# Binding Condition C and Derivation by Phase[1]

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## 1 Introduction

In earlier theories of generative grammar (e.g. Chomsky 1981), the checking of binding conditions has generally been assumed to take place at Surface-structure or at Logical Form, LF, after reconstruction (see Belletti and Rizzi 1988, among others for applying binding theory at Deep-structure). Up till Chomsky 2001, the assumption has been that the syntactic derivation continues after spell-out to LF. But with the introduction of the notion of phase, all three syntactic levels have been integrated into the derivation. Spell-out applies at each strong phase, vP and CP (and possibly DP). The consequence of this is that there is no 'final' LF where reconstruction can take place (Chomsky 2001:4). One specific problem with binding theory is how to account for the apparently different behaviour of arguments and adjuncts. This paper concentrates on adjuncts and binding condition C. The reason for dealing with only condition C is that the other binding conditions rely heavily on the syntactic relation government, a relation that has no real correspondence in current syntactic theory. The outline of the paper is as follows. The second section gives a brief description of binding in general and Logical Form. The third section gives a brief overview of Chomsky's (1993) analysis of binding condition C. The purpose of this section is to give a background to the fourth section. The fourth section gives an outline of Epstein et al.'s (1998) derivational approach to syntactic relations. The fifth section is a brief overview of the latest development within the minimalist program, derivation by phase (Chomsky 1999, 2001). The sixth section is a new approach to the analyses of binding condition C and adjuncts. The last section is a conclusion of the paper and a discussion of some of the things that have not been covered in this paper.

## 2 Binding

This section gives a brief introduction to binding theory. Binding theory is the module of the grammar that assigns appropriate interpretations to referential expressions (R-expressions), pronouns and anaphors.

Chomsky (1982:78-83) distinguishes two features, *anaphor* and *pronominal* to characterize DPs. An element that is anaphoric always gets its interpretation by means of its relation to its antecedent. Chomsky assumes that there is a domain of 'entities'. An R-expression denotes an entity in that domain by virtue of the R-expression's inherent properties. An element that is pronominal may denote an entity in the domain by means of a linguistic antecedent or some contextual indication. Since the two features *anaphor* and *pronominal* can have the value + or – we get a set of four different types of DPs, of which only three are overt (see below). The non-overt categories will not be dealt with in this paper. The overt types of DPs are the following:

A **Reciprocals and reflexives**
[+Anaphor, -Pronominal]

[1] I am very grateful to Christer Platzack for valuable comments on an earlier draft of this paper.

B **Pronouns**
[-Anaphor, +Pronominal]

C **R-expressions**
[-Anaphor, -Pronominal]

The binding theory is generally assumed to have three different conditions or principles, A, B and C. They apply to the DPs above in the following way:

**Condition A**: A DP with the feature [+Anaphor] must be bound in its governing category.
**Condition B**: A DP with the feature [+Pronominal] must be free in its governing category
**Condition C**: An R-expression must be free everywhere.

A DP with the features [+Anaphor, +Pronominal] cannot be an overt element. This follows from the case filter, according to which a DP must have case, and case is assigned under government. It follows from conditions A and B that a DP with the features [+Anaphor, +Pronominal] must be ungoverned; hence it cannot be assigned case.

The definition of A (argument)-binding is the following:

$\alpha$ A-binds $\beta$ if and only if
i. $\alpha$ is in an A-position;
ii. $\alpha$ c-commands $\beta$;
iii. $\alpha$ and $\beta$ are coindexed.

When binding relations are checked there is a matching of $\Phi$-features. These features include person-features, number-features and gender-features. Examples of the binding conditions are shown in (1) to (3).

(1a) $\text{Mary}_i$ saw $\text{herself}_i$.
(1b) *$\text{John}_i$ saw $\text{herself}_i$.

(2a) $\text{Mary}_j$ saw $\text{her}_i$.
(2b) *$\text{Mary}_i$ saw $\text{her}_i$.

(3a) $\text{She}_j$ saw $\text{Mary}_i$.
(3b) *$\text{She}_i$ saw $\text{Mary}_i$.

In (1a) the anaphor *herself* is bound by the DP *Mary*. In (1b) condition A is violated. *John* cannot bind the anaphor since the F-feature gender does not match. In (2a) the pronoun *her* is free since the pronoun and the R-expression *Mary* are not coreferential; they are not coindexed. In (2b) condition B is violated since the R-expression and the pronoun are coreferential, i.e. coindexed. In (3a) the pronoun *she* and the R-expression, *Mary* are not coreferential and the R-expression is free. In (3b) on the other hand they are coreferential and the R-expression is not free. So condition C is violated.

