

*I-to-C movement and the that-t Filter**

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1 Introduction

The purpose of this paper is to provide an account of the so called *that-t* and anti-*that-t* effects. The former appears in languages like English when subject extraction takes place out of a complement clause. In order to avoid the *that-t* effect the Complementiser has to be realised as zero. The anti-*that-t* effect on the other hand appears in constructions such as subject relatives where the presence of the complementiser is obligatory (at least in Standard English) otherwise the result is ungrammatical.

The paper is organised as follows: in section 2 I present the data and discuss some of their main properties. In section 3 the *that-t* effect and the various proposals that have been put forward will be discussed. In particular I will argue that the *that-t* effect as a violation of the head-government condition of the ECP (cf. Rizzi 1990, Law 1991) is not desirable both on conceptual and empirical grounds. In section 4 I will propose an alternative within the Minimalist framework of Chomsky (1992) and most crucially of Brody (1992/93). Assuming that Complementisers are expletives (Law 1991) there are two possible chains to be formed: the expletive chain and the "trace" chain. I will argue that the latter is the only possible one in subject extraction out of a complement clause. In section 5 the anti-*that-t* effect and the problems associated with the various proposals that have been put forward will be discussed. Finally in section 6 I will propose an account of the anti-*that-t* effect in terms of short movement. I will provide evidence from other constructions that involve short subject movement and I will consider some of the theoretical implications this analysis has with respect to movement in general.

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2 Subject movement: the data

Consider the following examples in English:

- (1) Who do you believe (*that) left?
- (2) Who do you believe (that) Peter met?

In (1) subject extraction is allowed as long as the complementiser *that* is absent. In (2) on the other hand object extraction is allowed irrespective of the presence of the complementiser. Subject/object asymmetries of that type arise in other constructions as well, such as relative clauses, where actually the pattern attested with respect to subject extraction is the reverse from the one in (1) above:

- (3) The man *(that) left is my neighbour.
- (4) The man (that) you saw is my neighbour.

In object relatives, as in (4), the complementiser is again optional. In subject relatives, however, *that* has to be present obligatorily. Notice that the subject/object asymmetry exemplified in (3)-(4) above is also found in Norwegian (Taraldsen 1986a):

- (5) Vi kjenner den mannen *(*som*) snakker med Marit.
"We know the man that is talking with Mary."
- (6) Vi kjenner den mannen (*som*) Mari snakker med.
"We know the man that Mary is talking with."

Norwegian distinguishes between two complementisers: *at* introduces complement clauses while *som* occurs in relative clauses. *Som* furthermore is similar to *that* in that it is obligatory with subject relatives, as in (5), but optional with object relatives, as in (6).

Extending the pattern a bit more, we notice that at least in English subject/object asymmetries of that type arise in matrix clauses as well:

- (7) Who left? (vs. *Who did leave?)
- (8) What did you buy?

It seems that in (7) I-to-C raising in the form of *do*-support cannot take place (the construction is acceptable only when *do* bears emphatic stress, but this is beyond our discussion). In (8) on the other hand, where object-movement is involved, subject-aux inversion takes place whereby *did* moves to C.

Let us now turn back to the data in (1) and (3). What these sentences have in common is that they involve a subject gap. However, in (1) where subject extraction takes place out of a complement clause, the complementiser *that* has to be absent. This is known as the *that-t* effect. On the other hand when the subject gap is within a relative clause, as in (3), *that* has to be present (the anti-*that-t*-effect). Therefore, asymmetries arise not only with respect to subjects and objects but also within subject extraction as well. In order to provide an explanation for the different patterns in (1) and (3) we have to take into consideration the different properties of the constructions in question. At a descriptive level these are as follows: (1) involves complementation, while (3) is a relative clause (which is an instance of predication). Furthermore, (1) is a case of long subject extraction, while (3) involves short subject movement: the null operator moves from the spec,IP to the spec,CP (Chomsky 1977). The question that will concern us in this paper is to what extent these properties interact with the presence of *that-t* and anti-*that-t* effects in (1) and (3) respectively.

3 *That-t* effects in complement clauses

Let us first consider subject extraction out of a complement clause, as in (1). The ungrammaticality of (1) with the complementiser present was originally treated by Chomsky and Lasnik (1977) as a violation of the *that-t* filter:

- (9) * [_S that [_{NP} e]...]

The filter in (9) was postulated to rule out *that-t* sequences. This analysis is no longer acceptable in current theories, as the phenomenon is only stipulated and no explanation is provided. Moreover, looking at this phenomenon from a crosslinguistic point of view we notice that there are languages where sequences of that type do not give rise to ungrammaticality. Leaving aside the issue of null-subject languages (cf. Perlmutter's (1971) generalisation and Rizzi's (1982) analysis), we notice that there are non-pro-drop languages that allow for subject extraction from a position adjacent to C with the complementiser present, as the examples in (10a) and (10b) below from German and Dutch respectively indicate:

- (10) a. Wer glaubst du [*daß* t das Buch gelesen hat]?
 "Who do you believe has read the book?"
- b. Wie denk je [*dat* t het gedaan heeft]?
 "Who do you think has done this?"

The two most recent accounts of the *that*-t effect that I will consider here are the ones proposed by Chomsky (1986a) and Rizzi (1990). The crucial point is that these two alternatives treat the *that*-t effect in a slightly different way. For Chomsky (1986a) the phenomenon is due to an antecedent government violation (minimality) while for Rizzi (1990) it is a (proper) head government violation.

Within the Barriers' framework Chomsky (1986a) proposed a disjunctive formulation of the ECP:

- (11) A nonpronominal empty category must be:
 (i) theta-governed, or (ii) antecedent governed

Theta-government is defined in terms of sisterhood to a lexical head (L-marking). Subjects are not theta-governed because they are not sisters to a lexical head. Therefore they need to satisfy the second clause of the ECP, that is they need to be antecedent governed. Consider now the *that*-t effect:

- (12) a. *Who did you believe [_C that [t would come]]]?
 b. Who did you believe [_C *e*] [t would come]]]?

