

THE MINIMAL LINK CONDITION AND THE
TYPOLOGY OF ISLAND VIOLATIONS

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ABSTRACT

An account of island-effects within the Minimalist Program presents a challenge, since, assuming the *Minimal Link Condition* (MLC) as the only locality constraint on movement as is done in the Minimalist Program (Chomsky 1995, chapter 4), fails to account for fundamental properties of movement, such as the asymmetries in *wh*-extraction from *wh*-islands which were traditionally explained by the ECP and the locality concept of Subjacency. Additionally, an explanation for the other types of island phenomena, the so-called CED-effects, is lost. Chomsky (1995) assumes that Infl, v° , and C° are the functional categories found in clausal structure and that the functional categories Infl and v may project multiple specifiers. I will argue that cross-linguistic variation with respect to *wh*-island phenomena can be explained if we assume that C° may project multiple specifiers as well. Furthermore, it will be shown that the nature of CED-islands can be derived from the structure-building operation *Merge*.

1. INTRODUCTION*

Assuming the Minimal Link Condition (MLC) as the only locality constraint on movement, as is done in the Minimalist Program (Chomsky 1995, chapter 4), provides several non-trivial problems for the theory of movement. For example, it fails to account for the well-known asymmetries in *wh*-extraction from *wh*-islands (1) which were traditionally explained with the ECP and the locality concept of Subjacency.

- (1) a. ?? [_{CP} *What* do you wonder [_{CP} how John could fix *t*]]
b. * [_{CP} *How* do you wonder [_{CP} what John could fix *t*]]
c. * [_{CP} *Who* do you wonder [_{CP} how *t* could fix the car]]

It also offers no explanation for the other types of island phenomena, the so-called CED (Condition on Extraction Domains) effects (2).

- (2) a. * *What* did Sam go out [_{PP} without [_{CP} **t'* PRO talking about *t*]]
b. * *What* did you hear [_{NP} a rumor [_{CP} **t'* that John had read *t*]]
c. * *What* did [_{CP} **t'* that you had paid *t*] surprise you

In this paper, I present an analysis of the typology of *wh*-island violations in different languages which shows that the Minimal Link Condition is in fact able to account for the

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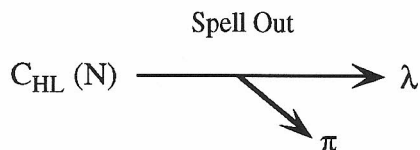
well-known asymmetries in *wh*-extraction across *wh*-islands if several additional assumptions with respect to the exact mechanism of feature checking in the C-system are made i.e., if it is assumed that C° may project multiple specifiers. Chomsky (1995, chapter 4) assumes that the option of projecting multiple specifiers is a property of functional categories I° and v° . The assumption that C° may project multiple specifiers as well will provide an explanation of *wh*-island phenomena. Finally, although the Minimal Link Condition does not offer an account for CED-effects, I will argue that these island phenomena can be shown to be deriveable from the way *Merge* operates i.e., concatenates categories.

The article is organized as follows. Section 2 provides a short introduction to the theoretical foundations and main ideas of the Minimalist Program as outlined in Chomsky (1995, chapter 4), with a discussion of how the Minimal Link Condition as a locality concept emerged from Relativized Minimality and Minimize Chain Links (MCL). In section 3, then I discuss why *wh*-island violations provide a problem for the Minimal Link Condition. Section 4 offers a solution for this problem in terms of multiple specifiers in the embedded C-system and shows that this analysis is able to account for the fact that languages differ with respect to the observed *wh*-island effects. Section 5 addresses the question of CED islands. The Minimalist Program does not offer any principal reason, why extraction out of CED-islands is impossible. In section 5, I will argue that CED-effects may be derived from the nature of *Merge*, the fundamental structure-building operation in the Minimalist Program. In section 6, I discuss further implications of my analysis of strong and weak islands. Section 7 provides the conclusion.

2. THE MINIMALIST PROGRAM AND THE MINIMAL LINK CONDITION

In the Minimalist Program a linguistic expression is taken to be a pair (π, λ) , π a PF representation and λ an LF representation. C_{HL} , the computational system of natural language, maps an array of lexical items (the *numeration*, see below) to the pair (π, λ) as shown in (3). Note that there is no D- or S-Structure representation in the Minimalist Program. PF and LF are the only interface levels (see Chomsky 1995, chapter 4):

(3)



The main syntactic operations that derive λ are the operations *Select*, *Merge* and *Attract/Move*.

The operation *Select* takes an item from the *numeration*¹ N , puts it into the derivation and thereby reduces its index by 1. If *Select* does not take all the elements from the *numeration*, there will be no derivation. *Merge* is a binary structure-building operation that applies cyclically building trees from bottom to top. *Merge* takes two

1 A numeration is a set of pairs (LI, i) where LI is an item of the lexicon and i is its index, understood to be the number of times that LI is selected. (Chomsky 1995: 225, 227). For example, given a numeration with the set of lexical items $(John_1, sleeps_1)$, in order to generate a derivation *John* and *sleeps* have to be selected from the numeration each one time.

selected syntactic objects and joins them together into a new syntactic object. Two *terms* (constituents) are combined, becoming a complex term (constituent), which has the properties of its head (cf. Chomsky 1994:12ff.). For example, the DP [*DP the book*] is a result of merger. It consists of the complex term $\{(D)the, \{(D)the, (N)book\}\}$ which results from merging the terms *the* and *book* where D (*the*) is the (projecting) head of the complex term DP. *Attract F/Move F* is the transformational operation which is responsible for the dislocation property of natural language i. e., it triggers what is traditionally called 'movement'. In addition, a process called Spell Out is assumed, stripping away the phonological properties/features of lexical items (or whatever is relevant for PF processes). Spell Out strips away from a derivation the features relevant for π . Spell Out is only an operation and not a syntactic level. It can apply at any time during the derivation. After Spell Out, the derivation goes on to construct λ .

A derivation *converges* at PF or LF (and fulfills the principle of *Full Interpretation*) if it consists only of legitimate PF- and/or LF-objects, otherwise the derivation *crashes*. *Convergence* is only a necessary condition for a linguistic expression to be "well-formed". It is possible that two or more different derivations that arise from one and the same numeration all converge. These derivations constitute a so called *reference set*. In this case, a comparison takes place, *economy principles* choose among the converging derivations in the *reference set* only the most economical as legitimate. For example, one economy principle, called *Procrastinate*, says that derivational operations are carried out as late as possible. Let us now have a look at the way transformational operations are implemented in the Minimalist Program.

Chomsky (1995:222) notes that movement i. e., the fact in natural language elements occur in positions different from the ones in which they are interpreted, is a fundamental property of natural language and should be understood as a *feature-driven* process. Assuming an operation *Move F(eature)* instead of *Move α* , as commonly assumed in earlier approaches within the framework of the Principles and Parameter Theory (see Chomsky 1981, 1982, 1986a, 1986b, 1991), it is suggested that transformations are driven by the need to check features. *Move F* raises features such as for example Case, Agreement or [+wh]. These features have to be moved into appropriate *checking* environments i.e., into a local domain, the so-called *Checking Domain*. The basic idea of feature checking is that a functional head has a certain feature α which has to be checked by movement of an analogous feature β by movement of β into the checking domain of α .

Movement operations *must* be driven by the need to check some features i.e., by the so-called *Last Resort Condition*. (Roughly speaking, the Last Resort Condition states that an operation involving an element α only applies if a property of α is satisfied by this operation.) Thus, LF movement is purely feature raising whereas overt movement raises categories i.e., the features that are also raised at LF together with its associated PF-features. Chomsky (1995) goes one step further and defines the transformational operation *Attract F* (dispensing with *Move F*). The definition is given in (4):

- (4) *Attract F* (Chomsky 1995: 297)
K attracts F if F is the closest feature that can enter into a checking relation with a sublabel of K.

(4) incorporates the principle of *Last Resort* and a locality constraint, called the *Minimal Link Condition* (MLC) which is defined as in (5):

- (5) a. *Minimal Link Condition (MLC)* (Chomsky 1995: 311)
K attracts α only if there is no β , β closer to K than α , such that K attracts β .
b. *Closeness* (Chomsky 1995:358)
 β is closer to the target K than α if β c-commands α .

The MLC is a variant of the economy principle *Minimize Chain Links* (MCL) (6):

- (6) *Minimize Chain Links* (MCL) (Chomsky and Lasnik 1993)
Make the shortest movement (i. e. do not skip potential landing sites)

The economy principle *Minimize Chain Links* (6) is a derivational version of *Relativized Minimality* (Rizzi 1990). MCL states that *Move* α should always construct chain links which are minimal in length — and forcing, for example, successive cyclic movement — whereas *Relativized Minimality*, is a condition on chains defined in terms of antecedent government. Hence, in contrast to (6) *Relativized Minimality* is a condition on representation. Roughly speaking, *Relativized Minimality* says that in a configuration [... X ... Y ... Z ...] X cannot antecedent govern Z if there is an intervening potential antecedent governor Y. In (5) we find the classical violations of *Relativized Minimality* (Rizzi 1990). Antecedent government of the trace t by its antecedent is blocked by an intervening element because the intervening element is of the same kind as the antecedent of the trace.

