s-saba.
 saw.1s girl that think.2p that she neg. fut. win.3sf she the-race
 'I saw a girl that you think that she will not win the race.'

Moreover, because the generation of a definite relative need not involve an operator, it is expected that a strong pronoun can resume the Head of a definite relative, as is indeed the case:

¹⁴ Note that LA does not use *wh*-words (those appearing in *wh*-interrogatives) as relative pronouns overtly. However, the function of the null operator in an LA indefinite relative can be taken as the null counterpart of the relative *wh*-operator in English. For ease of presentation, we will refer to a relative operator as a *wh*-operator as well even in languages that do not use the same form for interrogative pronouns and relative pronouns.

- (50) $\text{ʔ}\text{ʔ}\text{ft } \mathbf{I}\text{-b}\text{ʔ}\text{nt } \text{yalli } \text{btiftikro } \text{ʔ}\text{ʔ}\text{nno } \text{hiyye } \text{ma } \text{ra}\text{ʔ} \text{ t}\text{ʔ}\text{rba}\text{ʔ} \text{ s-saba}\text{ʔ}.$
 saw.1s the-girl that think.2p that she neg. fut. win.3sf she the-race
 'I saw the girl that you think that she will not win the race.'

The unacceptability of a strong pronoun resuming the Head in an indefinite relative as in (49) indicates that an indefinite relative necessarily contains an operator. Following the account for definite relatives by Aoun and Choueiri (1997), and Aoun, Choueiri and Hornstein (2001) that movement (Head-raising) applies when relativization is from an extractable position and base-generation applies when relativization is from a non-extractable position, an indefinite relative is derived by operator movement when relativization is from an extractable position and the operator is base-generated otherwise.¹⁵

In sum, the reconstruction facts concerning definite and indefinite relatives require different analyses of the two constructions. The availability of reconstruction for definite relatives is expected under the Head-raising analysis. The unavailability of reconstruction for indefinite relatives suggests either that indefinite relatives are base-generated and do not involve an operator (as in the analysis of Aoun and Choueiri 1997) or that they are derived by the movement of an operator to a position close to the base-generated Head (32)ii (with base-generation occurring only in non-extractable contexts). We established that the following important generalizations can be captured if the operator analysis in (32)ii, as opposed to the pure base-generation approach, is adopted for indefinite relatives: (i) the fact that such relative constructions behave like *wh*-islands with respect to the distribution of *wh*-interrogatives and (ii) the fact that the Head of an indefinite relative cannot be resumed by a strong pronoun. These two properties of indefinite relatives contrast with those of definite relatives, which do not behave like *wh*-islands and which can be resumed by strong pronouns. It, therefore, can be concluded that the indefinite relative should be captured by the operator analysis and the definite relative by the Head-raising analysis.

4.2.3. What moves?

Questions arise, of course, as to why a definite relative is derived by Head-raising and an indefinite relative by operator movement. Note that the facts we have seen so far do not argue against the relevance of the operator analysis for definite relatives. All the relevant facts are still accommodated if a definite relative can be derived by either Head-raising or operator movement. As long as Head-raising is available, reconstruction is available, the construction need not be like a *wh*-island with respect to the presence of an operator and resumption by a strong pronoun is available. It does not matter if an additional derivation, the operator analysis as in (32)ii, is available. On the other hand, the facts do argue against the availability of Head-raising for indefinite relatives. Otherwise, the empirical differences between the two types of relative constructions would not be accounted for. Why, then, is Head-raising unavailable? Following the analysis of Choueiri (2001), we show below that Head-raising is in principle available. However, the derivation results in an ill-formed representation. The derivation crashes.

Recall that under a Head-raising analysis, what is moved is a DP with an empty internal D. This empty D needs to be licensed. Such licensing is not always available, however. Recall that

¹⁵ The question arises as to why the Head of the relative construction cannot bind the resumptive pronoun directly without the obligatory occurrence of an operator. This is due to the licensing/interpretation of a relative clause: the Head is either a constituent of the relative clause (as in the cases derived by Head movement) or the Head is in predication/agreement relation with the relative clause, which holds via an operator in the peripheral position of the relative clause.

different types of Ds are allowed in the external D position of a relative construction in LA: for a definite relative, the D is a definite determiner; for an indefinite relative, the D is a number expression or takes a null form. For convenience, we label the determiner of a definite relative a definite determiner and the number or null determiner of an indefinite relative an indefinite determiner. The main distinction between the two is that a definite determiner, but not an indefinite determiner, can license an empty determiner.

There is independent evidence for the distinction. Choueiri (2001) notes (note (19) of chapter 3) that construct state nominals illustrate a construction that can be analyzed as sometimes involving the licensing of a determiner by another determiner. When a determiner needs to be licensed by another determiner, the licensing determiner must be a definite determiner. This can be illustrated by the following examples.

(51) t[ab]it k[ll] walad *(l-)maksuura
 desk.fs every boy *(the-)broken.fs
 ‘the broken desk of every student.’

(52) t[ab]it walad
 desk.fs boy
 ‘A boy’s desk’

The presence of the quantifier in (51) indicates that *k[ll] walad* ‘every boy’ is a full DP. Interestingly, the construct state nominal in (51) has only one interpretation, the one given in the English translation, where the head noun is definite. This definiteness is marked by the presence of the definite article on the adjective that follows the construct state nominal in (51). The construct state nominal in (52) seems to be ambiguous between the interpretation *the desk of a boy* and *a boy’s desk (a desk for boys)*. It can be argued that only the former interpretation involves a determiner in the noun phrase headed by *walad* ‘boy’ and in that case, the head of the construct state is again definite:

(53) hayde t[ab]it walad m[n] ha-l-wleed *(l-)maksuura
 this desk.fs boy of this-the-boys *(the-)broken.fs
 ‘This is the broken desk of one of these boys.’

The other interpretation available for (51) gives rise to an indefinite noun phrase, but in that case *walad* ‘boy’ is interpreted non-referentially, as a kind noun, a bare NP:

(54) a. k[ll] t[ab]it walad maksuura
 every desk.fs boy broken.fs
 ‘Every broken boy’s desk’
 b.* k[ll] t[ab]it tleet wleed (maksuura)
 every desk.fs three boys (broken.fs)
 ‘Every (broken) three boys’ desk’

In (54)a the quantifier *k[ll]* ‘every’ selects an indefinite noun phrase, as indicated by the indefiniteness of the adjective that modifies the construct state nominal. ((54)a) can only have the interpretation where the noun phrase *walad* ‘boy’ is understood as referring to a kind. In fact, as (54)b indicates, the noun *walad* ‘boy’ cannot even be modified by a numeral if the construct state nominal is to form an indefinite noun phrase.