Chomsky (op. cit.) argues that in (12a) the subject trace *t* in spec,IP fails to be antecedent-governed by *t'* in the spec,CP. The idea is that the presence of an overt *C* induces a minimality effect, i.e. *C'* counts as a minimality barrier. The *that*-t effect then is reduced to an ECP violation. In (12b) on the other hand *C* is empty (i.e. it is not lexically filled) and cannot count as a barrier to government. Therefore *t* is antecedent-governed and the ECP is satisfied, hence the grammaticality.

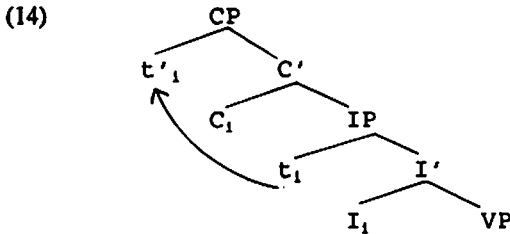
Rizzi (1990), on the other hand, argues for a conjunctive formulation of the ECP:

- (13) A non-pronominal empty category must be:
 (i) (properly) head governed (licensing) and
 (ii) antecedent governed or theta governed (identification).

Under Relativized Minimality the subject trace in spec,IP (cf. (12a)) is antecedent governed by the trace in spec,CP; therefore condition (ii) is satisfied. However, *t*

is not head-governed within the immediate projection of I. *That* -a potential head governor- does not belong to the class of proper governors; thus condition (i) of the conjunctive ECP is violated and the sentence is ruled out as ungrammatical.

Notice, however, that if *that* is absent, as in (12b), then subject extraction is possible. According to Rizzi (op. cit.) C becomes a proper governor in English when it takes its agreeing form. The idea is that when the trace moves to spec,CP agreement between C and I is triggered. I agrees with its spec under spec-head agreement, and C agrees with its spec for the same reason. The trace in spec,CP is identical to the trace in spec,IP, thus these two have to agree. By transitivity I and C will also agree:



Agreement-in-C is a language specific strategy. The agreeing form of C is realised as zero in English. In languages like French agreement of that sort is morphologically manifested (the *que/qui* alternation):

- (15) Qui crois-tu *qui*/**que* t va venir?
Who do you believe (*that) will leave?

Both accounts seem to run into problems. In the Barriers framework the problem is more general, given that if we allow an X'-projection to be a minimality barrier, in the sense specified in Barriers, then movement should be severely constrained. For example, as Chomsky (1986a) pointed out, V' should also be a (minimality) barrier. The fact that it is not has to be stipulated by saying that V' does not project, i.e we have the following structure: [VP [V].]. As for I', that also needs to be defective with respect to barrierhood in the same way that IP is. Turning now to Relativized Minimality we notice that the analysis Rizzi (1990) offers works only on the basis of the conjunctive formulation of the ECP. Notice that the definition of proper government is based on the following two notions: c-command (in the form of government within the immediate projection) plus the distinction of heads into proper and non-proper governors. However, the c-command requirement is already implicit in the second clause of the ECP, i.e the

antecedent government clause (the identification condition). In that sense it is a primitive notion of government in general; thus there is no need for it to be restated as part of the definition of (proper) head government. Let us now return to the distinction between proper and non-proper governors. Notice that in Rizzi's analysis the two classes of governors are not constrained in a principled way; for example C is inert for government in English (unless it has its agreeing form) but not in German or Dutch. If it turns out that this distinction is not desirable on both conceptual and empirical grounds, then condition (i) of the ECP in (13) will become invalid. As a consequence the account of the *that-t* effect will have to be viewed from a different perspective.

Based on the same spirit of a conjunctive formulation of the ECP, Law (1991) offers a slightly different account of the *that-t* effect. His attempt is to constrain the set of proper governors to lexical elements only, therefore excluding the presence of functional categories in that set. C is a functional element; so it does not belong to the set of proper governors. In order for the subject trace to be properly governed (under c-command) the C position will have to be occupied by a lexical element such as V at LF. Law's analysis is mainly based on the assumption that Complementisers are expletives (cf. Taraldsen 1986a). Given the Principle of Full Interpretation (FI) the Complementiser will have to be eliminated at LF. There are two ways to obtain this: (a) C deletes or (b) C is substituted. In languages like West Flemish (WF) for example where Agreement-in-C is morphologically manifested in declarative complement clauses, option (b) is adopted (examples from Haegeman (1992)):

- (16) a. Kpeinzen *da* Valere morgen goat.
I-know that-3sg Valere tomorrow go
"I know that Valere is going tomorrow."
- b. Kpeinzen *dan* Valere en Pol morgen goan.
I-know that-3pl Valere and Paul tomorrow go
"I know that Valere and Paul are going tomorrow."

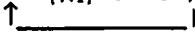
According to this analysis C and I share a set of phi-features in WF. At LF the complementiser deletes and I raises to C and substitutes for it, so that FI is satisfied.

Let us now return to subject extraction. Under the conjunctive ECP the subject trace has to be head-governed by a lexical head. At LF C deletes and I, which incorporates V, raises to C. Thus when I moves to C at LF it already contains a lexical element and therefore I qualifies as a proper governor. This explanation can account for the grammaticality of the German and Dutch examples

in (10) and the absence of the *that-t* effect in these languages. Notice, however, that this proposal as it stands makes the wrong predictions for English. Consider the following sentence:

(17) *Who you do think that t left?

The LF structure of (17) is given in (17'):

(17') Who_i do you think [_{CP} left_[V,I] [t [t_v+t_I [...]]]]


Suppose that at LF (the level at which the ECP applies) the complementiser deletes and the (V+I) complex moves to C. If this is true then the subject trace will be properly governed and therefore the sentence in (17) should be grammatical (at LF) contrary to fact. In order to explain the *that-t* effect in English Law (op. cit.) assumes that the Principle of Last Resort, which states that move α applies only to yield legitimate objects, operates and prohibits I-to-C movement. As a result the subject trace fails to be head-governed and an ECP violation arises, hence the ungrammaticality of the sentence in (17).

