The derivation of relative clause constructions within generative grammar

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1.   Introduction

This paper deals with the derivation of restrictive relative clause constructions in English.[1] The discussion will be presented within the theoretical framework of Generative Grammar, and more specifically within the model of grammar that is generally referred to as "Government and Binding (GB) theory".[2] The focus will be on the various GB mechanisms that are involved in the derivation of restrictive relative clauses. An example of such a clause is given in (1). In this sentence the relative clause is introduced by the relative pronoun *which*. As indicated by the subscripts, this pronoun stands in a coreferential relationship with the subject of the main clause, *the book*, the latter representing the antecedent of the pronoun. (Here and below, the relative clause is given in square brackets and the relative pronoun in bold.)

(1)   The book$_i$ [**which**$_i$ Peter will read] belongs to Mary.

The rest of the discussion is organized into two main sections. Section 2 focuses on *wh*-movement, the core mechanism involved in deriving relative clauses. This rule serves to raise the relative pronoun, e.g. *which* in (1), out of its original underlying position into a new clause-initial position, that is, a position in the left-periphery of the

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[1] In Alshabani (2017) I discussed the various similarities and differences between three types of relative clause with reference to examples from English, namely restrictive relative clauses, non-restrictive relative clauses and free relative clauses. Below is a brief characterisation of each type. Firstly, restrictive relative clauses serve to restrict the set of members to which a particular nominal expression refers, as in (i) (the relative clause is given in brackets).

(i)   The girl [**whom** you know] owns the restaurant.

Secondly, a non-restrictive relative clause does not restrict the set of members to which a particular nominal expression refers, but rather provides addition information. Typically, this type of relative clause is phonologically separated from the antecedent of the relative pronoun, as indicated by the use of separation markers such as commas or brackets in written language.

(ii)   John, [**who(m)** you met last week], is a good friend of mine.

Thirdly, free relative clauses are characterised by the fact that the relative pronoun appears to be antecedentless in that it doesn't refer back to any overt constituent in the sentence:

(iii)   [**What** she meant] is unclear.

[2] GB-theory was the most influential model of grammar during the 1980s and early 1990s. For the main assumptions, modules and devices of GB-theory, cf. e.g. Chomsky (1981, 1985); Haegeman, Hornstein, Nunes & Grohmann (2005), Ouhalla (1999).

clause. In the course of the discussion attention will be given to the nature of the raising operation, and also to the specific position to which raising takes place. Section 3 focuses on several constraints on *wh*-movement, in particular constraints on the type of construction out of which raising may take place, as well as the doubly filled COMP filter which limits the surface distribution of raised relative pronouns. The findings of the investigation are presented in section 4, the concluding section.

2.   A generative analysis of restrictive relative clauses

This section describes the main movement operation that is involved in the derivation of restrictive relative clauses, namely *wh*-movement. To start, section 2.1 describes the role that this mechanism plays in the derivation of *wh*-questions in English. In the course of the discussion, attention will be given to the expressions that can undergo *wh*-movement as well as their landing site, that is, the position into which they are moved. Against this background, section 2.2 focuses on the application of *wh*-movement in the derivation of restrictive relative clauses.
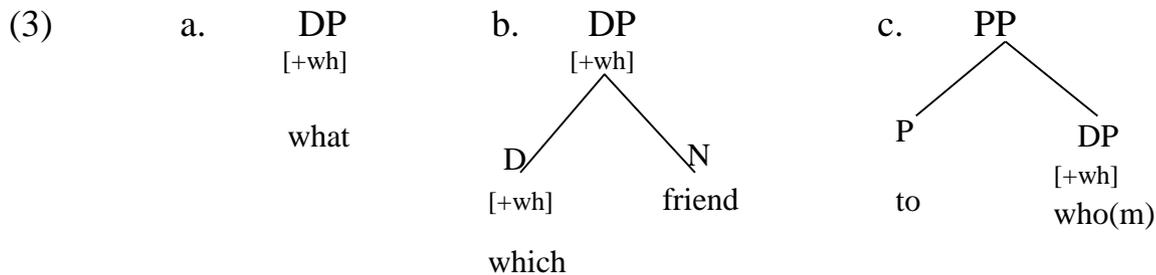
2.1   Wh-movement in the derivation of questions

Wh-movement is the core mechanism involved in the derivation of non-echo *wh*-questions, that is, interrogative sentences that cannot be answered with a simple "yes" or "no". Examples of such sentences are given in (2) below.