In brief, according to Choueiri (2000), the facts regarding construct state nominals show that the licensing of a determiner is only possible via a definite determiner. An indefinite determiner cannot license an empty determiner. Returning to the case of indefinite relatives, we need to recognize that the inability of an indefinite determiner to license another determiner should affect the structure and derivation of relative constructions. That is, when what occurs in the Spec of CP of an indefinite relative construction is a DP with an empty internal D, this empty internal D would fail to be licensed because the external determiner is an indefinite determiner. When the empty internal determiner cannot be licensed, the derivation crashes. This amounts to saying that, in an indefinite relative, we simply cannot have a DP with an empty D in the Spec of the relative clause. The LA indefinite relative clause therefore cannot be derived by DP movement; therefore, Head-raising is not available and reconstruction of the Head is not available.

4.2.4. Summary

The properties and analysis of the LA definite and indefinite relative constructions may be summarized below:

- (55) i. A definite relative construction in LA is headed by a definite determiner.
ii. An indefinite relative is headed by an indefinite determiner.
- (56) i. A definite determiner, but not an indefinite one, can license an empty D.
ii. A DP in the Spec of the relative clause with an empty D can be licensed by the external determiner when it is a definite one. The licensing also makes it possible for the external D to be interpreted with an NP, the one related to the internal determiner.
iii. Head-raising applies to derive definite relatives when relativization is from an extractable context and base-generation applies when relativization is from a non-extractable context. It, therefore, is possible to reconstruct the Head to its base-generated position in the relative clause when relativization is from an extractable context.
- (57) i. When the external D is an indefinite one, it cannot license an empty D. A DP with an empty D in the Spec of the relative clause will make the derivation crash.
ii. An operator can be moved to the Spec of the relative clause (or be base-generated there when relativization is from a non-extractable context). The operator stands in a predication or agreement relation with the Head, which is base-generated. Reconstruction of the Head in these contexts, therefore, is not available.

The analysis of LA relatives argues against an exclusive Head-raising approach (32)i) to relativization. Operator movement (and Head base-generated) as in (32)ii) must also be available. Both derivations are always in principle available. However, one may fail to be realized for independent reasons. In the case of indefinite relatives in LA, Head-raising turns out to be unavailable because of the inability of an indefinite determiner to license the empty D of the raised DP. The following conclusions, thus, can be made:¹⁶

¹⁶ Ofarli (1994)'s analysis of Norwegian relative constructions also includes two classes: one involves a (Head-)raising analysis and the other is not. The one that involves an overt relative pronoun (*der*-relatives) is not derived by the Raising analysis, while a relative clause that does not involve an overt relative pronoun (*som*-relatives) is derived by the raising analysis. Bhatt (1999) also notes that some English relative clauses cannot be derived by the Head-raising analysis, especially those involve complex pied-piping, such as (i):

- (i) The first movie **whose score** John ever said that Shostakovich composed.

- (58) i. Relativization can be derived either by Head-raising as in (32)i) or by Head-base-generation/operator movement as in (32)ii).
 ii. Reconstruction is available with Head-raising as in (32)i) and is not available with Head-base-generation/operator movement as in (32)ii).

In the next section, which concentrates on English relative constructions, we will show that this conclusion is also true for English. Both derivations, in principle, are available for English. However, in some cases, one of the two derivations may not yield well-formed representations for independent reasons.

4.3. English

4.3.1. Head-raising or not?

As shown in section 4.1.1, deriving a relative construction by Head-raising in English is supported by important facts concerning the distribution of idioms and reconstruction effects in relative constructions containing anaphors, bound pronouns and QPs. Nonetheless, there have been observations and claims made against such an analysis of English relative clauses. It has been noted that it is not true that all relative constructions show reconstruction effects or that the Head is necessarily raised from within the relative clause. McCawley (1981), for instance, observed that the Head can be an idiom chunk related to the matrix verb in some instances, rather than being related to verb of the relative clause (cf. (2)):

- (59) John **pulled the strings** that got Bill the job.

Carlson (1977) argues that finer distinctions of different types of relative clauses should be made, i.e., a distinction between amount relatives restrictive relatives should be made, in addition to appositive relatives (also see Heim 1987, Grosu and Landman 1998). He suggests that amount relatives are derived by Head-raising but not necessarily restrictive relatives. Although amount relatives show reconstruction effects, this is not the case with restrictive relatives, as briefly described below.

According to Carlson, there are important properties characterizing "amount relatives" (AR's) as distinct from restrictive relatives (RR's). AR's do not allow a *wh*-relative pronoun and they allow only those determiners that can be followed by a number expression. He demonstrates the differences by the following examples. The examples in (60) illustrate the unacceptability of a *wh*-pronoun in an AR (the relevant sentences have only an amount interpretation) and the sentences in (61) illustrate the fact that when *some* is the determiner, the only interpretation is that of a RR, not an AR. The table in (62) illustrates the two types of determiners that are acceptable or unacceptable in AR's. The unacceptable ones are those that cannot occur with a number expression.

- (60) a. Marv put everything that he could in his pocket.
 b. *Marv put everything which he could in his pocket
- (61) a. Marv put something which was bigger than his fist in his pocket.
 b. Marv put something that was bigger than his fist in his pocket.
- (62) Two types of determiners: Carlson (1977: 525)
- | | |
|--------|---------|
| Type I | Type II |
|--------|---------|

See note (18) for speaker variations.

ACCEPTABLE

the 40 men
these few insects
every ten minutes
any five cigars
all fifty Vikings
what few remarks
-er many bottles
these two answers
these five criminals
my many dreams

UNACCEPTABLE

ten many people
few several incidents
lots of many boys
many twelve pounds
a several clods
some eight mammals
a few ten oboes
several many ladies
most nine squids
each fifty minutes

Carlson suggests that the AR's should be accounted for by a raising (promotion) analysis: the Head is derived by raising the relevant nominal. Noting that AR's exhibit reconstruction effects with respect to the distribution of idiom chunks but that RR's do not, as illustrated in (63), he suggests that the promotion (Head-raising) analysis applies to AR's and that the recognition of AR's as distinct from RR's "undercuts some reasons that have been given for a Raising analysis of RR's (though by no means all; and even with the facts from idioms, a Raising analysis of RR's is not ruled out entirely)." (p. 541).

- (63) a. {The, All, That, What} headway (that) Mel made was astounding.
 b. *{Some, Much, Most, Little, This, ☉} headway that Mel made was satisfactory.