Consider finally the explanation of the *que/qui* alternation in French which is based on the postulation of a [+Op] feature. The assumption is that in French both I and *qui* but not *que* are specified for the [+Op] feature. At LF *qui* is substituted by I on the basis that they share a set of phi-features by virtue of the presence of the [+Op] feature and therefore head government is satisfied. Suppose that *que* is present. *Que* deletes at LF but it cannot be replaced by the (V+I) complex due to feature incompatibility. Hence the subject trace fails to be head-governed and the sentence is ruled out as ungrammatical.

Notice at this point that although Law adopts a conjunctive formulation of the ECP he differs from Rizzi (1990) in the following respects: he does not assume that it is the subject trace in spec,CP that triggers agreement. In languages where complementiser-t sequences are allowed this is interpreted as a result not of Agr-in-C in the sense of Rizzi, but of abstract (V+I) movement to C. In German for example, subject extraction out of an embedded clause is allowed given that I-to-C movement takes place. This property of German is independently present as the V-2 phenomenon in root clauses indicates. In English on the other hand the complementiser deletes at LF but the Principle of Last Resort applies and prohibits I-to-C, hence the *that-t* effect. There are however, a number of problems with Law's analysis, given that it is based on a number of stipulations. First of all why should the Principle of Last Resort apply in English only and not in other languages? Secondly, the postulation of a [+Op] feature for French but not for

English remains mysterious. Thirdly, Law posits a parameter at LF, a level which at least in current terms (cf. Chomsky (1992) among others) is not assumed to be parameterised, with regard to English by prohibiting I-to-C movement. In addition to that the operation of a Last Resort rule as the result of a language particular mechanism is postulated. Finally, Law in his analysis leaves out a very crucial point: he does not explain why (17) becomes grammatical when C is zero, or to be more precise why C has to be zero obligatorily so that the *that-t* effect is avoided.

Let us now consider the requirement for head-government more closely. As already mentioned both Rizzi's (1990) and Law's (1991) accounts are based on the notion of proper head-government. If again it turns out that the distinction between proper and non-proper governors does not exist, then their analyses will have to be reformulated. Chomsky (1992) proposes that head government is dispensed within our theory of grammar. Within the Minimalist framework only *local* relations are relevant, such as the ones that hold between a head and its complement (this is the most crucial locality relation) and between a head and its spec. This essentially follows from X'-theory and should be considered as the sole residue of head-government. The theoretical consequences are clear: no head can govern into the spec of its complement; this point is crucially related to Exceptional Case Marking (ECM) constructions. Moreover, and quite relevant to our discussion, the distinction between proper and non-proper governors ceases to exist. In other words, the distinction between lexical categories being proper governors and functional categories being defective in that respect (cf. Law 1991) is dispensed with. Each head has a privileged status with respect to its complement and its specifier. Finally, the question of a disjunctive or conjunctive formulation of the ECP does not arise: given that the head-government clause has been eliminated, what remains is antecedent government. Notice incidentally that antecedent government is relevant to chain formation (we will discuss this issue shortly). The immediate question that arises is how we are going to explain the *that-t* effect within this framework. Before I discuss in detail this issue I will consider an alternative to the conjunctive and disjunctive formulation of the ECP, namely the Locality Principle (Manzini 1992).

Suppose that the crucial part of the ECP is actually the second clause in (11) and (13), namely the one that requires antecedent government. This is subsumed under the Locality principle below (Manzini 1992):

(18) *Locality*

If α is a trace, there is an antecedent β and a sequence $(\beta, \dots, \alpha)$ that satisfies government.

Under the definition in (18) a sequence is defined as a set of coindexed positions that need to satisfy c-command. Suppose furthermore, that arguments differ from adjuncts in that the former but not the latter bear a particular relationship to a head. Manzini (op. cit.) formalises this relationship in terms of addressing:

(19) α has an address if there is a β that α is a visible argument of.

The mechanism that makes an addressed argument visible is Case-marking (or incorporation in the sense of Baker (1988)). Consider next movement, and in particular the formation of A'-dependencies. The standard assumption in the current literature is that adjuncts move spec-to-spec (cf. Rizzi 1990, Cinque 1990), i.e. they need to satisfy antecedent government; therefore adjuncts form ordinary chains. Arguments on the other hand can long move. In Locality terms A'-dependencies of arguments can be either ordinary chains or address-based dependencies. An address-based dependency is well-formed as long as the Operator and the variable are linked via a sequence of heads, starting from the head that makes the argument visible upwards. How are the intermediate heads connected? Consider for example argument extraction from the object position whereby V is the addressing head. The minimal domain of V is its spec and its complement (see Chomsky 1992). When V moves to I it forms an enlarged (minimal) domain for the chain (V+I, t_v). If the (V+I) complex relates to C as well then the minimal domain of the relevant chain extends to include C, and so on. This sequence of heads is also called an Extended CHAIN in the sense of Chomsky (1986a). Therefore in an address-based dependency it is the intermediate heads that need to satisfy antecedent government. The crucial point here is that a sequence needs to contain both the variable (the addressed argument) as well as the addressing head, i.e. the head that makes the argument visible.

Let us now consider subject extraction out of a complement clause. Suppose that when the subject moves it forms an address-based dependency. Both I (as the addressing head of the subject) and the trace in spec,IP must be included in the sequence. The problem is that I is not in a position to c-command the subject trace. Manzini at this point follows essentially the strategy proposed by Rizzi (1990): that is Agr-in-C. Suppose that C and I agree. C is also in a position from where it c-commands the subject trace in spec,IP; therefore under agreement with I it qualifies as the addressing head and can be included in the sequence. Notice that this analysis although similar to Rizzi's is not based on the notion of proper government. As was already mentioned Rizzi's (1990) definition of proper government requires both a proper governor and c-command. Recall that the distinction in proper and non-proper governors turned out to be rather problematic. Notice also that within the Locality framework head-government is replaced by

Case-marking. Moreover the c-command requirement does not have to be stated separately, since it follows directly from the Locality Principle in (18) as a well-formedness condition on dependencies. It seems therefore that this account has conceptual advantages over the one proposed in Relativized Minimality.

Having outlined some of the problems associated with the previous accounts of the *that-t* effect, I will next try to provide an alternative that follows from the notion of chains as defined in Brody (1992/93) and the Locality Principle above.