(2)   a.   [**What**] will they eat?
        b.   [**Which** friends] have you invited to the party?
        c.   [**Who(m)**] have you given the book to?

These sentences all contain a (bracketed) *wh*-expression, that is, a phrase that has a *wh*-word (or question word) as one of its constituent parts. The set of *wh*-words in English includes the pronouns or pronoun-like elements *what, who(m), which, whose, when, where* and *how*. *Wh*-words are commonly described as carrying a particular grammatical feature, namely [+wh], which distinguishes them from non-*wh*-elements. In both (2a,b) the *wh*-phrase represents a nominal expression, which is generally analysed as a determiner phrase (DP). In (2c) the *wh*-expression is included in a prepositional phrase (PP). The structure of the three *wh*-phrases in (2) can be represented in simplified form as in (3a-c), respectively. Note that the *wh*-word *what* in (2a), which is conventionally analysed as a D, simultaneously represents the head and the maximal projection of the *wh*-phrase; the noun *friends* in (2b) likewise simultaneously represents the N head of the NP and the NP itself.

Furthermore, in each of the phrases in (3) the [+wh] feature carried by the *wh*-word percolates to the phrase headed by this word.[3]

(3)   a.   DP
              [+wh]

              what

       b.   DP
              [+wh]

              D   N
              [+wh]   friend

              which

       c.   PP

              P   DP
                             [+wh]
              to   who(m)

In all the examples in (2), the *wh*-phrase occurs in clause-initial position. However, in each case this represents a derived position, that is, not the position which it initially occupied in the structure. In both (2a,b) the *wh*-phrase represents the direct object argument of the verb, which means that it initially entered the structure as the complement of the V. The structure underlying the sentence in (2a), for instance, will thus be along the lines in (4). As illustrated by means of the arrows in (4), the derivation of the sentence in (2a) involves two movement operations: (i) the modal auxiliary *will* is moved to a position to the left of the subject DP *they*; (ii) the *wh*-phrase *what* is moved into sentence-initial position. The mechanisms responsible for the respective movements are conventionally referred to as Inversion and *Wh*-Movement.[4]

(4)   CP

       C   TP

       DP   T'

              T   VP

                     V   DP
   [+wh]

       they   will   eat   what
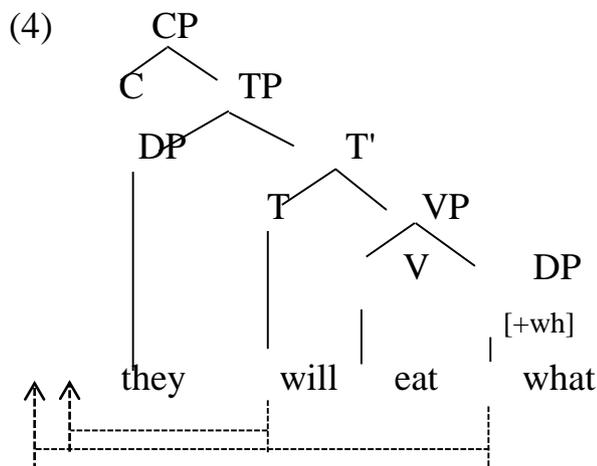
The PP containing the *wh*-phrase in (2c) likewise enters the structure in some position to the right of the V since it functions as the indirect object argument in the sentence. The structure underlying (2c) may therefore be represented as in (5). The same two operations that were applied in the derivation of (2a), also feature in the case of (2c),

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[3] For more discussion about feature percolation, cf. e.g. Cowper (1984), and Haegeman (1994:374).

[4] For more discussion of Inversion and *Wh*-Movement, cf. e.g. O'Grady, Dobrovolsky & Katamba (1996:203-204) , Haegeman (1994:371-372) and Radford (2004:188-189).

as shown by the arrows in (5). Note that the *wh*-phrase is moved out of the PP, with the head of the PP that is the P *to*, staying behind. This phenomenon is generally referred to as "preposition-stranding".[5]