- (7) a. * *How* do you wonder what John could fix t ?
b. * *Be* John will t honest?
c. * *John* seems that it was told t [that Mary is pregnant]

In (7a), an intervening *wh*-phrase in the embedded Spec CP blocks antecedent government of the trace of *how*. In (7b), the intervening modal *will* blocks antecedent government of the verb trace of *be*, and in the super-raising example (7c), *it*, which intervenes between the long moved embedded object and its trace, also blocks antecedent government. *John* cannot antecedent govern its trace since there is an intervening element in an A-specifier position, which counts as a potential antecedent governor.

Now consider again (6). As noted in Chomsky and Lasnik (1993), an alternative explanation for the ungrammaticality of the examples (7a-c) can be given in terms of the economy principle MCL (6). MCL is violated in (7a-c) since the moved elements have all skipped a potential landing site. For example, the *wh*-element in (7a) moves across the embedded Spec CP position which is filled with *what*. The verb in (7b) and *John* in (7c) skip the nearest potential target, hence violating (6). As noted by Chomsky and Lasnik (1993), to interpret the mentioned locality condition as a condition on derivation (or on movement) rather than as a condition on representation has the advantage that we are able to derive the constraint from a general economy principle on derivation, the *Shortest Movement Condition*, which says "make the shortest movement".

Let us now return to (4) and (5). Note that (4) and (5a-b) have in common with (6) (irrelevantly, also with the former concept of *Relativized Minimality*) that the notion of "closeness" plays an essential role. (4) and (5a-b) state that a head K attracts the closest feature whereas (6) states that a category has to move to the closest potential landing site. On the other hand, an important difference between *Attract F* and also the MLC in (4)-(5) on the one hand and MCL (6) on the other hand is that (4) and (5) provide a definition which cannot be violated whereas (6) is an economy condition which can be violated i.e., if this happens movement leaves a *-marked trace (see Chomsky and Lasnik 1993 for discussion).

In order to see how this is meant, consider again (7b). In this example, C° has a strong feature, hence according to (4), C° attracts *will* which is the closest element that can enter into a checking relation with C° . According to (4), the example (7b) is never derived. Similarly, according to (4), (7a) and (7c) would never be generated. Consider (7c) if the derivation has reached the state of (8a).

- (8) a. [was told John [that Mary is pregnant]]
 b. It seems that *John* was told *t* [that Mary is pregnant]
 c. * *It* seems that *t* was told John [that Mary is pregnant]

Given the numeration for (7c), we have two possibilities to continue the derivation in (8a): we can either raise *John* to Spec IP or insert *it*. In the first case, we derive (8b), in the second (8c) but never (7c). If *Merge* applies and *it* is inserted, the matrix T head (which has a strong D-feature in English) attracts *it* and we derive (8c). According to (4), *John* cannot be attracted because *it* is closer to the matrix T° . Hence, the derivation in (8c) crashes - because *John* has not checked its case feature and the case checking feature of the matrix T° is not erased (see Chomsky 1995:348). In (8b), *it* is not inserted and *John* is moved to Spec IP, violating *Procrastinate*. Given that this derivation converges, a violation of the economy condition *Procrastinate* is allowed.

According to Chomsky (1995, 296f.), there is the following problem with the MLC as an economy condition. Recall that economy principles select among convergent derivations i.e., among derivations in which all features are checked, we choose the most economical. Then, the problem is that we cannot block the super-raising example (7c) because the derivation (7c) converges. Hence, Chomsky assumes that the MLC is part of the definition of *Move*. According to Chomsky (1995), (8c) does not converge for reasons having to do with Case-checking whereas all relevant features are checked in (7c). The goal is to block (7c) and rule in (8b). The first step is to assume that the MLC is part of the definition of *Move/Attract*. Given (4), only (8c) can be derived and never (7c). Now we have to exclude (8c). Note that raising of *John* in (8a) to yield (8b) violates *Procrastinate* in contrast to *Merge* of the expletive in (8c). Now recall that (8c) does not converge in contrast to (8b). To exclude (8c) and rule in (8b), Chomsky (1995:348) makes a special assumption on the interaction of *Merge* and *Attract/Move* at certain stages of the derivation: In (8a), *Move* is used (violating *Procrastinate*) instead of *Merge* because it leads to a convergent derivation.²

However, as noted by Chomsky (1995:297), this analysis leaves open why the violations associated with superraising examples are more severe than *wh*-island violations. In the following section, I will argue that this problem disappears if we assume the multiple specifier analysis for the C-system, since then the derivation of *wh*-

² Note that this example provides a good argument for incorporating the MLC/MCL condition into the definition of *Attract/Move*. In addition, according to Chomsky (1995) the economy principle MLC/MCL has the conceptual disadvantage that it is of "global" nature. A comparison of distinct derivations which is called for by MLC/MCL provides problems of computational complexity. Furthermore, a conceptual problem with the economy principle MLC/MCL arises if a comparison has to be made between derivations with shortest links in different positions. In contrast, it must be noted that several syntactic phenomena seem to provide evidence that the MLC/MCL should instead be interpreted as a separate condition (see Nakamura 1995 for discussion). Whatever conclusion is drawn, it does not affect my analysis of islands in this article. My solution for the account of *wh*- and CED-phenomena is independent of whether we interpret the MLC as a part of *Attract F/Move F* or not.

island violations proceeds in a completely different way from superraising examples in so far as only the former involves intermediate trace deletion.

3. PROBLEMS WITH THE MLC: *WH*-ISLANDS

Let us now turn to examples of *wh*-island violations such as (7a). Recall the paradigm of *wh*-island phenomena. Movement theory has always tried to account for the well-known extraction asymmetries in (9):

- (9) a. ?? *What* do you [_{VP} *t*' wonder [_{CP} how John could [_{VP} *t*' [_{VP} fix *t*]]]]
 b. * *How* do you [_{VP} *t*' wonder [_{CP} what John could [_{VP} *t*' [_{VP} fix *t*]]]]
 c. * *Who* do you [_{VP} *t*' wonder [_{CP} how [_{IP} *t* could fix the car]]]

Only complements may be extracted out of *wh*-islands (9a), yielding a (mild) subjacency violation. Adjunct- and subject-extraction violates the ECP (9b-c). The account for the contrasts in (9) relies on the intermediate adjunction hypothesis in conjunction with the (independently supported) assumption that intermediate traces of arguments located in A'-positions are not licensed at LF and therefore must be deleted, whereas intermediate traces of adjuncts cannot be deleted (Lasnik and Saito 1984; 1992, Chomsky 1986a, Chomsky and Lasnik 1993).

Chomsky and Lasnik (1993) rely on the *Uniformity Condition* on chains to derive this effect (cf. also Chomsky 1991). They argue that i) only uniform chains - including, as a special case, the two-membered operator-variable chains - are legitimate objects at the LF-interface, and that ii) trace-deletion is a Last Resort operation that creates uniform chains. Uniformity is a relational notion. A chain is uniform if all its members share the relevant property (UN[P]), for example L-relatedness (UN[L]) (see also (17a) below). Adjuncts and heads are non-L-related elements. They only move to non-L-related positions, creating legitimate objects i.e., uniform chains where every member occupies a non-L-related position. A-chains with each element in an A- or L-related position are also uniform. Hence, deletion of traces does not apply in these uniform chains. In the case of long *wh*-movement of arguments it is important that only operator-variable chains count as uniform, therefore intermediate traces are deleted from A'- or Non-L-related positions as a Last Resort operation, yielding legitimate LF-objects of the form (*Wh*, *t*), where *t* represents the Case-marked position, i. e. the variable.

The account for the *wh*-island violations given in Chomsky and Lasnik (1993) relies on the economy principle *Minimize Chain Links* (6). The data in (9) are then accounted for because movement of the *wh*-phrase does not proceed in a successive cyclic way via Spec CP. The long-extracted *wh*-phrases fail to make the "shortest move" because they all skip Spec CP, which is a potential landing site. Hence, this movement violates the condition *Minimize Chain Links*. Under these assumptions, the trace in Spec IP in (9c) is *-marked because the *wh*-phrase fails to make the shortest move (IP-adjunction is excluded by assumption). This trace remains at LF because it represents the variable. In (9b) a uniform chain is created with one *-marked trace, the trace in VP-adjoined position. Deletion of the *-marked trace may not apply. In (9a), on the other hand, a trace in a VP-adjoined position ensures that the variable is not *-marked. This trace itself is *-marked but deleted at LF. Intermediate adjunction to VP is necessary to account for the data in (9). Furthermore, given that MCL forces chain links to be minimal in length, VP-adjunction is obligatory under the assumption that VP represents a possible landing site.

Given the analysis in Chomsky (1995, chapter 4), this analysis can no longer be maintained. First, according to Chomsky (1995) all movement is triggered by feature-checking. Given that a position adjoined to XP is no longer a checking position, *intermediate adjunction is impossible*.³ If intermediate adjunction to VP in the sentences of (9) is impossible, complement extraction across a *wh*-island should be as ungrammatical as adjunct- and subject-extraction. If, as assumed in Chomsky and Lasnik (1993), movement that violates MCL leaves a *-marked trace and there is no intermediate trace in the embedded sentences, then we get a derivation like (10).