4 LF-Representations and the *that-t* effect

For the present purposes I will follow the Locality Principle as stated in (18) above. I will argue that the so called "agreement" between C and I is triggered without having movement of the subject to the spec,CP. Following Law (1991) I will assume that complementisers are expletives. Suppose furthermore that I-to-C movement is not a phenomenon restricted to root clauses only. That is I movement to C takes place in embedded clauses as well, although it may not be overt at least in most of the cases^{1,2}. At this point I will differ from Law in assuming I-to-C movement to be a universal phenomenon that takes place at LF, if not overtly. As a result the operation of the Last Resort Principle in English is no longer valid and consequently the *that-t* effect, as in (17) above, requires an independent explanation.

Suppose furthermore that we assume, following Brody (1992/93), Chomsky (1992), that there is a single level of representation. In other words the postulation of an S- and D-structure has been eliminated. The relevant level of representation then is LF. Notice that in Chomsky's minimalist model there is some sort of an intermediate level between the Lexicon and LF: the stage where SPELL OUT takes place. Before SPELL OUT movement is allowed to take place so that certain features will be checked. This is the input to PF. Strong features must be checked before the derivation reaches LF. Weak features on the other hand are invisible at

¹There are in fact some German dialects where embedded V-2 is possible albeit with the complementiser *daß* absent (Vikner 1990):

(a) Sie sagte (*daß) wir sollten keine Bücher kaufen.
 "She said (that) we shouldn't buy any books."

²We could also follow Hornstein (1990) in assuming that I-to-C movement takes place in complement clauses as a result of the sequence of tenses phenomenon. Hornstein argues that SOT takes place under government; that is the embedded I under C is in a position to enter a local relationship with the matrix V. Raising of that type is required for the temporal evaluation of the embedded clause. For the relationship between C and I see also Stowell (1982) and Enç (1987).

PF. After SPELL OUT has applied no movement occurs. Within Chomsky's minimalist framework we still allow for a derivational component in our grammar.

In the present paper I will assume the more constrained minimalist approach put forward by Brody (1992/93). According to this approach there are only the two interface levels: LF and PF. Move α is subsumed under the notion of chains. SPELL OUT then applies after LF. Notice that there is no parametric variation at LF. Parameters are associated with the morphological properties of the various languages (cf. Chomsky 1991, 1992, among others). At LF therefore all languages should look the same; in other words the chains formed will be the same at LF crosslinguistically. Consequently parameters will be defined with respect to the position we chose to SPELL OUT in the chain which in turn will be determined by the morphological properties of the language in question (cf. "The Transparency Condition: The lexical category in the chain must be in the highest position licensed by morphology" (Brody 1992: 58)).

Let us illustrate this point with the V-2 phenomenon. Suppose that I-to-C movement is a universal phenomenon required for independent reasons that I will not try to explore here. The parameter is defined as follows: in languages like German V-2 is overtly manifested in matrix clauses, while in languages like English it is not. However, for both German and English the chain formed at LF is the same: I (which incorporates V) is under C and it forms a chain with the trace in I. Thus the chain includes the following two positions: (I+C, t_i). In German SPELL OUT takes place on the C position of the chain and this is how we derive the V-2 phenomenon. In English on the other hand SPELL OUT takes place on the root position of the chain (i.e. t_i), so the V-2 phenomenon is not overt (at least in declarative sentences). In the representational model therefore the parameter is defined in terms of the positions Spelled Out in the chain. In derivational terms the case of V-2 in German would correspond to overt movement, while the English case would correspond to LF-movement³.

Let us now return to the subject extraction problem. As already mentioned at the beginning of this section under the Principle of FI the embedded C and I form a chain. On the assumption that C is an expletive the chain formed can be an expletive-argument chain, similar to the one we find in constructions of the type below:

³In Chomsky's (1992) minimalist framework this would be the result of a checking mechanism: strong features need to be checked before LF, weak features survive at PF and are checked at LF. Adopting and adapting Chomsky's analysis we could say that in English I has weak features, while in German I has strong features so we have overt I-to-C movement. The idea that I has weak features in English has also been adopted with respect to V-to-I raising.

(21) There arrived a man.

The association of the expletive *there* with the NP "a man" is required by independent reasons such as agreement. The chain formed contains the expletive and the NP. Under the Principle of FI at LF the expletive is either replaced or the argument adjoins to it (cf. Chomsky (1986b) and Chomsky (1991)). Brody (1992) argues that if move α is subsumed under the notion of chains then no replacement needs to take place. The crucial point is that the principle of FI will be respected as long as the expletive is associated with an argument, on the basis that FI does not apply to single items but to Chains (see also Brody (1992/93) for the claim that other expletives such as NP-, adjunct and head traces need to be present at LF). If this is correct then we expect that the same reasoning extends to other expletive elements such as C. As long as the expletive is associated with a contentive element the Principle of FI will be satisfied. Therefore C is associated with I, the head that carries tense features⁴.

Additionally, there is an alternative chain to be formed of the (I+C, t_i) type, whereby I is under C. Notice that this is similar to constructions like the one in (22):

(22) A man arrived.

In (22) the NP has "moved" from the postverbal position and therefore the chain formed includes both the NP and its trace, i.e. (NP_i, t_i). Let us go back to the complementiser issue. Suppose that similar to (22) when the complementiser is deleted we form the chain (I, t_i) under the operation of FI. In this case the root position of the chain is SPELLED OUT, so the C position takes the zero form. Notice that the parallelism we want to draw with respect to the examples in (21) and (22) refers to the possibility of forming two different chains: one that contains the expletive and one that contains a trace. In the "trace" chain the position that will be spelled out is determined by morphological conditions. So for example, in (22) it is the head position that is spelled out while in the parallel example with the (I, t_i) chain it is the root position. This observation, however, does not affect our analysis and its theoretical implications.

If this approach is correct then we expect that it extends not only to cases where subject extraction has taken place and the zero form is obligatory, but also in those constructions where *that* is optional, as in complement clauses or object/adjunct extraction:

⁴Alternatively the chain (that_i, I_i) can be interpreted under the requirement of temporal evaluation of the embedded clause à la Hornstein (1990) (cf. also footnote 2).

- (23) a. I think (that) Mary left.
 b. What do you think (that) Mary saw?
 c. Why do you think (that) Mary left?