Even though Carlson did not claim that restrictive relatives absolutely cannot be derived by a raising analysis and did not clarify when a restrictive relative can or cannot be derived by a raising analysis, he did question the validity of the reconstruction tests for restrictive relatives used in the literature. He noted that the arguments for a raising analysis of restrictive relatives in the literature run the risk of conflating amount relatives and restrictive relatives: "But a glance through Schachter reveals that the determiner of the head N is invariably *the*, no *wh*-forms are used; ... Vergnaud consistently uses the French definite article *le* The definite article may, of course, head an AR; so, in the examples used, we run the risk of conflating AR's and RR's." (p.535).

It is quite plausible that the choice of determiners and the choice of *wh* vs. *that* (or ☉) can affect the availability of Head-raising in English relatives in light of the fact regarding LA indefinite relatives that an indefinite determiner in that language fails to license an empty D, rendering Head-raising unavailable in that case. It is less clear, however, whether the distinction lies in the semantics: amount relatives vs. restrictive relatives. Note that it is not easy to understand how relative clauses like the one in (4)a), for instance, express amount (reconstruction possible), in contrast to the counterparts in (64)a-c), which cannot express amount, because of the use of *wh* and the use of non-amount determiners (type II in (62)):

(4) a. The portrait of himself_i that John_i painted is extremely flattering..

- (64) a. The portrait of Mary which John painted is extremely flattering.
 b. Some portraits of Mary that John painted are extremely flattering.
 c. Some portraits of Mary which John painted are extremely flattering.

The questions, then, are when and why Head-raising can apply to derive the different types of relative constructions. Moreover, what is the derivation when Head-raising does not apply? We show below that Head-raising is available in principle, but, just as was shown for the LA

indefinite relatives, it may not be realized for independent reasons. In those cases where Head-raising is not available, movement properties are still manifested, suggesting that the operator movement analysis (with a base-generated Head, (32)ii) must also be available. The insight of Carlson's observation is better recast in syntactic terms of Head-raising failing to apply instead of the semantic distinction of amount vs. restrictive relatives. The use of *wh*, instead of *that*, and the use of type II determiners, instead of type I determiners, are morpho-syntactic indications of the absence of Head-raising.

4.3.2. Operator movement¹⁷

Extending Carlson's observation, the use of *wh*-pronouns and type II determiners not only prevents idiom chunks from serving as the relative Head but also prohibits reconstruction in cases containing pronouns or quantifiers:

- (65) No reconstructed bound pronoun interpretation
 *some boys of his_i class [who I know everyone_i would bring t to the party]
- (66) No reconstructed narrow scope interpretation for the *some*
 some boys [who I know everyone_i would bring t to the party] -Head no narrow scope

Despite the lack of reconstruction, such constructions still show movement properties: they contain a gap and the gap cannot occur inside an island:

- (67) a. *[some boys [who John met [the student [that saw t yesterday]]]]
 b. *[some boys [who [[if John saw t] Mary would be happy]]]]
 c. *[some boys [who [that John saw t] was important]

These facts suggest that relative constructions can be derived by operator movement, rather than Head-raising alone. Indeed, for some speakers, the use of a *wh*-pronoun indicates derivation by operator movement, a *wh*-pronoun being the clue to the existence of a *wh*-operator.¹⁸ Accordingly, there is a systematic contrast with respect to the availability of reconstruction between a relative construction which uses a *wh*-relative pronoun (referred to as a *wh*-relative) and one that does not (referred to as a non-*wh*-relative). For instance, in comparison to (2), repeated below, relative constructions whose Heads involve idioms are worse when *that* is replaced by *which*:

¹⁷ The discussion regarding English would have been impossible without the generous help and arduous work on the data by Patricia Schneider-Zioga.

¹⁸ Some speakers do not find a contrast between *wh*-relatives and non-*wh*-relatives with respect to reconstruction. They regard the two types merely as stylistic variations: the use of a *wh*-pronoun is more formal than the use of *that* or \emptyset . Andrew Simpson (personal communication) suggests that, for such speakers, the *wh*-relative pronouns are re-analyzed as an X^0 in the complementizer position, rather than an XP in the Spec position. That is, for these speakers, the *wh*-pronouns function more or less like *that* syntactically (differing only stylistically). If such *wh*-pronouns are clearly XPs, reconstruction is difficult even for these speakers. For instance, the pronoun in the Head of (i) cannot be bound by the QP in the relative clause and the QP in the relative clause in (ii) cannot scope over the Head QP:

(i) *I saw the girl of his dream_i whose pictures (John said) every boy_i was showing off.
 (ii) I saw the two students whose friends (John thought) every teacher visited. -no narrow scope for *two students*

- (2) a. The careful track that she's keeping of her expenses pleases me.
 b. The headway that Mel made was impressive.
 c. I was offended by the lip service that was paid to civil liberties at the trial.
- (68) a. *The careful track which she's keeping of her expenses pleases me.
 b. *The headway which Mel made was impressive.
 c. *I was offended by the lip service which was paid to the civil liberties at the trial.

By contrast, when the idiom chunk is not inside the relative clause, the use of *wh* is quite acceptable:

- (69) John pulled the strings which got Bill the job.

The sentences below differ minimally from (4)a) and (6)a) in the use of a *wh*-pronoun in place of *that* and the change in degree of acceptability. These sentences are worse than (4)a) and (6)a) with respect to the reconstructed interpretation.

- (70) ??The portrait of himself_i which John_i painted is extremely flattering.
- (71) ??The interest in each other_i which John and Mary_i showed was fleeting.

The following examples show the same contrast in a variety of contexts with different types of verbs. The availability of reconstruction in *wh*-interrogatives is also contrasted.

- (72) a. The picture of himself_i (that) John_i painted in art class is impressive
 b. The picture of himself_i (that) John_i likes best is impressive
 c. *?The picture of himself_i which John_i painted in art class is impressive.
 d. *?The picture of himself_i which John_i likes best is impressive.
- (73) a. We admired the picture of himself_i (that) John_i painted in art class.
 b. We admired the picture of himself_i (that) John_i likes best.
 c. *We admired the picture of himself_i which John_i painted in art class.
 d. *We admired the picture of himself_i which John_i likes best.

The corresponding *wh*-interrogatives allow reconstruction easily:

- (74) a. Which picture of himself_i did John_i paint in art class?
 b. Which picture of himself_i does John_i like best?
 c. We wondered which picture of himself_i John_i painted in art class.
 d. We wondered which picture of himself_i John_i likes best.

The following examples illustrate the same contrast in embedded contexts:

- (75) a. The picture of himself_i that/??which John_i thinks Mary painted in art class is impressive.
 b. The picture of himself_i that/??which John_i thinks Mary likes the best is really ugly.
 c. We admired the picture of himself_i that/?*which John_i thinks Mary painted in art class
 d. We admired the picture of himself_i that/?*which John_i thinks Mary likes the best.
 e. The picture of himself_i that/*which Mary thinks John_i painted in art class is impressive.
 f. We admired the picture of himself_i ?that/*which Mary believes John_i painted in art class.