(5)
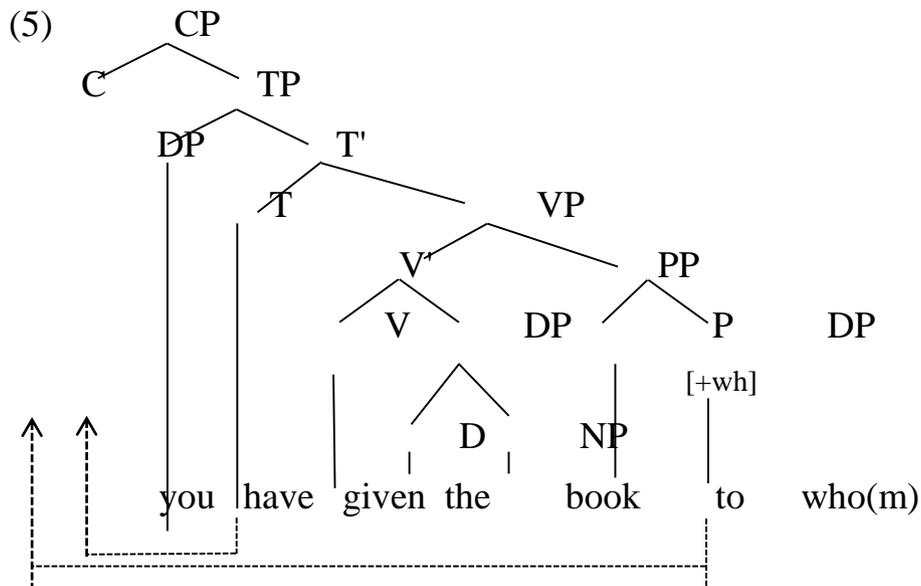
In English, it is also possible for a preposition to be fronted along with its *wh*-complement, a phenomenon known as "pied piping". In the case of (5), for instance, the PP containing the *wh*-phrase *who(m)* can be fronted as a whole, with the P *to* also being raised:

(6)   <u>To who(m)</u> have you given the book __?
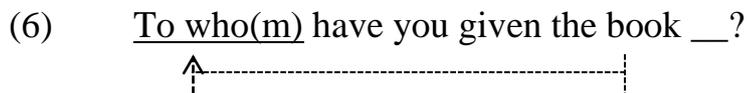
The question that now arises concerns the landing sites of the elements affected by Inversion and *Wh*-Movement, that is, the positions into which the relevant elements are moved. Consider, firstly, the landing site of fronted auxiliaries such as the modal and aspectual auxiliaries in the examples in (2) and (6). It is generally assumed in the literature that Inversion moves elements into a position in the complementiser domain of the clause, in other words, into a position within the CP. In the case of (5), for example, the auxiliary *have* would be raised into the phonetically empty C position, an instance of head-to-head movement, also referred to as "T-to-C raising". In standard varieties of English, this operation is restricted to the derivation of direct questions (also referred to as "root questions") such as those in (2) and (6). To put it differently, Inversion is not applied in the derivation of indirect questions (or "embedded questions"), at least in standard

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[5] For the phenomenon of preposition stranding, and also pied-piping (see below), cf. e.g. Haegeman (1994:375) and Radford (2004:211-217).

varieties of English, as illustrated by the difference in grammaticality between the examples in (7) (the embedded clauses are given in brackets).

(7)   a.   I know [**what** they will eat _]

     b. *I know [**what** will they _ eat _]0

Consider, secondly, the landing site targeted by *Wh*-Movement. As shown in (5), the *wh*-phrase is raised into the leftmost position of the clause, occurring directly before the fronted auxiliary. Given that the auxiliary in sentences like those in (2) and (6) occupies the C position, it follows that the *wh*-phrase is raised into the specifier position of the CP ([spec, CP]).[6] The structure that is derived by Inversion and *Wh*-Movement in the case of (2a) could thus be represented in highly simplified form as in (8).