Therefore the zero form in English could still be interpreted as some sort of "agreement" between C and I although in a sense different from the one specified in Rizzi (1990). Notice crucially that under our analysis, exactly as in Law's proposal, the zero form of C in English is not triggered by subject movement to spec,CP but is obtained on independent grounds as a result of the association of the C and I positions.

The question that remains to be answered is why the zero form is obligatory in subject extraction out of a complement clause. In other words why the only permissible chain is the one that includes I under C and the trace but not the expletive C and I. Recall that I as the addressing (i.e the Case-marking) head of the subject in spec,IP has to be included in the addressed-based dependency in subject extraction. In order to do so it has to c-command the subject trace. I in its original position cannot c-command its spec. However, I under C can. Thus in order for the c-command condition to be satisfied I has to be under C. As a consequence this gives rise to the zero form. If we decide to form the expletive chain, the sentence will be ungrammatical, given that I will no longer be in a position to c-command the subject trace^{5,6}.

Consider next the consequences for the French *que/qui* alternation which is manifested in subject extraction. The proposed analysis implies that the *qui* form reflects the presence of I in C. It seems that French in all the other cases forms the expletive chain, and only when it comes to subject extraction allows for the "trace" chain exactly as in English. Notice that this is quite similar to what Law (1991) proposes with the additional advantage that it does not require the stipulation of a [+Op] feature. Finally, we can provide an account for the presence of "agreement" features in C in languages like WF. According to our analysis this is the result of

⁵The alternative explanation within Chomsky's minimalist framework could run as follows: suppose that C needs to agree with I by moving the subject trace to the spec,CP. This process has to take place before LF given that agreement is a morphological condition not operative at LF. The ungrammatical sentence with *that* present implies that agreement has failed to take place before LF hence C cannot be part of the sequence (or qualify as a proper head-governor in Rizzi's (1990) terms).

⁶Within the Locality framework arguments have the option of forming ordinary chains, that is move spec-to-spec. Suppose that the subject decides to move spec-to-spec. In this case its presence in the spec, CP will trigger agreement with C under spec-head agreement which will be realised as zero (cf. Manzini 1992).

I-to-C movement which is always overtly realised on C even in declarative sentences⁷.

Having provided an account of the *that*-t effect in terms of the formation of two different chains, I will now turn to the anti-*that*-t effect and see how the proposed analysis extends to account for the phenomenon as well.

5 The anti-*that*-t effect

Consider now subject relatives in English:

(24) The man *(that) left is my neighbour.

As (24) above shows the complementiser *that* is obligatory, otherwise the sentence becomes ungrammatical. What is interesting to notice is that both in subject extraction out of a complement clause and in subject relatives (as in (24)) there is a gap in subject position. However, there is an asymmetry as far as the presence vs. absence of the complementiser is concerned.

In Chomsky and Lasnik (1977) the anti-*that*-t effect was stated as an "unless clause" of the *that*-t Filter:

(25) *_S that [_{NP}e]...

Unless S' or its trace is in the context [_{NP} NP _ ...]

According to (25) the *that*-t sequence in relative clauses is distinct from the one in complement clauses, given that it occurs in a different context, namely within an NP. Once more the rule in (25) only describes without explaining the phenomenon.

For Rizzi (1990) the question is how the head government requirement of the ECP is satisfied. I does not head-govern the subject trace within its immediate

⁷Under this analysis we can also provide an explanation to why *that* cannot delete in factive complements: if I and C agree, in the sense specified here, this implies that their specs will also agree. However, agreement between spec,CP and spec,IP cannot be obtained due to the presence of a (null) iota/definiteness operator in spec,CP (cf. Melvold 1991). Additionally we can explain why subject extraction out of a factive island will be blocked:

(a) *Who did you regret (that) left?

If I is under C from where it can c-command the subject trace, it will trigger the zero form of C. Subsequently, spec,CP and spec,IP will have to agree but this is excluded given that the subject trace in spec,IP is incompatible with the null operator in spec,CP (cf. Roussou 1993).

I leave aside the issue of why *that* does not delete in the case of complement clauses of NP's. Pesetsky (1991) offers an alternative explanation to this problem.

projection. Therefore C must count as a proper governor. As already mentioned with respect to the *that*-t effect C becomes a proper governor if it carries agreement features. According to Rizzi the complementiser *that* used in relatives is actually different from the one used in complement clauses⁸. Their distinct properties are captured in terms of a binary feature specification. In particular, *that* in relatives is specified as [-wh, +pred], while *that* in complement clauses is [-wh, -pred]. Therefore the difference is attributed to the presence vs. absence of the predicate feature respectively⁹. Notice that the null operator in relative clauses is not specified for the [+wh] feature, since it is phonetically empty, so no clash of features arises in relative clauses. Rizzi furthermore proposes that the complementiser *that* in subject relatives carries agreement features and therefore can qualify as a proper governor. The crucial point is that this is not an instance of Agreement with an A'-position (i.e. the spec,CP), given that null operators have anaphoric properties and as a consequence they do not trigger agreement, but with the head of the relative clause (the subject of predication) which is an A-position. The spell-out of C carrying A-agreement is *that* in English, *qui* in French, *som* in Scandinavian and so on. Therefore the Agreement-in-C strategy is once more chosen albeit with a different spell out in subject relatives. Thus the the ECP is satisfied.

Putting aside the requirement for head-government which turned out to be undesirable, there are some other points also that need to be clarified with respect to Rizzi's analysis. The first question is whether we actually need to postulate the presence of a [+pred] feature. Notice that predication is a syntactic/semantic notion that is acquired under a certain structural configuration. Even if *that* is specified as [+pred], we still need to get the correct structural representation (captured in terms of mutual m-command in syntactic terms) in order to derive a predication relation between an NP and a CP in this case. So the postulation of this feature turns out

⁸See also Pesetsky (1982) for the *Comp-Contraction Rule* in subject relatives from a different perspective though.