- g. The picture of himself_i ?that/*which every student_i bought was a rip-off.
- h. The picture of himself_i ?that/*which Mary said every student_i painted in art class is impressive.

Again, *wh*-interrogatives allow reconstruction easily:

- (76) a. Which picture of himself_i did John_i think Mary painted in art class/liked the best?
- b. We wondered which picture of himself_i John_i thinks Mary painted in art class/liked the best.
- c. Which picture of himself_i does Mary believe John_i painted in art class?
- d. We wondered which picture of himself_i Mary believes John_i painted in art class.
- e. Which picture of himself_i did every student_i say that Mary painted in art class?
- f. Which picture of himself_i did every student_i say that Mary liked the best?
- g. I wonder which picture of himself_i Mary said every student_i painted in art class.
- h. I wonder which picture of himself_i every student_i thinks Mary liked the best.

The examples above show a consistent contrast with respect to the interpretation of anaphors between *wh*-relatives and non-*wh*-relatives in the availability of reconstruction. *Wh*-relatives further contrast with *wh*-interrogatives in reconstruction availability.

The distribution of bound pronouns exhibits the same contrast between *wh*-relatives and non-*wh*-relatives and between *wh*-relatives and *wh*-interrogatives:

- (77) a. I would like to collect the best pictures of his_i best friend that everyone_i will bring tomorrow.
- b. ??I would like to collect the best pictures of his_i best friend which I think everyone_i will bring tomorrow.
- (78) a. The picture of his_i mother that/?*which every student_i painted in art class is impressive
- b. The picture of his_i mother that/?*which every student_i liked best was an old black and white.
- c. We admired the picture of his_i mother that/?*which every student_i painted in art class.
- d. We admired the picture of his_i mother/?*which that every student_i liked best
- e. The picture of his_i mother that/?*which every student_i thought (that) Mary had painted in art class is impressive.
- f. The picture of his_i mother that/?*which every student_i thought (that) Mary liked best is impressive.
- g. We admired the picture of his_i mother that/*?which every student_i thought (that) Mary had painted in art class.
- h. We admired the picture of his_i mother that/?*which every student_i thought (that) Mary liked best.
- i. The picture of his_i mother ?that/*which Mary thought that every student_i painted in art class is impressive.
- j. The picture of his_i mother that/*which Mary thought that every student_i liked best is impressive.
- k. We admired the picture of his_i mother ?that/*which Mary said every student_i painted in art class.
- h. We admired the picture of his_i mother that/*which Mary said that every student_i liked best.

cf. *wh*-interrogatives:

- (79) a. Which picture of his_i mother does every student_i think Mary painted in art class?
 b. Which picture of his_i mother did Mary say that every student_i painted in art class?

With respect to scope interpretation, it is interesting to note that there is also a contrast between *wh*- and non-*wh*-relatives:

- (80) a. I phoned the two patients (that) every doctor will examine tomorrow.
 b. I phoned the two patients who every doctor will examine tomorrow.

The relative with *that* allows a reading according to which each of the doctors examines two different ad hoc patients (a distributive interpretation), which is not available for the relative with *who* (Barry Schein, personal communication). Moreover, the following two sentences contrast in the availability of the wide scope interpretation of the quantifier *most* in the relative clause with a wide scope interpretation of *most* being available for the non-*wh*-relative only:

- (81) a. I will interview the two students (that) most professors would recommend.
 b. I will interview the two students who most professors would recommend.

The following generalizations, thus, emerge:

- (82) i. *Non-wh*-relatives exhibit reconstruction effects; i.e., the Head can be derived by movement from the position it is interpreted to its surface position
 ii. *Wh*-relatives do not exhibit reconstruction effects; i.e., the Head is not derived by movement from the position it is interpreted to its surface position. It is base-generated in its surface position.

Moreover, as mentioned, when a gap occurs in a *wh*-relative (as well as a *that*-relative), the relation between the gap and the *wh*-relative obeys the island conditions:

- (83) a. *the girl [who_i I have seen [the boy_j [who e_j loves e_i]]]
 b. *the girl [who_i I am happy because [the boy_j loves e_i]]

In brief, the two types of relatives¹⁹ can be derived by a Head-raising process and an operator movement process respectively:²⁰

¹⁹ There should be a third type: base-generation of both Head and operator. Corresponding to the two options of Head-raising and operator movement, there must be the variant according to which the Head is base-generated, not raised, and the operator is base-generated, not moved, in order to account for cases involving resumptive pronouns in English and the lack of reconstruction in such cases.

Prince (1990) shows that even though "relative clauses with resumptive pronouns are officially ungrammatical in English... they are in fact not uncommon in speech." (p.). Resumptive pronouns are found not only in contexts inaccessible to movement but also in positions where a gap is possible. The following examples are Prince's (4a-c):

- (i) a. ...the man who this made him feel sad... (Prince (7a), p.)
 b. Some of the same judges who we told them that if you mess with John Africa, you're going to... (Prince (7b), p.)
- (ii) a. They were just towed across the Midway onto the bridle path, where they were just sitting there peacefully.

- (84) i. *Non-wh*-relatives are derived by Head-raising
 ii. *Wh*-relatives are derived by operator movement²¹

Before concluding this section, we would like to emphasize that the contrast between (84)i) and (84)ii) cannot be reduced to the difference between amount relatives and restrictive relatives as discussed earlier regarding Carlson (1977). It is doubtful that the empirical contrast observed so far with respect to reconstruction concerns with the semantic notion of amount. Just as the contrast between (4)a) and (64)a-c) can hardly be understood as amount vs. restrictive relatives, it is as difficult to understand that the *that*-relatives are amount or degree relatives in the examples we have seen so far, such as (85) below, where the replacement of *that* by a *wh*-pronoun, such as in (86), would putatively make them restrictive relatives:

- (85) a. We admired the picture of himself_i that John_i painted in art class.
 b. We admired the picture of himself_i that John_i likes best.
- (86) a. *We admired the picture of himself_i which John_i painted in art class.
 b. *We admired the picture of himself_i which John_i likes best.

Note further that the *that*-relatives that exhibit reconstruction effects also allow stacking,

- (87) a. We admired the picture of himself_i that he_i painted in art class that he_i likes best.
 b. We admired the picture of himself_j for her_i mother that Picasso_j painted that every girl_i requested.
 cf. Every girl_i requested the picture of himself_j for her_i mother that Picasso_j painted.

Stacking is a property of restrictive relatives, not amount relatives, according to Carlson (p.540):

- (88) a. I dreamed of several books which I saw yesterday which I had hoped to buy.
 b. *Jake noticed the headway we made that Fred said we couldn't make.