(8)
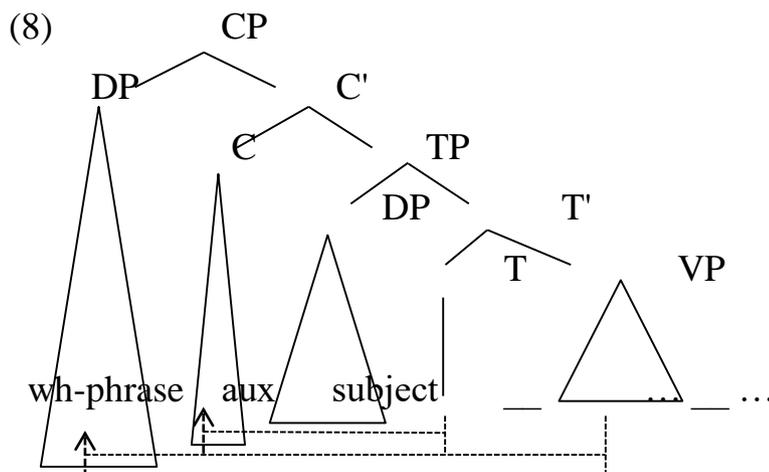
In all the examples discussed thus far, the *wh*-phrase undergoes "short movement" in the sense that its landing site and the position in which it was initially generated both form part of the same clause. It is however possible for a *wh*-phrase to be moved out of one clause into the C specifier position of a next higher clause, as illustrated in (9). In this example the *wh*-phrase *what* originates as the direct object complement of the verb *eat* in the (bracketed) subordinate clause.

(9)   What did you say [CP that you will eat _]?

The derivation of the sentence in (9) involves three movement operations. Firstly, the *wh*-phrase *what* is moved to the specifier position under the CP of the subordinate clause, as shown in (10). Notice that Inversion is not applied in the subordinate clause,

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[6] For more discussion of the landing site of *Wh*-Movement, cf. e.g. Baltin (1982:17-22), Haegeman (1994:376-381), Koopman(1997:26), Ouhalla (1999:72-80), O'Grady et al. (1997:211)and Radford (2004:204-206),

since the C position is already filled by the complementiser *that*; the auxiliary *will* thus remains in its original position to the right of the subject *you*.

(10)   You did say [CP **what** that you will eat _]

The next two steps in the derivation involve moving the *wh*-phrase into the [spec, CP] position of the main clause, and raising the auxiliary *did* into the C position:

(11)   [CP what [C did]] you _ say [CP _ that you will eat _]

It was noted above that the auxiliary in the subordinate clause in (11) does not undergo Inversion since the C is already filled by the over complementiser *that*. In standard varieties of English, a *wh*-phrase may also not co-occur with an overt complementiser. In other words, [Spec, CP] is ruled out as the final landing site for such a phrase if the head of the CP is filled by a complementiser, as illustrated by the ungrammaticality of the sentences in (12). This constraint on *Wh*-Movement is referred to in the literature as the Multiply (or Doubly) Filled COMP filter.[7] Note that (11) is not ruled out by the filter since [Spec, CP] of the subordinate clause is an intermediate landing site for the *wh*-phrase, not the final one.

(12)   a.   *He told me [**what** that he wanted to eat _]
         b.   *I wonder [**which** book whether he will buy _]

In earlier versions of generative grammar, the operations performed by movement rules were subject to various grammatical constraints (or conditions).[8] In GB-theory, many of these were subsumed under a single constraints known as the Subjacency condition on movement. Haegeman (1994:402) states this condition as follows:

(13)   Movement cannot cross more than one bounding node, where **bounding nodes** are IP and NP [i.e. TP and DP, respectively, in more recent generative works – SA].

To illustrate the effect of Subjacency, consider the following example adapted from Haegeman (1994:403) (where t represents the trace (or, in more recent studies, the copy) of the fronted *wh*-phrase *how*):

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[7] For the Multiply (or Doubly) Filled COMP filter, see e.g. Haegeman (1994:373-383), Koopman (1997:17-20) and Radford (2004:230-231). It should be noted, however, that some non-standard varieties of English do allow a *wh*-phrase to co-occur with an overt complementiser, as shown in the examples below:
(i)   a.   I wonder [which dress that she choose to wear]
          b.   I don't really know [what kind of man that he is]
[8] For discussion of constraints/conditions on movement operations, cf. e.g. Baltin (1982), Chomsky (1973), Ross (1967), and Radford (2004).

(14)   [CP1 how did [TP1 you say [CP2 that [TP2 Jeeves thinks [CP3 that [TP3 Lord Emsworth
                                                                        will solve this problem t

]]]]]]?