⁹Rizzi (1990) cites a number of languages e.g. Scandinavian, Hebrew etc. that distinguish between a complementiser for complement clauses and one for relatives. Notice that languages like Greek also distinguish between two complementisers: *oti* for complement clauses and *pu* for relatives. However, the complementiser *pu* is also used to introduce factive complements, so any association with predication breaks down at this point. The same holds for other languages such as Yiddish, Serbian-and-Croatian, Crio (an English Creol language) among others: the 'factive' complementiser is used in relatives as well. It seems therefore that the parallelism should probably be drawn not with respect to the presence of a [+pred] feature, but with the possible association between relatives and factives in terms of a [+definite] feature (cf. Roussou 1993).

to be redundant¹⁰. Furthermore it is not clear that it is the C position that has to agree primarily with the head of the relative (the subject of predication). In fact it is the null operator that has to be licensed under coindexation with the head of the relative clause (cf. Browning 1987). C will ultimately be coindexed with the head of the relative as a result of spec-head agreement.

Rizzi (1991a) provided an explanation of the phenomenon under a slightly different perspective without invoking the presence of a [+pred] feature. The account is based on the definition of A- and A'-positions. A-positions are specified either in terms of theta roles or in terms of agreement. Consider the C position: if C carries agreement then its spec will be an A-position. What about the status of spec,CP in subject relatives then? It will have to be an A-position on the assumption that the *that* form reflects agreement-in-C. However, the spec of CP is an A'-position as well since it hosts a (null) operator. But this leads us to a contradiction: spec,CP turns out to be both an A- and an A'-position at the same time. If this is permitted it provides no constraints on our grammar and in particular to what is possible and what is impossible. Therefore this analysis will have to be excluded on conceptual grounds.

To complete the picture let us next consider Law's (1991) account. Law argues that the complementiser *that* used in complement clauses and the one used in relatives is one and the same entity. The explanation he provides for the anti-*that*-t effect runs as follows: the relative clause is the predicate of the relative head. Following and extending proposals by Holmberg (1986) (cited in Law (1991)) and Taraldsen (1986b) Law assumes that the relative clause must be headed by a [+V] category in order for it to qualify as a predicate. When the complementiser deletes at LF, I which incorporates V raises to C in order to provide the CP with a [+V] head. As a result the subject trace in the spec,IP is properly governed. Notice crucially that the Principle of Last Resort does not apply in relatives because I movement to C is required for independent reasons. The problem that arises under this analysis is that there are predicates which are not specified for the [+V] feature. Consider the following examples:

- (26) a. Mary is [_{NP} a teacher]
 b. I consider John [_{NP} the leader of the team]

In (26a-b) the predicate is an NP: "a teacher" and "the leader of the team" respectively. It is clear that NP's are [-V]. Nevertheless, contra to what Law

¹⁰One could argue, however, that the [+pred] feature is like Agreement. Agreement is expressed both in terms of features and under the spec-head configuration.

suggests, they enter into predication as the above examples indicate. Thus the basis of Law's argument with respect to (subject) relative clauses is suspicious.

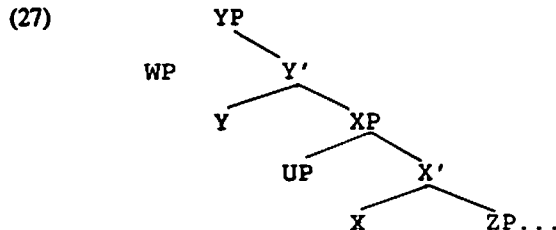
In the following section I will argue for an alternative analysis to the anti-*that-t* effect which will be based on the two types of chains that can be formed between C and I. Furthermore I will show that the anti-*that-t* effect falls under the more general phenomenon of short subject movement.

6 Short movement and the anti-*that-t* effect

6.1 The Ordering effect

In this section I will try to provide an alternative to the above proposals of the anti-*that-t* effect. Recall that under the analysis put forward in section (4) the zero form of C reflects (abstract) movement of I to C. As already mentioned this is obligatory in long subject extraction (i.e. out of a complement clause) so that I is in a position to c-command the subject trace in the spec,IP. Notice, however, that in subject relatives *that* has to be present obligatorily. According to the explanation we have provided for the *that-t* effect, the obligatory presence of *that* is interpreted as lack of I-to-C movement. In other words the only permissible head-chain is the expletive one: (*that*_i, I_i). Therefore the question that remains to be answered is why I cannot raise to C in subject relatives.

In order to provide an answer to this problem we will discuss briefly Chomsky's (1992) notion of *minimal domains*. Consider the structure in (27):

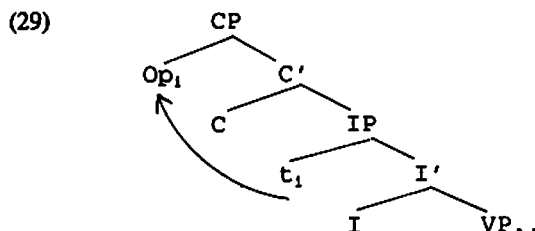


The minimal domain of the head X is {UP, ZP}, i.e. its spec and its complement. In other words the minimal domain of a head X is the set of nodes contained in its maximal projection "that are distinct from and do not contain X" (Chomsky 1992: 16). Accordingly the minimal domain of Y is {WP, XP}. Suppose now that X were to raise to Y. This would create an enlarged minimal domain not for X but for the chain (X+Y, *t*_X). The minimal domain of the chain now is {WP, UP, ZP}. As a

result of this movement WP, UP and ZP are in the same minimal domain and according to Chomsky they are equidistant (in the definition below Γ can be anything):

- (28) If α, β are in the same minimal domain, they are equidistant from Γ
(Chomsky 1992: 24)

Consider now the representation in (27) whereby we replace X with I, Z with C, and UP and WP with the subject trace and the null operator respectively, as in (29) below:



In (29) the subject has moved from the spec,IP to the spec,CP. Spec,IP is in the minimal domain of I. Spec,CP on the other hand is in the minimal domain of C. Suppose that I-to-C movement were to take place. That would create an enlarged minimal domain for the chain (I+C, t_1). Notice crucially that this enlarged minimal domain holds for the (I+C, t_1) link only. As a result the Operator and its trace would be in the same minimal domain, hence they would be equidistant with respect to anything else. But the problem that arises is that although the Op c-commands the original trace it is not understood to be in a "superior" position, or in other words to be ordered with respect to the trace, since they are both in the same minimal domain or in Chomsky's terms they are equidistant. In intuitive terms we understand this to mean that when the operator and the variable appear in the same minimal domain the Operator cannot be interpreted as superior to the variable (i.e. to take scope over the variable) and therefore the latter fails somehow to be identified. Thus it seems that a configuration of that type will have to be excluded. We could call this the *Ordering effect*.