-
- b. That's a suggestion of yours which I followed, which I didn't even want to do that.
 c. I have a friend who she does all the platters.

The use of resumptive pronouns, however, disallows reconstruction:

- (iii) a. *I am resolved to meet the girl of his_i dreams that every man_i is convinced she will love him passionately.
 cf. b. I am resolved to meet the girl of his_i dreams that every man_i is convinced ☉ will love him passionately.

Resumption in relative constructions is correlated with lack of reconstruction in English; i.e., resumption is correlated with lack of movement.

²⁰ To be noted, however, is that even though the presence of an overt *wh*-phrase in a relative clause (the *wh*-relative) indicates that the relative is derived by operator movement, the absence of an overt *wh*-phrase, such as in a *that*-relative or a relative without *that* or *wh* does not indicate how such a relative must be derived. Both Head-raising and operator movement could be available.

²¹ Philippe Schlenker (personal communication) points out that the *wh*-operator movement analysis can also accommodate non-restrictive relative clauses (appositives) in English, which also fail to exhibit reconstruction effects.

In brief, the generalization in (84) cannot be reduced to the purely semantic distinction between amount relatives and restrictive relatives. What is claimed in (84) is that, even among restrictive relatives, the use of a *wh*-pronoun makes a distinction: when a *wh*-pronoun is used, reconstruction is not available; when a *wh*-pronoun is not used (such as in a *that*-relative), reconstruction is available. Amount relatives do not use *wh*-pronouns and therefore, the fact that amount relatives allow reconstruction is a subset of a more general observation that non-*wh*-relatives allow reconstruction and can be derived by Head-raising.

4.3.3. Determiners

The previous section shows that the use of a *wh*-pronoun is an indication that the structure is derived by the movement of a *wh*-operator which is in a predication/agreement relation with the base-generated Head (the matching analysis). This is one part of Carlson's observation regarding the use of *wh* vs. *that*/⊙. The other part of Carlson's observation concerns the use of determiners: relatives with type II determiners in (62) should not be derived by Head-raising, i.e., they should not exhibit reconstruction effects. This is quite true with the cases illustrating scope interaction. For instance, type II determiners cannot be interpreted as having narrow scope with respect to another quantifier in the relative clause:

- (89) a. [some patients [that Mary said every doctor would examine tomorrow]]²²
 b. [two patients [that I think every doctor will examine tomorrow]]

Idiom chunks with type II determiners are also worse, as noted by Carlson:

- (90) *Some/Much headway that Mel made was satisfactory.

The cases with anaphors and bound pronouns, however, are less clear. Nonetheless, the contrast seems to be in the right direction, as illustrated by the following examples.

- (91) a. ??I saw some pictures of his_i mother that Mary said everyone_i liked the best.
 b. ??I saw some pictures of himself_i that Mary said everyone_i liked the best.
 c. ??I brought two pictures of [each other]_i that [John and Bill]_i took.

cf.

- (92) a. I saw the pictures of his_i mother that Mary said everyone_i liked the best.
 b. I saw the pictures of himself_i that Mary said everyone_i liked the best.
 c. I brought the two pictures of [each other]_i that [John and Bill]_i took.

- (93) a. *I know a story about himself_i that no student_i would tell to the class.²³
 a'. No student_i would tell a story about himself_i to the class.
 b. *I know a story about his_i friend that no student_i would tell to the class.
 b'. No student_i would tell a story about his_i friend to the class.

²² The lack of narrow scope reading of such a sentence is observed by Bianchi (1999), who claims that *some* is obligatorily raised to the external determiner position which is not part of the Head and is not reconstructed. However, one might plausibly argue that the empty internal determiner is licensed/identified by *some*. Such an empty determiner may assume the properties of *some* after the licensing. On the other hand, if there is simply no DP raising in such cases (for instance, because the empty D fails to be licensed), we need not be concerned with the issue of whether or not it is appropriate that the licensing allows the internal determiner to assume the properties of the external determiner.

²³ For some speakers, the use of the quantifier 'every' for the QP in the relative clause seems to allow the reconstructed interpretation more easily. This may be related to the possibility of "quirky binding" as discussed in Ueyama (1998).

cf.

- (94) a. I know the story about himself_i that no student_i would tell to the class.
b. I know the story about his_i friend that no student_i would tell to the class.

In brief, both parts of Carlson's observation are manifested in relatives which can hardly be interpreted as denoting amount (i.e. non-amount, restrictive relatives): the choice of *wh*-pronouns vs. *that*/ \emptyset and the choice of different determiners. The effect of different determiners mirrors the same distinction found in LA relatives: definite determiners license an empty D but not indefinite determiners. The former, therefore, allows DP-raising (Head-raising analysis) but not the latter. Such a similarity suggests that, if Carlson is correct in his distinction of the two types of determiners, type I determiners can license an empty D, but not type II determiners. The issue, of course is why this is so. We may speculate that, given that type II determiners must not occur with a number expression, they probably are the conflation of D and Number nodes, which fails to license an entity that is simply D (licensing requires identity of nodes, for instance). We will leave this issue for further research.

Nonetheless, a solid general conclusion can still be made: in those relative constructions containing a gap and not exhibiting reconstruction, operator movement (the matching analysis) must have applied. This is because relative clauses in English always obey island conditions, as long as there is a gap. It does not matter what determiners are used and whether a *wh*-pronoun occurs. In other words, again we arrive at the same the conclusion reached in earlier sections of this chapter: both the Head-raising analysis (32)i) and the operator movement analysis (the matching analysis, (32)ii) are needed to derive relative constructions. Further evidence in support of a *wh*-operator movement analysis for relatives with type II determiners lies in the contrast between the following pair of sentences:

- (95) a. Who introduced the man that talked about what?
b. ??Who introduced a/some man that talked about what?
- (96) a. Who saw the man (that) who introduced?
b. ??Who saw a/some man (that) who introduced?

The (b) sentences in (95)-(96) improve when the *wh*-phrase inside the relative is replaced by a non-*wh*-phrase:

- (97) a. Who introduced the man that talked about sports?
b. Who introduced a/some man that talked about sports?

These contrasts show that when a relative is headed by the determiner *the*, which allows Head-raising and does not involve a *wh*-operator, a *wh*-phrase can occur inside the relative clause. In contrast, when the determiner is *a/some*, the relative is derived by *wh*-operator movement and contains a *wh*-operator. A *wh*-island is present in the latter but not in the former, which accounts for the differing acceptability of another *wh*-phrase in the relative.

4.4. Structures

The discussion so far provides important empirical evidence for distinguishing different types of relative constructions, such as *wh*-relatives from *non-wh*-relatives within restrictive relatives. It argues for the need of both a Head-raising analysis and an operator analysis ((32)i-ii).