- (10) a. ?? *What* do you wonder [CP how John could [VP fix *t*(*)]]
 b. * *How* do you wonder [CP what John could [VP fix *t*(*)]]
 c. * *Who* do you wonder [CP how [IP *t*(*) could fix the car]]

Complement extraction (10a) should be as ungrammatical as adjunct- and subject-extraction (10b-c), because the initial traces in these examples are always *-marked. Hence, if there is no intermediate trace in adjoined position in the embedded sentence (10), why is there a difference in deviance between complement extraction, on the one hand, and adjunct and subject extraction, on the other?

The first question is therefore how we can provide an explanation for the asymmetries found in these examples without relying on the concept of intermediate adjunction. In the next section I will argue that an account can be given if we assume that Spec CP may contain multiple Specifiers.

Secondly, the fact that the MLC is part of the definition of *Attract* provides a further problem. Recall that Chomsky (1995) assumes that there is a distinction between [\pm interpretable] features. The [+*wh*] features on *wh*-phrases are [+interpretable]. Importantly, these features on XPs remain accessible for the computational system after checking, ensuring that one and the same element may undergo successive-cyclic movement or attraction.⁴ It follows that *wh*-island violations never arise. An embedded [+*wh*]-C^o as in (11a) always attracts the closest *wh*-phrase according to the MLC. This *wh*-phrase moves to Spec CP and is then attracted again by the [+*wh*] matrix C^o, as in (11b), because when located in the embedded Spec CP, it is closer to the matrix C^o than the *wh*-phrase in situ:

- (11) a. [CP *Who*₁ [IP *t*₁ could solve what]]
 b. [CP *Who*₁ do you wonder [CP *t*₁' [IP *t*₁ could solve what]]]

³ Furthermore, many empirical arguments against intermediate adjunction can be found in Grewendorf and Sabel (1994, 1996), Sabel (1995a, 1995b, 1996b).

⁴ The corresponding Q-feature in the head of the attracter is also [+interpretable] and strong in English, triggering overt movement. Furthermore, weak [+interpretable] features need not be checked. Therefore *wh*-phrases in situ (for example in multiple *wh*-question in English) or their *wh*-features are not moved at LF. The properties of [+interpretable] features correlate with the assumption that [+interpretable] features are legitimate LF Objects that enter into interpretation. In contrast, [-interpretable] features (such as Case) need to be checked in any event, and hence are eliminated at LF. [-Interpretable] features on XPs immediately disappear after checking. This prohibits, for example, an NP from checking one and the same feature more than one time.

The [+wh] feature of the embedded C° is checked in (11a). Therefore, it cannot attract *what* at a later step of the derivation (11b). Furthermore, such a movement would be counter-cyclic. Given the definition in (4), *wh*-island violations as in (10) cannot be derived. Chomsky notes that the example (11b) converges with all relevant features checked, yielding gibberish since the structure cannot be interpreted adequately.⁵

In the following we will see that an analysis assuming multiple specifiers will provide a solution for this problem and for the other cases of *wh*-island violations, which were used as arguments for the intermediate adjunction hypothesis, such as the examples involving reconstruction for the purposes of the binding theory.

4. A SOLUTION IN TERMS OF MULTIPLE SPECIFIERS

Cross-linguistic variation of *wh*-island effects suggests that what seems to be a complement/non-complement asymmetry in (9) is in fact a Θ /non- Θ asymmetry. The accusative object in English, which does not overtly move out of VP for case-checking is extracted from its Θ -position in (9a) whereas subject and adjunct extraction takes place from non- Θ -positions. Hence, extraction out of *wh*-islands is only possible if it takes place from a Θ -position (Koopman and Sportiche 1985, 1986, Browning 1987, Huang 1993).

The relevancy of this generalization is supported by the extraction facts in languages like French (Comorovski 1990), Dutch (van Koot 1988) or German (Fanselow 1987, Bayer 1991), in which subject *and* object NPs move out of VP for case checking.⁶

⁵ Note that Chomsky (1995, chapter 4) allows for feature-checking via *Merge* in Non- Θ -positions. This is relevant for cleftive constructions and for the analogue of (8) with *whether*:

(i) * *What* do you wonder whether John could fix *t* ?

Like *who* in (11) *whether* in (i) checks the [+wh]-feature of the embedded C°. At a later step of the derivation *whether* is attracted by the matrix C-head (ii). Again, the derivation in (i) is not possible.

(ii) * *Whether* you wonder *t*_{whether} John could fix *what*

However, a trace inside the embedded Spec CP position is not licensed (see footnote 10 for discussion).

⁶ Recall some of the arguments which were proposed in the literature in favor of movement of the object to Spec AgroP or Spec₂ VP (object shift) in these languages. One argument concerns participle agreement facts in French discussed in Kayne 1989 and Chomsky 1991, 1993, among others. These authors assume that in examples like *les chaises [CP que [IP Paul a t' repeintes t]]*, 'the chairs which Paul has painted', the *wh*-phrase moves to AgroP leaving an intermediate trace *t'* that triggers participle agreement. In addition, certain properties of parasitic gap constructions seem to provide evidence for object shift in German if one assumes that scrambling in German and Dutch licenses parasitic gaps (Felix 1983, Bennis and Hoekstra 1984). Given that parasitic gaps are licensed only by (overt) A'-movement, examples of the type presented in (i) led Wyngaerd (1989), Mahajan (1990) among others to the conclusion that the scrambled NP in (i) is moved via an AgroP specifier position in order to check its case. In this position the NP is able to bind the reciprocal, and in addition, it is possible for the scrambled element to license the parasitic gap from its final landing site i.e., the IP-adjoined position which is classified as an A'-position (see also Müller 1995, Grewendorf und Sabel 1996).

(i) ? *weil die Gäste* der Student [ohne *e* anzuschauen] [AgroP *t'* [VP einander *t* vorgestellt hat]]

since the guests_{acc} the student_{nom} without to-look-at each-other_{dat} introduced has

'The student has introduced the guests to each other without looking at them.'

In these languages objects (12a), (13a) like subjects (12c), (13c) and adjuncts (12b), (13b) may not be extracted out of *wh*-islands:

- (12) a. * [CP Was₂ fragt sich Hans [CP wie₁ [IP Fritz t₂ t₁ repariert hat]]]?
 what_{acc} asks refl. Hans_{nom} how Fritz_{nom} fixed has
 'What did Hans wonder how Fritz has fixed?'
- b. * [CP Wie₂ fragt sich Hans [CP was₁ [IP Fritz t₁ t₂ repariert hat]]]?
 how asks refl. Hans_{nom} what_{acc} Fritz_{nom} fixed has
 'How did Hans wonder what Fritz has fixed?'
- c. * [CP Wer₂ fragt sich Hans [CP wie₁ [IP t₂ das Auto t₁ repariert hat]]]?
 who_{nom} asks refl. Hans_{nom} how the car_{acc} fixed has
 'Who did Hans wonder how has fixed the car?'
- (13) a. * Ik weet niet [*wie* hij zich afvroeg [of jij *t* aardig vond]]
 I know not who he wondered whether you liked
 'Who did he wonder whether you liked t'
- b. * Ik weet niet [*waarom* hij zich afvroeg [of Jan *t* ontslagen was]]
 I know not why he wondered whether Jan fired was
 'Why did he wonder whether Jan had been fired'
- c. * Ik weet niet [*wie* hij zich afvroeg [of *t* jou aardig vond]]
 I know not who he wondered whether you liked
 'Who did he wonder whether t liked you'

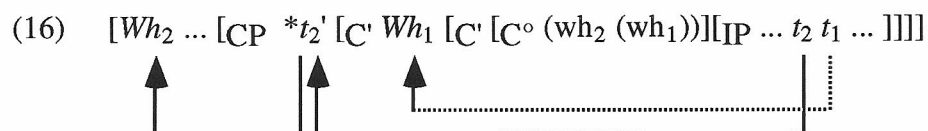
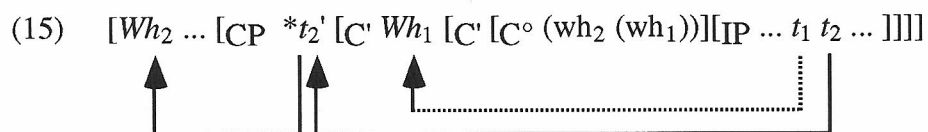
The observation that extraction out of *wh*-islands is only possible from Θ -positions extends to the analysis of similar examples in *pro*-drop languages. As argued in Rizzi (1986), the subject position in languages such as Spanish and Italian may be occupied with an expletive *pro* and the inverted subject in Θ -position may be case-marked in a way other than via specifier head agreement with Infl, granted that the inverted subject position behaves like a case-marked A-position. Chomsky (1995, section 4.5), who assumes that covert movement is in fact feature-movement, reaches a similar conclusion. If we accept that the base position of the inverted subject is a Θ -position, then in Spanish (and Italian —see Rizzi 1982:51 for the corresponding examples in Italian), nothing blocks movement of the subject (14c), in contrast to English (9c), German (12c), or Dutch (13c):

Jaeggli (1988)

- (14) a. * *Qué* no sabes quién compró
 what not know-you who bought
 'What don't you know who bought?'
- b. * *Por qué* no sabes qué comprar *t*
 why not know-you what to-buy
 'Why don't you know what to-buy?'
- c. ? *Quién* no sabes qué compró
 who not know-you what bought
 'Who don't you know what bought?'