Let us now try and formalise this concept. What we notice in the ill-formed configuration is that the notion of c-command is not itself sufficient to account for the ungrammaticality derived. Manzini (1993) embeds the notion of c-command in the definition of ordering/superiority in terms of minimal domains, as in (30) below:

- (30) (Y) is superior to (X) iff there is no node that dominates a member of (Y) and does not dominate (X).

(Y) and (X) denote the minimal domains of the heads Y and X respectively. What the definition in (30) translates to is that superiority/ordering holds of minimal domains, i.e. of sets of points in the tree, and not of single nodes. Consider now the schema in (29) whereby I is not under C. In this case there are two minimal domains: (C) and (I). According to (30) (C) is superior to (I). Suppose next that I-to-C movement takes place. As already mentioned that creates an enlarged minimal domain for the chain link (I+C). Notice crucially that *Ordering* is a relation that holds between two minimal domains (i.e. two sets of points). Thus in this case it fails to hold for (C) and (I) and the elements they contain, since we now have a single minimal domain, i.e. (I+C), instead of two. Hence the *Ordering effect* with respect to subject movement¹¹.

Let us now return to the issue of subject relatives. Since I-to-C raising is excluded for the reasons outlined above the formation of an addressed-based dependency will also be blocked. Consequently the subject will have to form an ordinary chain: (Op, t_i). The C and I heads on the other hand will be linked via an expletive chain. The implicit assumption is that only incorporation creates an enlarged minimal domain. Thus when the expletive chain is formed the Op and the trace remain in different domains, so the superiority/ordering relation is respected. Since the expletive chain is the only available option we expect that in English the complementiser *that* will always be present in subject relatives to ensure that I-to-C movement has not taken place. The same explanation extends to the Norwegian data (cf. (5) in section (1) repeated here for ease of reference) where the presence of the complementiser *som* is obligatory in subject relatives:

- (31) Vi kjenner den mannen *(som) snakker med Marit.
 "We know the man that is talking with Mary."

¹¹So far the *that-t* effect has been formulated in terms of c-command. In order to be consistent we could adopt the definition of Locality given in terms of superiority/ordering (cf. Manzini 1993):

(a) Let A_i be in (X_i). (A₁, ..., A_n) is a dependency only if for all i, (X_i) is superior to (X_{n+1}).

The crucial point is that the new definition does not affect the analysis we have provided so far with respect to the *that-t* effect.

According to the proposed analysis the presence of *som* reflects that I is not under C and for this reason the expletive form of C participates in the appropriate chain¹².

Note incidentally that under this account of the anti-*that*-t effect we do not have to assume that the complementiser *that* used in relatives is different from the one used in complement clauses. In other words we do not have to stipulate the presence of a [+pred] feature or to specify two different types of Agreement (agreement with an A- or an A'-position) as Rizzi (1990), (1991a) does. Thus we avoid all the problems associated with his analysis. Instead the anti-*that*-t effect is linked to the phenomenon of short movement. Further data from Scandinavian (Norwegian, Danish and Swedish) embedded interrogatives also point towards that direction. In Scandinavian the complementiser *som* is obligatory when the wh-phrase is related to the gap in the subject position (Taraldsen 1986a&b):

- (32) a. Vi vet [_{CP} hvem_i [_C som] [_{IP} t_i snakker med Marit]]
 We know-1pl who that talk-3s with Mary
- b. *Vi vet hvem snakker med Marit.
 We know-1pl who talk-3s with Mary
 "We know who is talking with Mary."

Once more in Scandinavian, we see that embedded interrogatives of the type in (32) pattern with subject relatives. This provides additional evidence for the assumption that the obligatory presence of *som* is associated with short movement. Furthermore, as a final point to this part of our discussion, we have to notice that the presence of *som* in embedded interrogatives as well implies that it is not specified for the [+pred] feature (cf. Rizzi 1990) since constructions of that type do not involve predication.

¹²There is a potential problem with the presence of *qui* in French subject relatives. If I-to-C movement does not take place the question is what *qui* reflects. There are two possibilities: we could either assume that it is the relative pronoun, or that it is the result of Agreement of C (*que*) with its spec that contains the empty operator (under spec-head agreement). Notice that under the latter explanation we would expect spec-head agreement of that type to arise in object relatives as well, contrary to fact. This issue is left open.

6.2 Some extensions and theoretical implications

We will next consider the implications this proposal has for the theory of movement in general. First of all if the anti-*that-t* effect is only an instance of the *Ordering effect* as the result of short subject movement, we predict that a similar situation, i.e. lack of I-to-C raising, will arise in other constructions as well where movement of that type is operative. In fact this seems to be correct, at least in English, with respect to subject extraction in matrix clauses:

- (32) a. Who left?
b. *Who did leave?

As (32a) shows I-to-C in the form of *do*-support is excluded. Notice that the structure is similar to relative clauses, the only difference being that in (32) there is an overt *wh*-operator while in subject relatives there is a null operator. Exactly as in relative clauses, in matrix clauses I-movement to C would create a configuration whereby the operator and the trace would be in the same minimal domain giving rise to an *Ordering effect*.

It is worth mentioning that there have been attempts (cf. Koopman 1983) to account for the lack of I-to-C movement in matrix clauses as in (32a) in terms of an ECP violation. The explanation provided essentially assimilates the construction in (32a) to the one that involves the *that-t* effect. Rizzi (1990, 1991b) also follows a similar line of reasoning. In particular, he argues that I under C is not a proper governor because it does not head-govern the subject trace within its immediate projection. In other words C is inert for government and movement of I to C cannot render it a proper governor (cf. Rizzi and Roberts 1989). However, C can become a proper governor if it takes its agreeing form as in the *that-t* context. According to Rizzi's (1991b) analysis the head I in matrix clauses is specified for the [+*wh*] feature. When the subject moves to the spec,CP it triggers agreement between C and I in terms of the [+*wh*] feature. Therefore C turns into a proper governor and the head-government clause of the ECP is satisfied. Note that the strategy followed is basically the one used in subject extraction out of a complement clause. As already mentioned the problem with this account is based crucially on the distinction between proper and non-proper head-governors. Moreover, it is not clear why I incorporated in C cannot head-govern the subject trace, if the important notion is essentially that of c-command after all, while C on the other hand can when it takes its agreeing form.