Does the existence of both Head-raising and operator movement with a base-generated Head suggest that both the complementation structure and the adjunction structure should be adopted

(see section 4.1)? The discussion in section 4.1.3 indicates that the complementation structure is well-supported. If the complementation structure is sufficient for both types of relative constructions (those derived by Head-raising and those derived by operator movement), the adjunction structure can be dispensed with, which will make right-adjunction structures unnecessary (cf. the discussion on Kayne (1994)'s Antisymmetry approach to phrase structures). We show below that a complementation structure such as the one proposed in Bianchi (1999), refining Kayne (1994), is sufficient to accommodate both options of Head-raising and operator movement. Indeed, allowing both options in the said complementation structure has further advantage: it solves the problems faced by the analysis of Kayne/Bianchi. We will illustrate these claims with *wh*-relatives and non-*wh*-relatives in English. The analyses of different relatives according to their determiners and the LA relatives can be accommodated in the same manner.

Recall that under a Head-raising analysis, the Head DP, with an empty D, is raised to the peripheral position of the CP. That is, a non-*wh*-relative has the following structure and derivations:

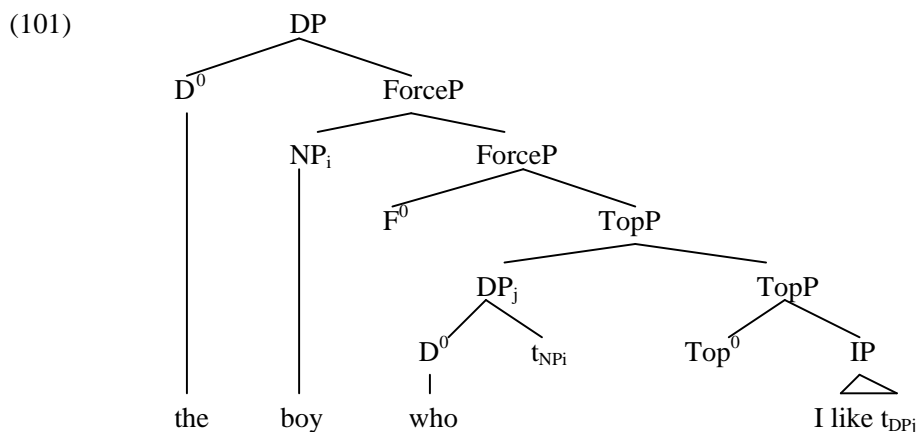
$$(98) \quad [DP \ D \ [CP \ DP_i \ [C \ [IP \ \dots \ t_i \ \dots \]]]]$$

$$(99) \quad [DP \ the \ [CP \ [DP \ \ominus \ picture]_i \ [C' \ that \ [IP \ Bill \ liked \ t_i \]]]]$$

According to Kayne (1994), the relatives containing *wh*-phrases are derived in a similar manner. Kayne (1994, chapter 8) suggests that a *wh*-relative is derived by raising a *wh*-phrase to the Spec of DP, followed by the raising of the NP to the Spec of the *wh*-phrase, i.e. a two-step movement process.

$$(100) \quad [DP \ [D \ the] \ [CP \ [DP \ boy_i \ [who \ t_i \] \] \ [C' \ [IP \ I \ like \]]]]$$

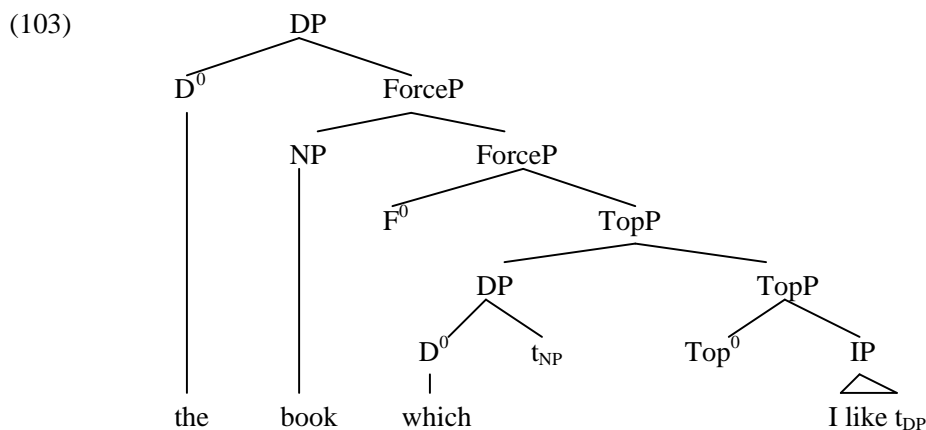
Bianchi (1999) refined the analysis and claimed that the NP is not moved to the Spec of the *wh*-phrase. Instead, it is moved to the Spec of a higher projection, adopting a split CP analysis (Rizzi 1995).



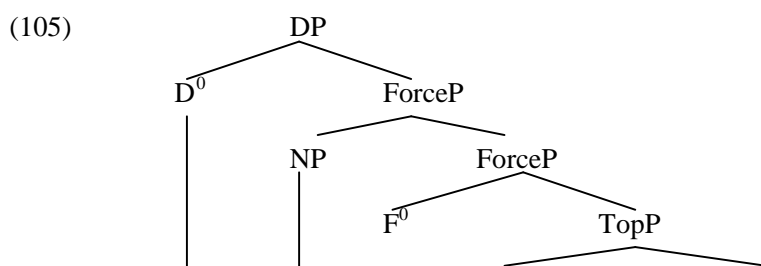
In brief, according to Kayne/Bianchi, a relative clause with a *who*-phrase is derived by base-generating [*who* NP] in the argument position. The phrase [*who* NP] is moved from within the relative IP to the Spec of a Topic projection which is complement to a Force Projection. The NP of the phrase [*who* NP] undergoes further movement: it moves from inside the DP occupying the Spec of TopP to the Spec of ForceP.