Let us turn to the question of how the derivation of *wh*-island violations proceeds, in light of the prohibition of intermediate adjunction and the definition of *Attract*. I assume that the embedded C-System in these cases may contain multiple landing positions for *wh*-phrases (see also Reinhart 1981; Comorovski 1986, 1989) i.e., multiple specifiers.

I will follow an idea of Koizumi (1994) who assumes a multiple specifier analysis for topicalization in English, embedded verb second in Yiddish and the Scandinavian languages, and multiple *wh*-fronting in the Slavic languages. Koizumi (1994) presents evidence that the head of a phrase with multiple specifiers contains hierarchically ordered features which have to be checked in a certain order.⁷ Adopting the main idea of Koizumi's analysis, I will assume that the selected C-head in indirect questions may bear more than one [+*wh*]-feature. The *wh*-features in this head are hierarchically ordered [*wh*₁] > [*wh*₂] and thus have to be checked in different specifier positions of CP by different *wh*-phrases.⁸ If this is true, the embedded Spec CP positions in the examples above have the following structure, with *t*₂ either as an A'-position (in the case of long adjunct extraction) or a base/derived A-position (in the case of long argument extraction):



Both *wh*-phrases move to the intermediate specifier positions. The intermediate trace *t*₂' is located in Spec₂, whereas *Wh*₁ has moved to Spec₁. In (15) and (16) different *wh*-phrases occupy the specifier positions, because they differ with respect to the *wh*-feature they bear. In both cases *Wh*₂ is closer to the attracting matrix C°-head. The idea that the *wh*-phrases bear different *wh*-features allows us to motivate movement of both *wh*-phrases without violating the condition *Attract*.⁹ Importantly, the embedded C°-head bears [+*wh*] features that require a *wh*-operator in both Spec positions. Note that the intermediate trace

7 The idea of hierarchically ordered features can possibly be derived from the assumption that lexical elements are taken to be sequences of features, as suggested in Chomsky (1995:195). Chomsky mentions a restriction for feature-checking, which relies on the idea that elements contain hierarchically ordered features. One consequence of this restriction is that the effects of the head movement constraint can be derived. The idea is that features in a checkee i.e., in a verbal head, have to be checked in a certain order. Assuming that lexical elements are taken to be sequences of features and checked in a certain order, Chomsky (1995) suggests that, it is possible to capture the effects of Baker's Mirror Principle in minimalist terms (see also Grimshaw 1991 and Cherny 1992 for a similar suggestion).

8 Koizumi assumes that hierarchically ordered Top- and Neg-features ([Top] > [Neg]) in one and the same functional head triggers checking of two different elements (TopP and NegP) in different specifier positions of one and the same projection.

9 This also rules out the possibility that *Wh*₁ moves from Spec₁ to Spec₂. See also Reinhart (1981) for suggestions on how to regulate the filling of multiple landing positions in Spec CP. Interestingly, the prohibition against movement from Spec₁ to Spec₂ is required for independent reasons, since it is, a prerequisite of Chomsky's (1995) multiple specifier analysis of transitive expletive constructions in Icelandic that the expletive element merged in Spec₁ of IP is prohibited to move to Spec₂ (see Mulders 1997).

of the *wh*-phrase wh_2 is not an operator. Hence, this trace is *-marked, after the matrix C-head attracts Wh_2 .¹⁰

Let us now adopt a proposal made in Chomsky (1995:388, Fn. 75), according to which, besides L-relatedness, — Θ -positions are relevant for the *Uniformity Condition on Chains* (17a). Recall that operator-variable chains are the only chains in which intermediate trace deletion takes place. No intermediate trace deletion applies in uniform chains. If we take L-relatedness *and* Θ -positions to be the relevant property P, then we can reformulate the condition for intermediate trace deletion. Let us assume that intermediate trace deletion may only apply if a chain fulfills both conditions in (17b):

(17) *Uniformity Condition*

- a. A chain C is uniform with respect to P (UN[P]) if each α_i has property P or each α_i has property non-P.
- b.

i.	A'	...	(A')	...	A	(operator-variable chain)
ii.	Θ'	...	(Θ')	...	Θ	

Now we are able to explain the examples (9)-(10) and (12)-(14). Let us assume that these examples are derived as shown in (15)-(16). In (9b-c) the intermediate trace $*t_2'$ (with respect to (15)-(16)) may not be deleted since the chain ($Wh_2, *t_2', t_2$) is uniform i.e., each member of the chain is located in a non- Θ -position. The initial trace in (9b) marks the base-position of the adjunct whereas t_2 (with respect to (15)) in (9c) is located in Spec IP. Therefore, the intermediate traces may not be deleted. In contrast, the chain ($Wh_2, *t_2', t_2$) in (9a) is not uniform because t_2 is located in a Θ -position. In this example the intermediate trace must be deleted, and at LF we get the chain (Wh_2, t_2). The slightly deviant character of this sentence may be due to the fact that a *-marked trace was created during the derivation. The explanation for (9b-c) extends to (12b-c), (13b-c). In contrast to (9a), object extraction out of a *wh*-island is ungrammatical in German, Dutch (and French) since t_2 is located in a non- Θ -position i.e., the position in which structural case is assigned to the extracted object. Hence the relevant chains in (12)-(13) are all uniform, and consequently the intermediate *-marked trace cannot be deleted. The explanation for the Spanish (and corresponding Italian) cases (14a-b) is the same as for German and Dutch. In contrast to these languages, subjects may be extracted out of *wh*-islands, as in (14c), since extraction takes place from a (case-marked) Θ -position. Again deletion of the intermediate trace $*t_2'$ is forced to create a uniform chain.

¹⁰ It is commonly assumed that intermediate traces are [-*wh*]-elements i.e., non-operators. This assumption automatically excludes examples such as **Who do you wonder [t' [t won the race]]* in which the [+*wh*]-C° of the embedded CP needs a [+*wh*]-element in its specifier. However, given that intermediate traces are [-*wh*]-elements, *t'* is *-marked and the ungrammaticality of this sentence is expected. If one assumes LF *wh*-movement, an additional empirical argument for the assumption that traces are [-*wh*]-elements can be gained from sentences such as *Who knows [who [John saw t]]*. As can be seen from this example the embedded [+*wh*]-C° is checked by a *wh*-element. However, this example cannot be understood as a matrix double question which means that this *wh*-element cannot be interpreted in the matrix Spec CP position. Again, this results in a mismatch since the fact that a [-*wh*]-element occupies an embedded Spec CP with a [+*wh*]-C° head (for further discussion see Lasnik and Saito 1992, Rizzi 1996). This requirement is seen at best as an interface condition at LF which presupposes that the intermediate trace is somehow present. See also Manzini (1998) where it is argued that the ungrammaticality of *wh*-island violations results from the fact a variable is bound by two operators in violation of the bijection principle, hence *wh*-island violations are due to the violation of a semantic requirement.

Note that this analysis makes the strong prediction that in languages with object shift, *wh*-questioning of objects across *wh*-islands should be impossible. In fact, languages with obligatory object movement into a Case-position such as Icelandic do not allow for object extraction out of *wh*-islands (Maling 1979):

- (18) * *Hvað vissi enginn hver hefur skrifað t?*
'What does no one know who wrote?'

Furthermore, this analysis correctly predicts that argument PPs should be easily extractable across *wh*-islands in all languages. This is not only true for English (Chomsky 1986a:39), Comorovski (1990) further shows that this holds for French, Italian and Spanish, and, as can be seen from the following examples it also holds for Dutch (19a) and German (19b) (Koster 1987).¹¹

- (19) a. *Ik weet niet met wie hij zich afvroeg of hij t zou kunnen praten?*
I know not with who he wondered whether he would be-able to-talk
'I don't know with whom he wonders whether he would be able to talk'
b. *Mit welchem Mann weißt du nicht was er t besprechen will?*
with which man know you not what he discuss wants

Hence, the multiple Spec analysis provides a straightforward account for the observed cross-linguistic variation with respect to extraction from *wh*-islands i.e., one that is compatible with the notion of *Attract* and the impossibility of intermediate adjunction.¹²

¹¹ However, the issue is more complicated in that some PPs are more easily extractable than others (see also Postal 1994).

¹² It should be added that this analysis is fully compatible with an analysis of multiple *wh*-fronting languages such as Bulgarian and Romanian. As is well-known these languages allow for long distance fronting of multiple *wh*-elements as in (i) from Romanian (Comorovski 1986):

- (i) *Cine_i cui_j ce_k ziceai ca t_i i-a promis t_k t_j*
who to-whom what you-were-saying that to-him has-promised
'Who did you say promised what to whom?'