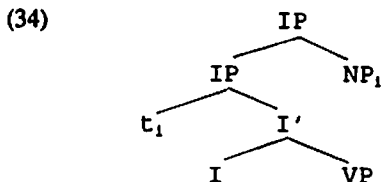
Note that under the analysis we have put forward the explanation provided for (32a) is actually the reverse of what Rizzi (op. cit.) proposed, since it treats (32a) in a way similar to the anti-*that*-effect in subject relatives: I-to-C movement

is excluded because it gives rise to an *Ordering effect*. The generalisation we derive stems from the fact that both constructions involve short subject movement. Furthermore, subject/object asymmetries of the type discussed so far receive a natural explanation as they are attributed to independent properties associated with locality phenomena.

This analysis accounts for a number of other constructions where short subject movement is at stake. Consider for example heavy NP-shift as in (33) below (from Rizzi 1990: 34)

- (33) a. *[t are intelligent] all the students who can solve this problem.
 b. I would like to introduce t to Mary all the students who can solve this problem.

Rizzi (1990) explains this subject/object asymmetry in (33a) and (33b) respectively in terms of a head-government violation: the subject trace in spec,IP fails to be head-governed because it is not in the immediate projection of I (a potential proper head-governor). Since the notion of head-government has been eliminated from our theory the ungrammaticality of (33a) is interpreted as an *Ordering effect* in our terms. In heavy NP-shift the subject moves from the spec,IP to an IP adjoined position, as shown in (34):

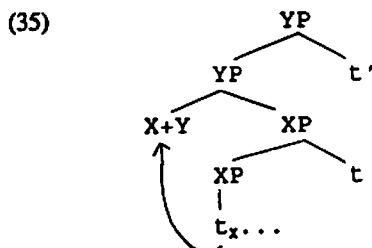


As is clearly indicated in (34) adjunction of that type creates a configuration where both the moved NP and its trace in spec,IP are in the same minimal domain (I), hence the ungrammaticality. The conclusion we draw is that movement cannot take place in the same minimal domain (cf. also Manzini (1993) for a similar proposal along these lines). Note that movement is restricted to the same minimal domain either when adjunction takes place, as in (34) above, or when incorporation is at stake as in the familiar example with regard to the anti-*that*-t effect. Therefore we expect that in all these constructions an *Ordering effect* will arise ruling them out as ungrammatical as is in fact the case.

At this point some clarifications need to be made in order for us to consider the theoretical implications of our analysis. According to what we have said so far we expect that the *Ordering effect* will arise only in cases of A'-movement from

an A position. As a consequence this speculation leaves out two cases: (i) adjunct movement and (ii) intermediate traces. Note that dependencies of the $(A', \dots, A)$ type are Operator-variable constructions. At LF variables are assigned values (i.e. they range over a set of entities) via their association with the Operator (the phrase in the A'-position). Adjunct (wh-)movement on the other hand is of the type $(A', \dots, A')$ whereby there is no variable involved. This observation leads us back to the well-known asymmetry between arguments and adjuncts. Recall, as we mentioned in section (3), that adjuncts do not bear a special relationship to a head while arguments do and this is formalised in terms of Case-marking (recall also that variables are Case-marked (cf. Chomsky 1981)). Therefore in $(A', \dots, A')$ dependencies the Operator and the original trace cannot be linked via an Extended CHAIN, but only through a chain of intermediate traces. Since incorporation (the mechanism that creates enlarged minimal domains for the sublinks of the Extended CHAIN) is not relevant for adjunct A'-dependencies we would expect that movement within the same minimal domain should be allowed. In other words the phrase in the Operator position and the original trace may occur in the same minimal domain without giving rise to ungrammaticality.

The same line of reasoning extends to intermediate traces as well. In order to make this point clearer let us consider the following (abstract) schema:



Suppose that in (35) the head X incorporates to Y forming the chain $(X+Y, t_x)$. Now t and t' are in the same minimal domain. We have to make sure that no *Ordering* effect arises in this case otherwise successive cyclic movement will have to be banned. But recall once more that intermediate traces differ from variables in a number of ways. For example, variables enter a relationship with a head while intermediate traces do not. Their role is to provide the links that will connect the original trace with the operator. In that respect they do not have properties of their own and consequently they are not assigned values of their own at the relevant level of interpretation. Instead they are identified by participating in the formation of (ordinary) chains. Thus they are immune to the *Ordering effect*. Notice incidentally that the issue of intermediate traces does not arise in argument

extraction if we assume that arguments can form address-based dependencies. In this case the intermediate links are provided by the heads that enter into the formation of an Extended CHAIN. Although the overall issue requires more research we can conclude for the time being that the *Ordering effect* holds only for (A',...,A) dependencies.

7 Conclusions

In the present paper I have argued that the presence of *that*-t and anti-*that*-t effects is linked to the phenomenon of I-to-C movement. In particular, I have suggested that the zero form of C reflects (abstract) I movement to C which is obligatory when the subject is extracted out of a complement clause so that I is in a position to c-command the subject trace. When *that* is overtly realised on the other hand then there is an expletive chain formed. This chain is obligatory in subject relatives to ensure that the Operator in the spec,CP and the trace in spec,IP are not in the same minimal domain, voiding therefore an *Ordering effect*. Under this proposal the anti-*that*-effect is linked to the phenomenon of subject short movement. The analysis put forward also accounts for other case of short movement such as subject extraction in matrix clauses and heavy NP-shift from a subject position. Finally, the generalisation we derived is that only dependencies of the (A',...,A) type are subject to the *Ordering effect* and not intermediate traces or (A',...,A') dependencies.

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