In sentence (14) the *wh*-phrase *how* is moved out of the lowest CP, CP3, and ends up in the leftmost position of the sentence, that is, in [Spec, CP1]. In the process, the *wh*-phrase crosses three bounding nodes, namely the lower TP3, the middle TP2, and the matrix TP1. In terms of Subjacency, however, movement may cross at most one bounding category, which means that a single long-distance movement operation as indicated by the arrow in (14) is ruled out by this constraint. In order to account for the grammaticality of (14), it is proposed that fronting of the *wh*-phrase involves three shorter movements instead of a single long one. First, the *wh*-phrase is raised to [Spec, CP3], crossing one bounding node, TP3. Next, the *wh*-phrase is raised from [Spec, CP3] into [Spec, CP2], again crossing only one bounding node, TP2. Finally, the *wh*-phrase is raised into [Spec, CP1], crossing only the bounding node TP1. Subjacency is therefore not violated by any of the three applications of *Wh*-Movement, which accounts for the grammaticality of the sentence. The derivation can be represented as in (15); note that Inversion of the auxiliary *do* also took place in the main clause. In each movement operation, a trace/copy of the moved phrase stays behind in the position from which movement takes place.

(15)   [CP1 how did [TP1 you t say [CP2 t that [TP2 Jeeves thinks [CP3 t that [TP3 Lord

                            Emsworth will solve this problem t]]]]]]?

Consider in contrast the ungrammatical sentence in (6).

(16)   *How do you think which problem the students will solve?

This sentence contains two *wh*-phrases, *how* and *which problem*. The *wh*-phrase *which problem*, on the one hand, was raised into the [Spec, CP] position of the subordinate clause. This operation is allowed in terms of Subjacency since only one bounding node is crossed, namely TP. On the other hand, the *wh*-phrase *how* was moved into the [Spec, CP] position of the main clause. Note that this phrase cannot first be raised in the specifier position of the subordinate clause CP, since this position is already filled by the wh-fronted expression *which problem*. This means that how has to be raised in one step from its original position in the subordinate clause into its eventual landing site in the main clause. In the process, two bounding nodes would be crossed, namely the TP

of the subordinate clause and the TP of the main clause, as shown in (17). Since this constitutes a violation of Subjacency, the sentence is ruled out as ungrammatical.

(15)   *[CP$_1$ how do [TP$_1$ you t think [CP$_2$ which problem [TP$_2$ John could solve t t]]]]]?
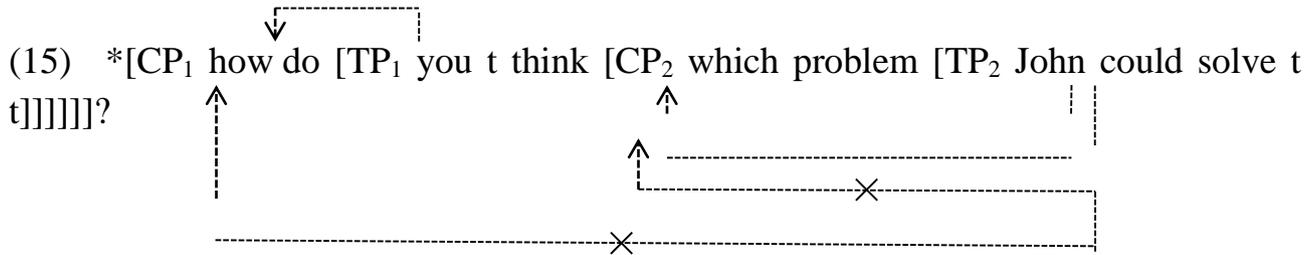
Having briefly discussed the role of *Wh*-Movement in the derivation of *wh*-questions, we turn our attention next to the application of this rule in the derivation of restrictive relative clauses.