These constructions seems to pose a problem for the assumption that movement may not proceed via intermediate adjunction for the following reason. As noted in Rudin (1988), to derive a sentence like (i) without violation of subadjacency it is necessary for more than one *wh*-phrase to pass through the embedded Spec CP position, which means that Bulgarian and Romanian must allow multiple (intermediate) *wh*-traces to be adjoined to Spec CP as in (ii) (Rudin 1988: 455):

- (ii) [_{CP} *Wh_i Wh_j . . .* [_{CP} [_{SpecCP} *t'_i [t'_j]*] . . . *t_i . . . t_j . . .*]]

The derivation in (ii) clearly rests on the possibility of intermediate adjunction. However, as argued in Kraskow (1990), Grewendorf and Sabel (1996, 1998), and Ackema and Neeleman (1988) there is empirical as well as conceptual evidence against the intermediate adjunction analysis (i). The mentioned authors alternatively suggest that the multiple *wh*-elements in Bulgarian and Romanian may in fact move as *one single constituent* successive cyclically from Spec CP to Spec CP (leaving only one intermediate trace in the embedded Spec CP position) which is clearly expected if intermediate adjunction is impossible. This analysis can be motivated along the following lines. For example, in Grewendorf and Sabel (1996) it is argued that due to a parameterized property of DPs, *wh*-elements in multiple *wh*-questions in Bulgarian and Romanian attract *wh*-phrases (this is called the *wh-cluster hypothesis* "A *wh*-element acts as a checker for other *wh*-elements (*wh*-arguments as well as *wh*-adjuncts). The so-built *wh-cluster* is then itself attracted by C°. A similar analysis is then suggested for

Independent empirical evidence for movement through Spec CP (and against intermediate adjunction) can be provided from reconstruction data. Consider the examples (20)-(21):

- (20) a. * John_i thinks [that [Mary bought some pictures of himself_i]]
 b. John_i wonders [*which pictures of himself_i* [Mary bought *t*]]
 c. *Which pictures of himself_i* does John_i think [*t*' that [Mary bought *t*]]
- (21) a. * John told Mary_i [that [Paul bought some pictures of herself_i]]
 b. John asked Mary_i [*which pictures of herself_i* [Paul bought *t*]]
 c. *Which pictures of herself_i* did John tell Mary_i [*t*' that [Paul bought *t*]]

In (20c) and (21c) the anaphor contained in the *wh*-phrase is not c-commanded by the matrix subject. Nevertheless it can take *John* and *Mary* as antecedent. As can be seen from (20a) and (21a), in its base-position the anaphor is not licitly bound by its antecedent. However, in the embedded Spec CP the anaphor is accessible to binding from the matrix clause, as can be seen from (20b) and (21b). (20c) and (21c) provide evidence for the fact that at one step of the derivation the *wh*-phrase occupies the intermediate Spec CP position.

If we assume that Condition A can be satisfied anywhere in the derivation (cf. Belletti and Rizzi 1988, Uriagereka 1988, Lebeaux 1991, Sabel 1996b), then the anaphor satisfies condition A at one step of the derivation when the *wh*-phrase is located in the intermediate Spec CP position. Given this analysis, the examples in (22) and (23) provide evidence for the multiple Spec analysis.

- (22) a. * John_i wonders [where [Mary bought some pictures of himself_i]]
 b. John_i wonders [*which pictures of himself_i* [Mary bought *t*]]
 c. ?? *Which pictures of himself_i* does John_i wonder [*t*' where [Mary bought *t*]]
- (23) a. * John asked Mary_i [where [Paul bought some pictures of herself_i]]
 b. John asked Mary_i [*which pictures of herself_i* [Paul bought *t*]]
 c. ?? *Which pictures of herself_i* did John ask Mary_i [*t*' where [Paul bought *t*]]

The examples in (22c) and (23c) are much better than (22a) and (23a) indicating that the anaphor meets condition A in the (c)-examples in contrast to the (a)-examples. Given that the anaphor is not bound in its underlying position (22a), (23a) nor in its surface position, and given that the intermediate Spec CP is filled with a *wh*-phrase in (22c) and (23c) the question is how the anaphor fulfills principle A. The multiple Spec analysis provides an answer to this question. The long-moved *wh*-phrases in (22c) and (23c) are extracted via Spec₂ of the embedded CP, and in this position the containing anaphor may be bound by the matrix subject in (22c) and by the matrix object in (23c). The marginality of (22c)

“covert” *wh*-cluster formation in multiple *wh*-constructions in Japanese following suggestions already made by Saito (1994) and Abe (1993a, 1993b).

As already mentioned in the text, an alternative analysis of long extraction in Bulgarian and Romanian in terms of multiple specifiers is suggested in Comorvski (1989:133), Koizumi (1994), and Richards (1997). However, this analysis is not compatible with the analysis of *wh*-island violations presented in this paper where it is assumed that all languages may project multiple CP specifier positions.

and (23c) is due to the violation of the *wh*-island constraint i.e., due to the creation of *-marked trace at one step of the derivation.

A further argument in favor of the analysis of *wh*-islands presented in this section comes from the fact that it offers a different account for *wh*-island violations and superraising examples. I have already pointed out the problem, noted in Chomsky (1995:297) that superraising examples are more severe than *wh*-island violations with long extraction of *wh*-arguments. In the analysis presented here, this follows from the fact that the deletion of a *-marked intermediate trace applies only in the case of *wh*-island violations (with argument extraction).

Summarizing this section, we can conclude that extraction out of *wh*-islands can be explained in terms of the multiple-specifier analysis, which relies on the idea that long *wh*-movement across *wh*-islands does in fact proceed via a second CP specifier position.¹³

5. CED VIOLATIONS AND MERGE

In the preceding section I have argued that, given the multiple specifier analysis, variations of language particular *wh*-island violations are a consequence of the *Uniformity Condition on Chains* in a way similar to suggestions in Chomsky and Lasnik (1993). The question now arises of how we can account for other types of island violations. In the Minimalist Program as outlined in Chomsky (1995, chapter 4) nothing blocks attraction of elements inside CED-islands (Condition on Extraction Domains) from external positions, leaving the ungrammaticality of examples such as (25) unexplained. In contrast to this, previously, Chomsky (1986a) attempted to give a unified account of the island behavior of *wh*-islands and violations of Huang's *Condition on Extraction Domains* (CED). This account is no longer available; one reason for this is simply that it relies on the notion of government (and the Minimalist Program no longer

¹³ A question arises with respect to the analysis of *wh*-island violations outlined above. It concerns the analysis of so-called "surprising asymmetries" (see Rizzi 1990a:81f., 95f.):

- (i) a. ?? *Who* do you wonder [whether [we believe [*t'* [we can help *t*]]]]
- b. * *How* do you wonder [whether [we believe [*t'* [we can help Bill *t*]]]]
- c. ?* *Who* do you wonder [whether [we believe [*t'* [*t* can help us]]]]

As can be seen from these examples, a subject-adjunct asymmetry (ib) vs. (ic) appears if one more level of embedding is added (compare with (10b) vs. (10c)). I follow Pesetsky (1984) and Rizzi (1990) (among others) in assuming that the ECP (or whatever substitutes it) is not responsible for these contrasts and that an independent explanation has to be found for these cases.

Note furthermore that it is still necessary to invoke some version of the Superiority Condition for an exhaustive explanation of *wh*-island effects, as can be seen from (iia-b).

- (ii) a. * *To whom*₂ do you wonder [*what*₁ it seemed *t*₂ [that Mary bought *t*₁]]]
- b. ?? *What*₂ do you wonder [*to whom*₁ it seemed *t*₁ [that Mary bought *t*₂]]]

Furthermore, the anti-adjacency effect in (iii) is not explained by the proposed account:

- (iii) ? *Who* do you wonder [whether *(under normal circumstances) *t* would marry Sue]

However, the fact that a similar contrast is also observed with *that*-*t* effects (Bresnan 1977, Fukui 1993, Culicover 1993, Rizzi 1995, Browning 1996) (iv) suggests that for some reason C° may not occur adjacent to the verb (Hoeksema 1985).

- (iv) ? *Which doctor* did you tell me [that *(during the operation) *t* had had a heart attack]

Although my analysis does not offer a principled account for (i)-(iv), it is not necessarily inconsistent with an alternative explanation.

recognizes government as a legitimate syntactic relation) and the concept of intermediate adjunction (which is no longer available). Chomsky and Lasnik (1993) (see also Cinque 1990) adopted a formulation of the CED according to which "every non-complement is a barrier" (24). The CED rules out the classical cases of extraction out of adjuncts (25a), subjects (25c), and violations of the CNP constraint (25b). As can be seen from (25), I assume that extraction out of islands leaves a *-marked trace.

- (24) *Barrier* (Chomsky and Lasnik 1993)
Every non-complement is a barrier.
- (25) a. * *What* did Sam go out [PP without [CP **t'* PRO talking about *t*]]
b. * *What* did you hear [NP a rumor [CP **t'* that John had read *t*]]
c. * *What* did [CP **t'* that you had paid *t*] surprise you

However, the *Uniformity Condition* forces the intermediate traces to be deleted in (25), leaving chains that are legitimate objects of the form (*Wh, t*). The existence of this option is problematic because such well-formed chains do not reflect the strong ungrammaticality of the examples (25) in relation to object extraction out of *wh*-islands (see (10a)). In this section, I will argue that the intermediate traces in (25) are invisible for *Delete α* and that they therefore violate the *Uniformity Condition*.¹⁴ Let us first reconsider the notion of barrier.

We can take CED effects to be a result of the way *Merge* concatenates categories. Recall that *Merge* operates bottom to top, that is cyclically. The head-complement relation is derived by pairing a head with another category. *Merge* establishes a syntactic relation between head and complement by pairing the two categories. Note that a specifier is still absent when we merge head and complement, because *Merge* operates cyclically. In this respect, the following asymmetry is important. Categories that are merged with heads (complements) are not barriers for extraction, whereas categories that are merged with non-heads (non-complements) are barriers for extraction. Complements are merged with a head. This is different for both subjects (specifiers) and adjuncts which are merged with complex categories. In contrast to complements, the latter categories are islands for extraction. The following definition of a barrier is based on this intuitive idea. In (26), I distinguish between T_1 and T_2 . T_1 and T_2 are constituents and T_1 contains T_2 :

- (26) *Barrier*
A category A may not be extracted from a subtree T_2 (X^{\max}) of T_1 if T_2 was merged at some stage of the derivation with a complex category (i. e. with a non-head).