This analysis, however, rests on some questionable assumptions. Note that the structure in (101) must base-generate such phrases as [*who* NP], [*why* NP], [*where* NP], [*when* NP], which are impossible in any other contexts (such as the interrogative patterns).²⁴ The NP, which is selected by the *wh* in the D position needs to undergo movement to be interpreted with the external D (so that the external D can be interpreted, cf. ((30)v)). In such a structure, the internal D is a lexical *wh*. It is not clear that it is incorporated with the external D. They do not occur adjacent to each other. Moreover, unlike the DP with an empty D incorporated with the external D and the two Determiners becoming two in one, the cases with *wh*-phrases have an NP interpreted with two lexical Ds. If this is possible, it is not clear why English does not allow expressions like *the which boy*, *the who*, *the when* etc.²⁵ Moreover, the structure and derivation are empirically inadequate. In the same way that (102) has the structure in (103), with the NP *book* moved from the Spec of DP occupying the Spec of TopP to the Spec of ForceP, we should be able to derive (104) from (105). However, (104) is not acceptable. *Which* in fact cannot occur when the Head is animate even though [*which* + animate NP] is perfect. That is, we need to generate an otherwise unacceptable [*who* boy], as in (101), in order to derive a well-formed relative construction. If we generate an acceptable [*which* boy], we cannot derive an acceptable relative construction.²⁶

(102) the book which I like



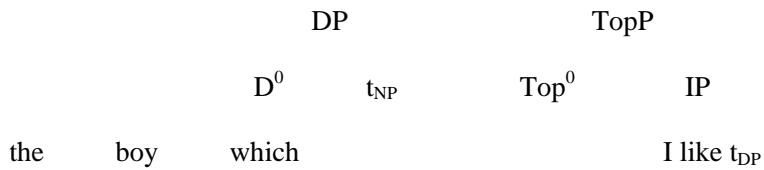
(104) *the boy which I like



²⁴ The form *what* NP also does not exist in constructions other than free relatives.

²⁵ If recursive DPs are possible.

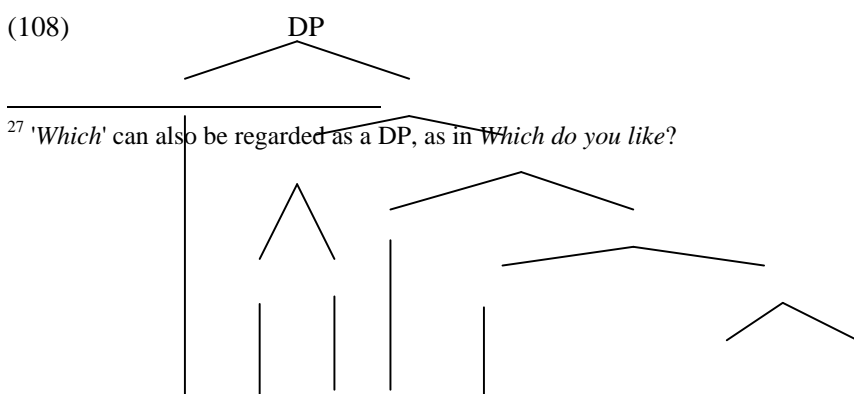
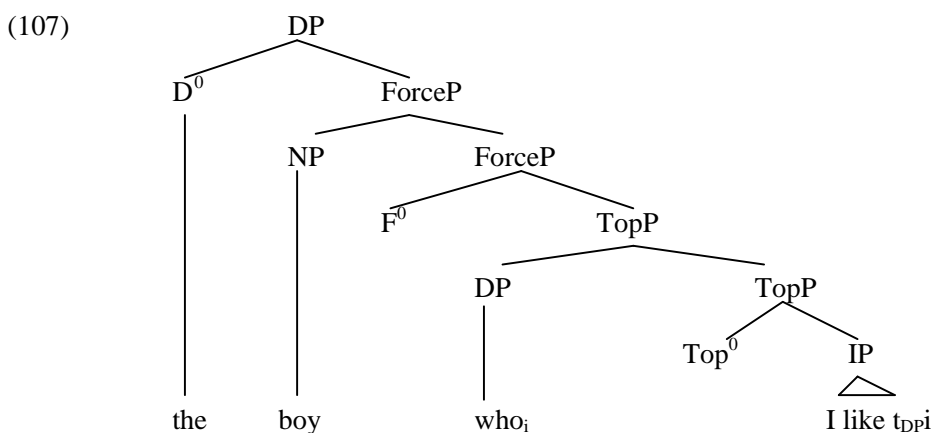
²⁶ In our analysis, the matching relation between the Head nominal and the operator is encoded in a predication or agreement relation between the Head and the operator, which is derived from the need to license the operator in a relative clause.



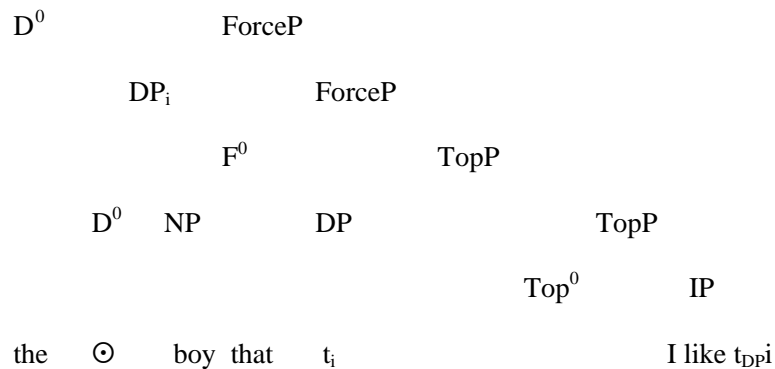
In the cases with *why*, *where*, *when* such as (106), it is not clear how, structurally, these *wh*-words can fit into the structure of (101). It is not clear why an NP should be selected by these *wh*-words, which would have been impossible in all other contexts (for example, we do not otherwise have expressions such as *why reason*, *where place*, *when time*, etc.), in order to be raised to the Spec of ForceP.

- (106) a. the reason why he did not come
 b. the place where he ate
 c. the time when he ate

Clearly, the structure and derivation illustrated above need to be revised. Note that independently, *who* itself is a DP, which has substantive features such as [+human], which generally are situated in N, D being the location for grammatical features such as definiteness. Other *wh*-words such as *why*, *how*, *when*, *where* are XP categories as well, as they can occur in XP positions.²⁷ These *wh*-words do not select a lexical NP. Accordingly, we propose that what occupies the Spec of TopP is simply the *wh*-word, such as *who*, *why*, *where*, *when*, *which*, etc. This move is in line with Chomsky's (1977) original suggestion that relativization is derived by the movement of a *wh*-operator to (the Spec of) Comp. The *wh*-word is an operator predicated of the Head NP in the Spec of ForceP position. In other words, in contrast to the structure in (101) where the NP in the Spec of ForceP is moved from within the DP in the Spec of TopicP, we suggest that the NP is not moved from within the *wh*-phrase. If it is not moved there, it must be base-generated there. It is base-generated in the Spec of ForceP and a *wh*-operator occupies in the Spec of TopicP. The NP is the Head of the relative construction and enters a predication relation with the *wh*-operator or an agreement relation (see, Chomsky (1977), Safir 1986, Browning 1987). That is, English should have two types of relative structures: (107) and (108).



²⁷ 'Which' can also be regarded as a DP, as in *Which do you like?*



(107) differs from the structure adopted by Bianchi (101) in the following two respects: the NP in the Spec of ForceP is base-generated in this position, rather than moving there. What occupies the Spec of TopP is a *wh*-operator without an NP selected by *wh*.