2.2   Wh-movement in the derivation of restrictive relative clauses

This section deals with the derivation of restrictive relative clause constructions in English. A restrictive relative clauses serves to restrict the set of members to which a particular nominal expression refers (see Alshabani 2017 and the references cited there).[9] Examples of such clauses are given in (16). In (16a) the relative clause is introduced by a relative pronoun and in (16b) by the complementiser that; (16c) contains neither a relative pronoun nor a complementiser. (Here, and below, the relative clause is given in square brackets and the relative pronoun in bold.)
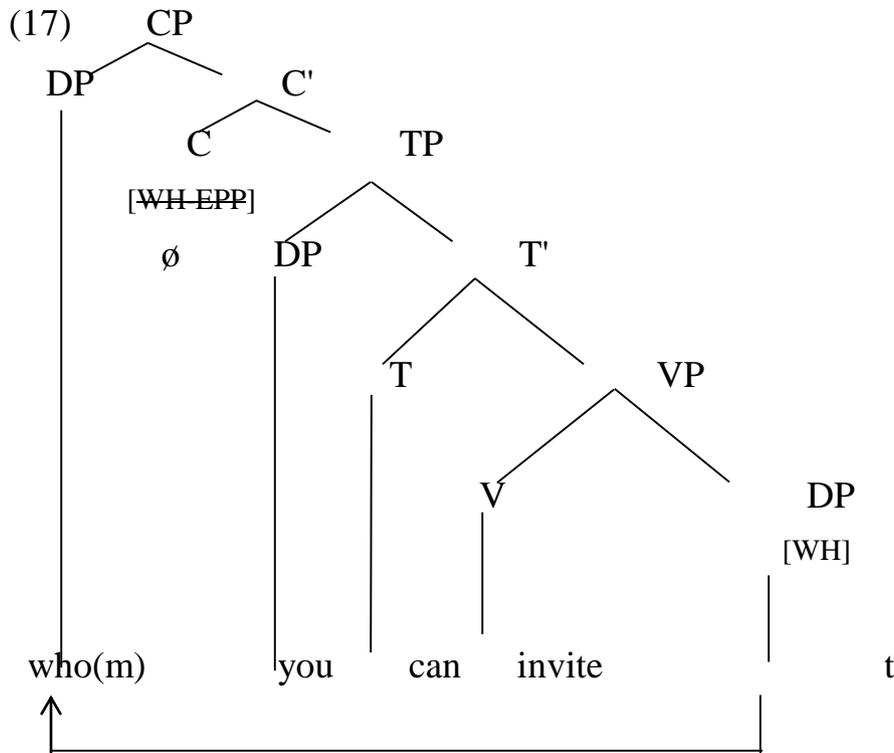
(16)   a.   I know someone [**who(m)** you can invite]

       b.   I know someone [that you can invite]

       c.   I know someone [you can invite]

It is generally assumed in the generative literature that a relative clause such as the one in (16a) is derived by means of *Wh*-Movement. In this case, the relative pronoun *who(m)* represents the direct object argument of the verb *invite*. This implies that the pronoun initially occupies a position directly to the right of the verb. In the course of the derivation, the DP *who(m)* is raised by *Wh*-Movement into the specifier position of the CP, leaving behind a trace (or copy) of itself in the vacated position. This operation is illustrated in the structure in (17).[10] According to Radford (2004:240), the C indicated as ø in (17) is "perhaps a null counterpart of *that*" which carries a [WH-EPP] feature that triggers the application of *Wh*-Movement.[11]

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[9] For restrictive relative clauses, see also footnote 1.

[10] As pointed out in section 2, Inversion does not apply in subordinate clauses in standard varieties of English. The modal auxiliary in (17) is accordingly not raised into the C position.

[11] Radford (2004:239-240) states that the EPP (Extended Projection Principle) specification carried by the *wh*-feature of the C in (17) "obliges it [i.e. the C – SA] to extend a specifier", with the *wh*-feature serving to attract "the closest maximal

(17)

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            CP
         /      \
       DP        C'
        |      /    \
        |     C       TP
        |  [WH EPP] /    \
        |    ø    DP       T'
        |         |      /    \
        |         |     T      VP
        |         |     |    /    \
        |         |     V   DP
        |         |     |  [WH]
      who(m)     you  can invite    t
        ↑_____|
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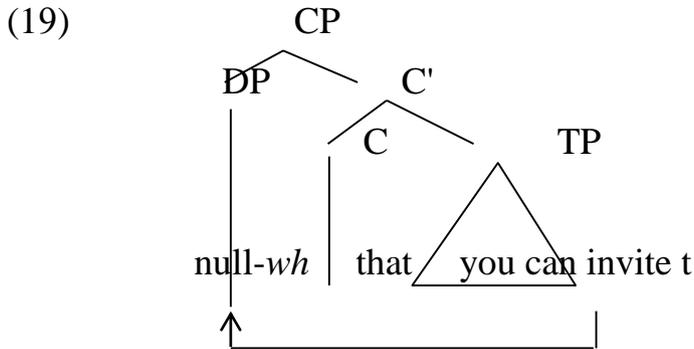
As discussed in section 2, if the *wh*-phrase represents the DP complement of a preposition, *Wh*-Movement can front either the DP on its own, leaving behind the preposition (i.e. prepostion stranding), or the preposition can be pied-piped together with the raised wh-DP. This phenomenon is also found with relative clauses introduced by a *wh*-relative pronoun:

(18) a. I know someone [**who(m)** you can give the book to _]

b. I know someone [**to who(m)** you can give the book _]

According to the Relative Pronoun Spellout Condition put forward by Radford (2004:239-240), a *wh*-fronted relative pronoun occurring in the specifier position of a relative clause can optionally have a null spellout in the phonological component. This condition would then account for the example in (16c) above: although *Wh*-Movement was applied in the derivation of the relative clause in this sentence, the wh-fronted relative pronoun occurs in covert form. Note that the relative clause in (16b) also lacks an overt relative pronoun; in this case the clause is introduced by the complementiser *that*. If the derivation of relative clauses always involves the application of *Wh*-Movement, the structure of the relative clause in (16b) would be along the following lines (where "null-*wh*" represents the covert *wh*-expression):

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projection containing a *Wh*-phrase to move to spec-CP"; in the process the C's feature is erased. For more discussion of the EPP, cf. e.g. also Castillo (2003:31) and Ouhalla (1999:124-126).

(19)

```
                    CP
             DP           C'
                      C        TP

        null-wh   that   you can invite t
           ↑_____|
```

It is generally assumed in the generative literature that the relative pronoun *that* such as the one in (16b) behave in much the same way as other pronouns like *which*, *who*, etc. However, an alternative analysis is to take *that* to be a relative clause complementiser (Radford 2004:228).[12] On such an analysis, the relative pronoun *that* represents the direct object argument of the verb *invite*. In the course of the derivation, *that* is raised by *Wh*-Movement into the C-position, leaving behind a trace (or copy) of itself in the vacated position. According to Radford (2004: 228-231), this analysis can account for several properties of relative *that*. Firstly, in contrast to a *wh*-pronoun the relative pronoun *that* can only introduce a finite relative clause like the one in (16b) above, not an infinitival relative clause as shown by the ungrammaticality of the example in (20).

(20)   *The boys are looking for place [**that** to play football]

Secondly, the relative pronoun *that* is invariable in form; for instance, it does not take different case forms in contrast to, for example, the relative pronoun *who* that takes the genitive case form *whose*:

(21)   *I know the boy [that's book was stolen]

Thirdly, dissimilar to *wh*-pronouns, the relative pronoun *that* does not allow pied-piping of a preposition as shown by the difference in grammaticality between the sentences in (22).

(22)   a.   I know the girl [**that** you gave the book to _]

       b.   *I know the girl [**to that** you gave the book _]

Fourthly, it was pointed out in section 2 that a *wh*-phrase cannot co-occur with an overt complementiser. This constraint is expressed by the Multiply (or Doubly) Filled COMP filter. If the element *that* in a relative clause such as (16b) and (22a) represents a relative pronoun, this constraint should therefore rule out sentences

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[12] For *that*-relatives cf. also e.g. Haegeman (1994:390) and Ouhalla (1999:77-81).

where *that* co-occurs with a complementiser. This is indeed the case, as illustrated by the ungrammaticalty of the example in (23) containing *that* in the specifier position of the complementiser *for*.

(23)   *He recommended someone [**that** for you to talk to _]

3.   Summary

This paper dealt with the phenomenon of relative clause constructions. More specifically, the focus was on the derivation of restrictive relative clause constructions in English. The discussion was presented within the theoretical framework of (GB) theory, and was organized into two main sections: Section 2 examined the role of *Wh*-movement in the derivation of questions, with some attention given to some of the constraints on this operation, including Subjacency and the Multiply Filled Comp Filter. Against this background, section 3 dealt with the role of *Wh*-Movement in the derivation of restrictive relative clauses in English. It was found that this operation takes place in exactly the same manner as with the derivation of questions. In the course of the discussion attention was also given the proposal by Radford (2004) that the element that in English can be analysed as a relative pronoun in the cases where it introduces a relative clause.

Having provided a description of the facts of relative pronouns and relative clauses in English, specifically the syntactic distribution of relative pronouns, the question that remains is how the coreferential relationship between a relative pronoun and its antecedent can be accounted for. This question has not received systematic attention in the generative literature, and is left as a topic for further investigation.

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