¹⁴ Given that *wh*-movement seems to be successive cyclic each application in (21) must be conceived of as a feature-driven movement to every intermediate CP, even if [+*wh*] features are not ultimately checked there (cf. Chomsky 1995; Collins 1993, 1994; Ferguson and Groat 1994, Sabel 1998). As pointed out by Ferguson and Groat (1994), Collins (1997) and Sabel (1998), there is in fact morphological evidence from Dutch and German as well as from other languages that intermediate Comps bear *operator*-features of some sort, even if they are not the site of the *wh*-operator at LF. Hence, I assume in the following that successive cyclic *wh*-movement in examples such as (25) is determined by some sort of *operator*- or *focus*-features that are associated with relevant intermediate C° -heads. For the hypothesis that *wh*-movement proceeds in a successive cyclic manner see also Kayne and Pollock (1978), Reinhart (1981), Browning (1987:309ff.), Collins (1993), Ferguson and Groat (1994), Thornton and Crain (1994) among others.

Note that VP and IP are never barriers with respect to clause-internal extraction according to (26). For example, VP is not a barrier for *t* in (27) since VP is merged with I° and VP. Furthermore, IP is not a barrier for *t* because IP is merged with C°.

(27) *What* do [_{IP} you [_{VP} like *t*]]

The formulation (26) explains the traditional CED effects in (25) and (28):

- (28) a. * *How* did you [_{VP} [_{VP} leave] [_{PP} before [_{CP} **t*' solving the problem *t*]]]
 b. * *How* did you hear [_{NP} a rumour [_{CP} **t*' that John had solved the problem *t*]]
 c. * *How* did [_{CP} **t*' to solve the problem *t*] surprise John

In (25a), (28a) the adjunct PP is a barrier for *t*' because PP was merged with VP, a complex category, at some step of the derivation. Hence, PP is a barrier for *t*'. Following Stowell (1981), Kiss (1990), Grimshaw (1992), and Takahashi (1994), I assume that the embedded *that*-clause in (25b), (28b) is not an argument CP of the noun *rumor*, but instead an appositive clause which is a structural adjunct. The explanation for (25a), (28a) then extends to (25b), (28b). The adjunct CP is a barrier for *t*' because the CP was merged with NP/DP at some step of the derivation. The explanation given for (25a-b) and (28a-b) also extends to extraction from relative clauses such as (29). Here again, the relative clause was merged with a non-head, hence it is a barrier for extraction:

(29) * *Which book* did John have [_{NP} a friend [_{CP} to whom [to read **t*]]]

Let us consider next (25c) and (28c). These examples are ungrammatical for the same reason as (30c) is ruled out. Extraction out of subjects is also excluded since the subject was merged with a complex category. The CP/NP subject island in both examples is merged with V' (or Infl'). Consequently, the subject NP is a barrier for *t* in (30c) and the subject CP is a barrier for *t*' in (25c) and (28c). A similar explanation can be given for the impossibility of extraction out of adjunct PPs (30a):

- (30) a. * *Which movie* did you sleep [_{PP} during **t*]
 b. *Of whom* did Mary take [_{NP} pictures *t*]
 c. * *Who* do you think [_{CP} *t*' that [_{IP} [_{NP} pictures of **t*] are on sale]]?

(26) correctly allows for extraction out of phrase structural complements in general. Hence extraction is possible out of VPs and IPs (27), sentential complements (31a) as well as out of NP complements (30b), since in all these cases extraction takes place out of a constituent that was merged with a head. Extraction of subjects out of small clauses is possible (31c) as ordinary subject extraction since again the small clause was merged with a head, the matrix verb:

- (31) a. *What* did Mary say *t*' that John bought *t*
 b. ?? *What* do you wonder [_{CP} how John could fix *t*]
 c. *Who* does John consider [_{SC} *t* stupid]

However, extraction out of subjects of small clauses is correctly excluded (32):

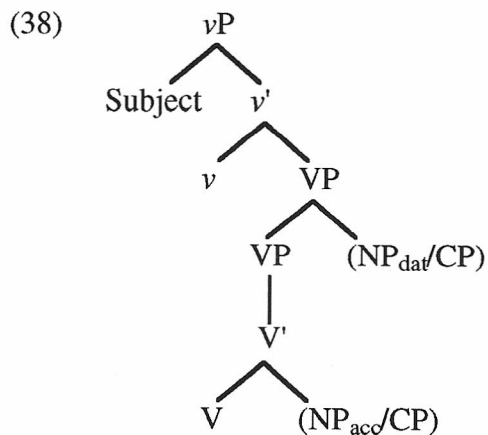
- (32) a. * *Of whom* does John consider [SC [NP friends **t*] idiotic]
 b. * *Who* does John believe [IP [NP a friend of **t*] to be stupid]

As was already shown in (30b), extraction of *wh*-phrases from a direct object is generally possible in English (see also (36)), however extraction from an indirect object is much less acceptable (37). The following examples are taken from Johnson (1985:48):

- (36) a. *Who* did you see [a sister of *t*]
 b. *Who* did you buy [a book about *t*]
- (37) a. * *Who* did John give pencils to [friends of *t*]
 b. * *Of whom* did John give pencils to [friends *t*]

The same situation (with DP/NP- and CP-arguments) can be found in other languages such as for example Spanish (Demonte 1987, Kempchinsky 1992), Italian (Cinque 1990:39) and German (den Besten 1985, Müller 1995, Sabel 1996b:189, among others). If we follow the analysis of double object constructions in Aoun and Li (1990) (see also Cinque 1990 and Sabel 1996b:33-37, 188-192 for a similar suggestion), who assume, as shown in (38), that the goal argument in (37b) is a structural VP-adjunct (in analogy to passive constructions), the impossibility of extraction in (37b) can be accounted for in a line with the ungrammaticality of extraction from adjuncts (28a-b), (29), (30a).

Note that this account relies on standard assumptions about VP-structure in SOV-languages (see Sprouse 1989, Santorini 1991, Haider 1992, Webelhuth 1992 for German) and SVO-languages (see Bordelois 1988 and Kempchinsky 1991, 1992 for Spanish) according to which the accusative object is the closest argument of the verb. Then, English (and Spanish) displays the VP structure depicted in (38), due to its SVO nature.



Let us now turn to *wh*-in-situ. Given that in (26) barriers are defined for movement, it follows that (26) does not rule out (39), assuming that the [+*wh*]-features of the in-situ *wh*-phrases are unselectively bound (in the sense of Baker 1970), as argued in Tsai (1994), Reinhart (1995) and Chomsky (1995, chapter 4).

- (39) a. *Who t* went out [PP without [CP PRO talking about what]]
 b. *Who t* heard [NP a rumor [CP that John had read what]]
 c. *Who* did [CP that you had paid what] surprise *t*

Furthermore, we now have the solution for the problem mentioned at the beginning of this section in connection with (25) repeated here as (40):

- (40) a. * *What* did Sam go out [PP without [CP **t'* PRO talking about *t*]]
 b. * *What* did you hear [NP a rumor [CP **t'* that John had read *t*]]
 c. * *What* did [CP **t'* that you had paid *t*] surprise you

The intermediate traces *t'* are *-marked because the extracted phrases violate (26) i.e., because they cross barriers. But - according to the *Uniformity Condition* - this trace has to be deleted at LF, and the resulting chain (*Wh*, *t*) represents a legitimate LF-object. Consequently, the ungrammaticality of these examples remains unexplained.

As already pointed out at the beginning of this section, a possible solution would be found if we could derive the result that the intermediate traces in (40) cannot be deleted. Then what remains at LF in (40) are the chains (*what*, **t'*, *t*), which violate the *Uniformity Condition* and therefore the principle of Full Interpretation. These chains may therefore not be checked by the ECP. On the other hand, in corresponding examples that involve adjunct extraction, as in (28), the resulting chains (*how*, **t'*, *t*) are uniform, hence they violate the ECP but not the *Uniformity Condition*.

The fact that different violations are involved in (40) and (28) may also provide the reason for the fact that the violations in (28) are often judged as being stronger than those involving argument extraction, as in (40).

Now we have to ask why deletion of argument-traces occurring inside of CED-islands is impossible. To provide an answer to this question, we can rely on an observation made in Epstein (1995), according to which a term A can enter into a syntactic relation with a term B only if the two were not part of trees that were *unconnected* at some point of the derivation.

The notion *unconnected* refers here to a consequence of phrase-structure building in bottom-up theories like Merger theory in Chomsky (1994, 1995). In this theory, phrase markers are sometimes built in parallel as locally independent subtrees i.e., as phrases which are not constituents of the same tree at a certain point during the phrase structure building. This is always the case when *Merge* joins two complex terms as in (25). The (complex) subject and the (complex structural) adjuncts in (25) are merged with VP/IP. These complex terms which are joined by *Merge* have been built before as independent complex subtrees i.e., as *unconnected* trees. Note that this situation never arises with respect to the building of phrase structural complements. Consider for example a verb and its DP object. The (complex) object is merged with a *non-complex* term in this case, the head V°. The same holds for the relation between I° and VP and C° and IP. In other words, a complement is never *unconnected* in the sense outlined above.