The modification of (101) as in (107) solves the problems mentioned above. We, now, do not need to assume that [*who* NP], [*why* NP], [*where* NP], [*when* NP] etc. must be generated for the sole purpose of deriving *wh*-relatives. We do not need to stipulate that [*which* boy] cannot be generated for the purpose of relativization. We do not need to assume that the derivation and structure in (102)-(103) is possible only when the NP in [*which* NP] is [-human]. More importantly, compared with (101), the structure in (107) captures the interesting empirical generalization noted earlier concerning the distinction between *that*-relatives and *wh*-relatives.

Note that (107) contains a Head that is base-generated, with which a *wh*-operator stands in a predication/agreement relation. The Head is not related to the gap in the relative IP via movement. Accordingly, we would expect English *wh*-relatives, in contrast to *non-wh*-relatives, to not exhibit reconstruction effects involving the Head. This would contrast with the prediction of the promotion analysis (101), where a two-step derivation applies to derive the *wh*-relative. Under the copy and merge theory of movement, the Head NP should exhibit reconstruction effects: the full representation of the sentence in (101), for instance, should be like the one below, where a copy of the NP appears in the argument position inside the IP:

(109) [DP the [_{ForceP} [NP boy]_j [_{ForceP} F [_{TopP} [who [boy]_j]_i [_{IP} I like [who boy]_i]]]]]

The reconstruction facts as shown in the previous section argue for the structure in (107), rather than (101).

In brief, we have shown that relative clauses should be distinguished into two types: those derived by Head-raising and those derived by operator movement. The latter are realized as *wh*-relatives and adjunct relativization in English and the former, *non-wh*-relatives of argument relativization. Both types of relative constructions can be accommodated by a complementation structure. An adjunction structure is, therefore, unnecessary.²⁸

Extending further the discussion on the distinction between a Head-raising analysis and an operator analysis, we show below that Head-raising is not always available in English, either.

²⁸ The complementation structure can also capture the facts regarding the LA relative constructions, which are also Head-initial and which are also derived by either Head-raising or operator analysis. The only difference between English and LA lies in the fact relative operators in LA are not *wh*-expressions.

There are certain relativization cases that require operator movement.

4.5. Adjunct relativization

Recall that our analysis indicates two derivations for relative constructions: movement of a DP with an empty D to the Head position as in (107)) or movement of an operator to stand in a predication/agreement relation with the base-generated Head as in (108). For the former, the empty determiner of the DP will be adjacent to the external D and be licensed by it. The two determiners behave like two in one and, therefore, the relation between the NP and the internal determiner can be taken as the relation between the NP and the external determiner. The external determiner, accordingly, is properly interpreted. This predicts that, if what is moved is not a DP, hence does not contain an empty D, the derivation will crash since the external determiner will not have an NP to be interpreted with. The Head-raising analysis, then, cannot be adopted for such constructions. Reconstruction of the Head should, then, not be available. This should be so regardless of whether a *wh*-pronoun is used overtly. Even if a *wh*-pronoun does not occur overtly, the relative construction is still derived by movement of an operator, not by direct movement of the Head. This is indeed the case with typical adjunct relativization.²⁹ Such relative constructions do not allow reconstruction at all:

- (110) a. *We accepted [[the reason of his_i own choosing] [that every student_i was late e_j].
b. *We imitated [[the way advocated by his_i father-in-law] [(whereby) every mechanic_i fixed the car e_j]].³⁰

Such an analysis of relative constructions makes a further prediction: even when a relative clause does not contain a *wh*-pronoun in adjunct relativization, it should still behave like a *wh*-island (cf. (95)-(96)). Again, this prediction is borne out. In the following pair of sentences, argument relativization can be derived by Head-raising, which does not involve a *wh*-operator. In contrast, adjunct relativization is derived by *wh*-operator movement and constitutes a *wh*-island:

²⁹ The judgement varies with the cases containing *when* and *where*, which is not surprising. These are more argument-like phrases. It is possible that the apparent PPs corresponding to *when* and *where* are simply Case assigners. Real Ps do not allow the use of *when* or *where*:

- (i) a. the days when he studied
b. *the days when he studied during
c. *the days during when he studied
d. the days during which he studied

Where can even function like a nominal by occurring in the object position of a P:

- (ii) the place from where he ran for help

³⁰ Larson (1985) observes that, when the relative clause contains a trace in an adjunct position, the Head is a bare NP-adverb:

- (i) a. the way_i [that you talk t_i]
b. *the manner/fasion [that you talk t_i]
c. You talked that way.
d. *You talke that manner/fashion.

This is peculiar to *how* expressions and *why/reason* expressions behave differently. It is not clear why there is such a difference.

- (111) a. Who introduced the man that talked about what?
 b. ??Who introduced the man who talked about what?
 c. ??Who did it the way that John did what?
 d. ??Who wrote to John for the same reason that Bill wrote to whom?
 e. ??Who wrote to John for the same reason why Bill wrote to whom?
- (112) a. Who believes John bought what?
 b. ??Who wonders whether John bought what?
 c. ??Who wonders how John did what?
 d. ??Who wonders why John did what?

4.6. Summary

Beginning with the two competing analyses for relative constructions, this chapter showed that both the promotion (Head-raising) analysis and the matching (*wh*-operator movement) analysis are necessary to derive different sub-patterns of relative constructions. The need for both analyses is forced by different facts regarding reconstruction possibilities:

- (113) i. Head reconstruction available: LA definite relatives, English non-*wh* relatives with type I determiners --- Head-raising
 ii. Head reconstruction unavailable: LA indefinite relatives, English *wh* relatives, English non-*wh* relatives with type II determiners --- matching analysis

The different reconstruction possibilities indicate that Head-raising is available to derive the constructions listed in (113)i) but not (113)ii). The latter is derived by *wh*-operator movement in contexts that allow movement.

The choice of derivations of relative constructions depends on what is generated as the phrase to be relativized: either a DP with an empty D or a *wh*-DP.

- (114) the phrase to be relativized:
 i. DP with an empty D
 DP undergoes movement for the empty D to be licensed. Licensing is successful in the constructions listed in (113)i) but not (113)ii).
 ii. *wh*-DP
 Wh-DP undergoes operator movement, coindexed with a base-generated Head.

Although the Head-raising option of (114)i) is available only to the constructions listed in (113)i), the *wh*-movement option of (114)ii), in principle, should be available not only to the constructions listed in (113)ii) but also those in (113)i). The effect of an alternative derivation for (113)i), however, is vacuous.

Fundamentally, then, what determines the derivation of a relative construction lies in the choice of the phrase to be relativized, as in (114). The morpho-syntactic behavior of such phrases determines what is moved and what is reconstructed.