Unconnectedness can only be found in connection with CED-islands. These complex subtrees (T₂'s in the sense of (26)) differ from complements since only the former XPs were unconnected to another complex tree (for example VP or Infl') during several stages of the derivation. Now consider the intermediate traces in (40). Clearly, the intermediate traces in (40) were part of the PP/CP trees which represent the barriers. These subtrees were unconnected to another complex tree at several stages of the derivation. Assuming that deletion of intermediate traces depends on a syntactic relation between the members of the chain in question, and that this relation does not hold in (40), we derive the desired result: The impossibility of intermediate trace deletion in (40).

Note that the proposed account provides indirect evidence for the presence of intermediate traces in Spec CP positions that intervene between the base and the goal

position of an extracted *wh*-phrase. With respect to CED-islands, an analysis of argument (40) and adjunct (28) extractions that does not rely on intermediate traces in Spec CP would predict that both extraction types should leave chains of the form (*wh*, **t*). Then, the examples in (28) and (40) should be equally bad, but, as already pointed out, this prediction is not borne out.¹⁵

To sum up, in this section, I have proposed an account for the ungrammaticality of the CED effects in the framework of Chomsky (1994, 1995 chapter 4) that is compatible with the a) the impossibility of intermediate adjunction and with the Minimal Link Condition as the only remaining locality concept in the Minimalist Programm.

6. REMAINING QUESTIONS

In the last section, I have tried to show that CED-island effects may be derived from minimalist assumptions i.e., from the way *Merge* concatenates categories. This analysis raises several further questions which will be discussed in this section.

6.1. Other Languages

An important issue left open by the preceding discussion, concerns the fact that although subjects are islands for extraction in English this is not necessarily the case in other languages. For example, VOS languages like Palauan (Georgopoulos 1985, 1991) and Malagasy (Travis and MacLachlan 1992), VSO languages like Chamorro (Chung 1990), SOV languages like Japanese (Saito 1994) as well as SVO languages like Akan and Tuki (Saah 1992) seem to allow for *wh*-extraction out of sentential subjects (and other islands) very freely. Note, however, that this does not imply that the proposed account for CED islands phenomena fails in its general form. The mentioned island-insensitivity can be argued to be due to independent properties of the particular languages in question. For example, it must be clarified whether *wh*-questions in a language tolerating violations of CED-islands are derived by movement or by base-generation of *wh*-elements in a clause-peripheral position, leaving an (overt, or empty) resumptive pronoun in the position of the putative extraction site. The latter perspective is adopted by Georgopoulos (1985, 1991) for *wh*-construction in Palauan.

Further investigation shows that this kind of displacement variability also exists for apparently different "extraction" phenomena in one and the same language. For example, the absence of island effects with respect to topicalization from adjuncts in Japanese is taken by Saito (1985, 1987) and Hoji (1985) as an indication for the fact that topicalization in Japanese results from base-generation although *wh*-questions and scrambling are derived by movement (see also Hasegawa 1986 and Yoshimura 1987 for discussion). Similar asymmetries between movement types exist in Egyptian Arabic (Wahba 1984) where topicalization (and relativization) is immune to island constraints in contrast to *wh*-movement. On the other hand, in languages such as German and English, topicalization and *wh*-questions respect islands and are best analyzed as movement phenomena.

The absence of subject effects with respect to *wh*-questions in a given language with *wh*-movement can be due to a difference in the way in which *Merge* operates in that language. For example, Woolford (1991) argues on the basis of *c*-command asymmetries in several verb-initial languages that subjects are base-generated as a sister of the verb.

¹⁵ For a discussion of PP-extraction from CED-islands, which is worse than the extraction of NPs, see Lasnik and Saito 1992, section 5.1.2.

Recall that *Merge* is a binary structure-building operation. Hence, if subjects in these languages are merged as a sister of the verb we predict on the basis of the notion of a barrier in (26) that they are transparent for extraction whereas objects should be islands. This is exactly the situation found in Malagasy and other Western Austronesian languages, where in addition, subjects are much more extractable than objects.

Furthermore, as is well-known, some languages such as Polish disallow for *wh*-extraction from tensed complements (41a) whereas non-tensed complements are transparent for *wh*-extraction (41b) (see Toman 1981, Borsley 1983, Lasnik und Saito 1984, Pesetsky 1987, Willim 1989, and Hornstein und Lightfoot 1991).

- (41) a. * *Co Tomek mówi [_e Maria wie t] ?*
 'What does Tomek say that Mary knows?'
 b. *Co Jan choia_ [kupi_ t]?*
 'What does John want to buy?'

Witkos (1995:253) has argued that this extraction asymmetry could be explained if Polish tensed complements are in the same structural position as indirect objects i.e., adjoined to VP as in (38).

If this line of reasoning is on the right track, then (some) cross-linguistic asymmetries with respect to CED-violations follow from the fact that languages may differ with respect to their base- or VP-structure (see also Haider 1983, Sabel 1996b: 201).

6.2. Reconstruction Asymmetries

The unitary analysis of (28a-b) and (40a-b) raises the question of whether we lose the account of Principle C anti-reconstruction asymmetries discussed in Lebeaux (1988), Webelhuth (1992:172ff.), Chomsky (1993). Consider (42):

- (42) a. [which claim [_{CP} *O* that John_i made *t*]] was he_i willing to discuss *t*_{wh}?
 b. * [which claim [_{CP} that John_i was asleep]] was he_i willing to discuss *t*_{wh}?

In (42a) coreference between the R-expression contained in the *wh*-phrase is possible whereas it is not in (42b); only (42b) represents a violation of Principle C. The analysis of the contrast in (42) presented in Lebeaux (1988) and Chomsky (1993) relies on the idea that the complement clause in (42b) is already part of the *wh*-phrase before *wh*-movement takes place whereas the relative clause in (42a) is adjoined to the *wh*-phrase after it has moved to Spec CP. Then, according to the above mentioned authors, the contrast in (42) can be accounted for by either assuming that only in (42b) was there a stage of the derivation at which PR C was violated or by assuming that only in (42b) the clause containing the R-expression is part of the copy of the moved *wh*-element and therefore causes a PR C violation at LF (see Chomsky 1993, Kitahara 1995, 1997:120).

Given my analysis of complement clauses of nouns as structural adjuncts as in (28b) and (40b) this account for the contrast in (42) is not necessarily lost since – although there is no structural distinction between sentential complements of nouns (42b) and sentential non-complements of nouns (42a) the idea that several adjuncts are not attached at the level of "D-" or "base"-structure could still serve as the basis for an account of the difference found in (42). On the other hand, it has already been observed that the above mentioned explanation for the contrast in (42) cannot be correct since the explanation for (42) is based on a wrong empirical generalization. As pointed out by Heycock (1995), the contrast in (43) suggests that some arguments need not reconstruct

i.e., "referential" arguments as (43b) (where the question is about a set of lies that is presupposed to exist) in contrast to (42b), (43a).

- (43) a. * How many lies aimed at exonerating Clifford_i do you think he_i may come up with t_{wh} ?
 b. How many of the lies aimed at exonerating Clifford_i did he_i claim that he_i had no knowledge of t_{wh} ?

Consider also the examples in (44) which are due to H. Lasnik (cited in Watanabe 1995). Again a "complement" of a noun (44a) behaves like an "adjunct" (44b) with respect to reconstruction and Principle C:

- (44) a. Which piece of evidence [that John_i was asleep] was he_i willing to discuss t_{wh} ?
 b. Which piece of evidence [\emptyset that John_i discovered t] was he_i willing to discuss t_{wh} ?

Hence the generalization which states that a structural asymmetry of the CPs in brackets in (42) is the reason for the reconstruction asymmetry in (42) is empirically problematic. The examples (43)-(44) show that the Principle C reconstruction asymmetry is not due to a structural complement/adjunct contrast but due to the semantic nature of the *wh*-phrase.¹⁶

6.3. CNPC Asymmetries

Under the analysis of *wh*-islands and CED-effects presented in this paper, it is unclear why violations of the CNPC such as (40b), repeated here as (45a), provide a weaker island effect than complement extraction from relative clauses as in (45b) (= (29)) which display a very strong violation that is equal to an ECP effect.

- (45) a. * *What* did you hear [_{NP} a rumor [_{CP} * t' that John had read t]]
 b. * *Which book* did John have [_{NP} a friend [_{CP} to whom [to read * t]]]

¹⁶ For further interfering factors which may affect the distribution of Principle C reconstruction effects, see Guéron (1984), Lebeaux (1991), Speas (1991), Chomsky (1994), Takano (1995). For example, Speas (1991) (citing Chomsky class lectures) and Lebeaux (1991) point out the problem that agreement on judgements of grammaticality is often difficult to get with Principle C effects and that in addition, ("partially unsolved" (Chomsky 1994:22)) fundamental questions remain for an account of the distribution of Principle C effects i.e., not only the 'depth of embedding' (Guéron 1984:145, Huang 1993) affects the possibility of coreference in examples like (i):

- (i) a. * In *John's* apartment, *he* spends a lot of time.
 b. In the apartment *John* just rented, *he* spends a lot of time.

"Opacity" induced by genitive phrases is also a case in point. Compare (ia) with (ii) (examples from Speas 1991:248 and Lebeaux 1991:212, 237):

- (ii) a. *Mary's* cat, *she* likes.
 b. Which of *Mary's* cats does *she* like?
 (iii) a. ?? *Mary's* pictures of *John*, *he* really likes.
 b. * Whose examination of *John* did *he* fear?

As already mentioned in the text, an additional interfering factor consists in the semantic nature of *wh*-phrases that contains the R-expression, as discussed at length in Heycock (1995).

It could be argued that in contrast to (45a) no intermediate trace can be generated in (45b) because the intermediate Spec CP position is occupied by the relative pronoun. Note that this explanation is not undermined by the multiple specifier analysis proposed in section 4. It is plausible to assume that in contrast to embedded interrogative complements, the C-head of relative clauses may not project a second specifier position in which a *wh*-moved element can create an intermediate trace. The reason for this may well lie in different feature specifications of complementizer types of embedded [+*wh*]-C°-heads and the C°-heads of the relative clauses (see, for example, Rizzi 1990a, chapter 2). Given the asymmetries between relativization and *wh*-movement, the idea that the C-system in relative clauses and *wh*-questions has different properties is independently justified. For example, relativization across *wh*-islands is often perfectly well-formed in contrast to movement of *wh*-phrases in interrogatives (Maling 1979, Rizzi 1982:51ff, Rudin 1988):

BULGARIAN

- (46) Vidjah edna kniga, *kojato* se *_udja* [_{CP} koj znae [_{CP} koj prodava *t*]]
 saw-1S a book which wonder-1S who knows who sells
 'I saw a book which I wonder who knows who sells(it).'
- (47) * [_{CP} *Kakvo* se *_udi_* [_{CP} koj znae [_{CP} koj prodava *t*]]]
 what wonder who knows who sells
 'What do you wonder who knows who sells?'

ICELANDIC

- (48) *petta er lagi_*, sem enginn vissi hver samdi.
 'This is the song that no one knew who wrote.'
- (49) * *Hva_* vissi enginn hver hefur skrifa_ *t* ?
 'What does no one know who wrote?'

Furthermore, we find multiple *wh*-movement but never multiple relativization. Relative pronouns may never occur in-situ in contrast to *wh*-elements; relative pronouns in English license resumptive pronouns in contrast to interrogative *wh*-phrases (Safir 1986), *that-t* and weak crossover effects are absent in relativization, in contrast to *wh*-movement (Chomsky 1981, 1982). Finally, Horvath (1986:48ff.) compares both movement types in Hungarian, showing that the landing sites of relative pronouns differ from the landing sites of interrogative *wh*-elements. This asymmetry is also found in Italian, where according to Rizzi (1995) relative operators and *wh*-operators occupy different positions i.e., the former must precede topics, in contrast to question operators (see Brandon and Seki 1981 for further languages of this type and Tajima 1987, Tajima and Arimura 1988 for further differences between *wh*-movement and relativization in English and Japanese; see also Müller and Sternefeld 1993 for differences between both movement types in German).

To conclude, the explanation for the strong ungrammaticality of (45b) given above can be maintained. It relies on the idea that in contrast to CNPC-violations such as (45a) no intermediate trace in an A'-position is created inside the relative clause and the resulting chain (*Wh*, **t*) in (45b) violates the ECP and not the *Uniformity Condition*.

6.4. Additional Island-Effects

Several island phenomena have not been subsumed under the present account, as, for example, island effects in connection with negative elements, as in (50), or bridge and non-bridge verbs, as in (51a) vs. (51b):

- (50) a. Why did (*n't) John leave ?
 b. How did (*n't) John fix the car ?
- (51) a. * Who did Peter whisper that Mary likes ?
 b. Who did Peter think that Mary likes ?

The barrierhood of factive complements (50a) and negative elements could be explained along the lines of Melvold (1991), Rizzi (1992), Watanabe (1993) (among others) i.e., by assuming that a factive empty operator is base-generated in the embedded Spec CP position of a [-*wh*]-C° or in the specifier position of NegP. This empty operator is then attracted by the matrix C°-head as in the analysis in (11b). Melvold argues that extraction from factive islands is blocked by an empty operator in the Spec CP position of the factive complement (see also Watanabe 1993b) which binds an event position in the complement of the factive verb thus accounting for its referential property. According to Melvold (1991) island effects with respect to *wh*-extraction from factive complements have to be explained in analogy to *wh*-island violations.

Alternatively, one could analyze factive complements as in Cinque (1990:30) who assumes that these complements are not generated as sisters of V. Then it follows from (26) that they are barriers for extraction.¹⁷

¹⁷ Furthermore, island effects in connection with remnant movement phenomena as in (i) have not yet been subsumed under the present account. Although the complex NP in (i) is base-generated in complement position, this NP is an island for extraction:

- (i) a. * *Who* were [_{NP} pictures of *t*] taken *t*_{NP}
 b. * *Who* were [_{NP} stories about *t*] told *t*_{NP}

In Collins (1994) and Chomsky (1995) it is assumed that extraction must take place from the NP in Spec IP position. Then, the explanation for the islandhood of the NP is analogous to extraction from subject NPs in general. However, arguments that an alternative account of remnant movement phenomena is in fact necessary are discussed in Grewendorf and Sabel (1994, 1996), Sabel (1996b), Müller (1998). For example, consider a remnant movement asymmetry such as the contrast between remnant scrambling (ii) which is ungrammatical and remnant topicalization which is possible in principle (iii):

- (ii) a. * daß [den Hund]₂ zweifellos [*t*₂ zu füttern]₁ keiner *t*₁ versuchte
 that the dog_{acc} undoubtedly to feed nobody_{nom} tried
 b. * daß [*t*₁ zu füttern]₂ zweifellos [den Hund]₁ keiner *t*₂ versuchte
 that to feed undoubtedly the dog_{acc} nobody_{nom} tried
 'Undoubtedly, nobody tried to feed the dog.'
- (iii) [*t*₁ zu füttern]₂[_C hat [_{IP} [den Hund]₁ [_{IP} zweifellos [_{IP} keiner *t*₂ versucht]]]]
 to feed has the dog_{acc} undoubtedly nobody_{nom} tried
 'Undoubtedly, nobody tried to feed the dog.'

(iia) and (iib) show that scrambling out of a scrambled category is impossible in German, irrespective of whether or not the scrambled XP binds its trace. In (iib) the accusative object is first scrambled to its surface position and then the infinitive remnant containing the trace of the object is scrambled to a higher position, resulting in a configuration in which the object will no longer c-command its trace. In (iia) the infinitive clause is first (short) scrambled and then the accusative object is scrambled higher

7. SUMMARY

In this paper, I have argued that asymmetries in *wh*-island violations in different types of languages may be accounted for by the Minimal Link Condition (and the notion *Attract F*) if it is additionally assumed that CP may contain multiple specifiers which each provide a position for feature checking. The implicit idea of this analysis in terms of multiple specifiers is that movement universally proceeds in a successive cyclic manner.¹⁸

In addition I have argued that CED-island effects can be derived from the way *Merge* concatenates categories. Firstly, this provides an account for the well-known contrast between adjunct and argument extraction. Secondly, concerning the variabilities of CED-islandhood in different languages I have argued that these might either result from the fact that *Merge* concatenates verb and subject/object in a different order or that *wh*-constructions do not result from movement at all but rather by base-generation. Again, this analysis of CED-islands is fully in accordance with the Minimal Link Condition (and *Attract F*).

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out of this XP, leaving only c-commanded traces. As can be seen from (iii), there is a contrast between scrambling out of a scrambled category and scrambling out of a topicalized category. This contrast in (ii) vs. (iii) obviously does not result from the way *Merge* operates – instead it results from a difference in the target of movement, i.e. a difference between remnant movement to specifier (iii) or to adjoined positions (ii).

¹⁸ Rizzi (1982) argues for a different view, according to his analysis, *movement* is parameterized with respect to the question of whether it obeys the subjacency condition or not. A further possibility is to assume that *phrase structure* is parameterized (see for example Reinhart 1981). Under this view, the relevant differences can also be derived from the lexical properties of functional categories.

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Résumé

Expliquer les ISLAND EFFECTS à l'intérieur du Programme Minimaliste demeure très difficile, car le fait d'adopter le *Minimal Link Condition* (MLC) comme la seule contrainte sur le mouvement, tel qu'on le fait dans le Programme Minimaliste (Chomsky 1995, chapitre 4), ne nous permet pas de rendre compte de certaines des caractéristiques fondamentales du mouvement, telles les asymétries dans l'extraction des mots *wh* des îlots *wh* qu'on expliquait traditionnellement à l'aide du ECP et du concept de SUBJACENCY. De plus, on perd une explication pour les autres phénomènes reliés aux îlots, les soi-disants effets de CED. Chomsky (1995) suppose que Infl, v° , et C° sont des catégories fonctionnelles qui se trouvent dans la structure syntagmatique et que les catégories fonctionnelles d'Infl et v peuvent projeter des spécificateurs multiples. Je propose qu'on peut expliquer la variation vis-à-vis les îlots *wh* à travers les langues si on suppose que C° peut lui aussi projeter des spécificateurs multiples. En outre, je montrerai que la nature des îlots CED résulte de l'opération *Merge*.