In the GB-theory binding conditions were considered to hold at D-structure, S-structure or at Logical Form (LF) after reconstruction. The next section gives a short overview of logical form and reconstruction.

## 2.1 Logical Form

In the theory of government and binding (see for example Chomsky 1981) the assumption is that there are four levels of interpretation: deep structure (DS), surface structure (SS), phonetic form (PF) and logical form (LF). The phrase markers at SS are related to those at DS by means of transformational rules (Move α). The derivation from DS to SS is 'overt syntax' in the sense that the applications of the transformational rules have phonetic consequences. At SS the derivation splits into one track leading to PF and another leading to LF. The derivation from SS to LF is 'covert syntax'. It is still a syntactic derivation because the same rules apply (Move α) but covert in the sense that the applications do not have phonetic consequences. Hornstein (1995:3) characterizes LF as the level of linguistic representation at which all grammatical structure relevant to semantic interpretation is provided.

As examples of what semantic interpretation includes he mentions relative quantifier scope, scope of negation, modality, pronoun binding, focus and presupposition, among other things. Hornstein (1995:7) lists five generally accepted features of LF. First, in a GB-theory it is derived via Move α from S-structure. Second, this is the level where all grammatical information relevant to interpretation is combined. Third, it provides the accurate logical syntax for the interpretive apparatus. Fourth, LF is the level that disambiguates sentences. If a sentence has *n* interpretations it has *n* different LF phrase markers. Fifth, at LF, all grammars are identical. Whatever differences different grammars show at the surface, at LF they are alike. Hornstein (1995) gives as the strongest argument for this the poverty of stimulus. He gives the following citation from Higginbotham (1985:550).

> the most fundamental principles of semantics are so remote from the data available to the child (situations of utterance, the behavior of other speakers etc.) that it is quite plausible to suppose that these principles vary minimally or not at all from language to language, the differences that show up being attributable to local syntactic conditions.

Hornstein assumes that the 'most fundamental principles of semantics' must include the principles that determine LF structure. If this is the case then LF is too far away from children's experience to allow for different parameter settings in their grammars.

It is also possible to posit that LF must be uniform for all languages due to the interface conditions it must satisfy. Chomsky (1995:2) takes for granted that the language faculty has at least two components: a cognitive system that stores information, and performance systems that access that information and use it in different ways. Even though these performance systems are in part language specific they are not generally assumed to be specific to particular languages, i.e. they do not vary as linguistic environment varies. LF is the interface level with the conceptual-intentional performance system, C-I. Since C-I is assumed to be the same for all humans it is reasonable to assume that the conditions that C-I imposes on LF make this interface level uniform too.

### *2.1.1 Reconstruction*

Reconstruction is an operation that takes place at LF. Reconstruction means that a moved phrase is treated as if it were in its trace position. What has been covertly moved is 'moved back' to allow for binding and scope relations to get their proper interpretations. If we look at (4) we see that the pronoun *he* can be coreferential with *John*. Even though *John* c-commands

*he*, *John* is outside the governing category of *he*, which means that there is no violation of condition B.

(4) John wondered [which picture of Bill]$_i$ he saw $t_i$.

Following this line of reasoning the interpretation where *Bill* is coreferential with *he* should also be possible, contrary to facts. In (4) *Bill* is not in the governing category of *he* so *Bill* does not bind *he*. Therefore there is no violation of binding condition B. But if we reconstruct the sentence, that is, if we interpret the moved wh-phrase in its trace-position as in (5) we see that there is a clear condition C violation.

(5) John wondered he saw [which picture of Bill].

In (5) *he* c-commands and binds *Bill,* which is an R-expression and must be free according to condition C. The assumption is that a question is signalled by a wh-element in spec-CP. In (5) there is no information that the subordinate clause is a question. Therefore the wh-operator must remain in place and take scope over the subclause when reconstruction applies. So the LF representation of (4) looks like (6).

(6) John wondered [which x] he saw [x picture of Bill].

In (6) the wh-operator, *which*, remains in spec-CP and the restriction of the operator, *picture of Bill*, is moved back to its trace-position. In this way we can explain why *he* and *Bill* cannot be coreferential and why the subclause is interpreted as an interrogative clause.

Chomsky (1993) proposes that UG has only two levels, LF and PF. These are the minimal number of levels that any theory of grammar must postulate since natural language sentences obviously are pairings of sound and meaning. Hornstein (1995) gives several implications of this theoretical turn. One of them is the consequence that the Binding Theory (BT) can only apply at LF. The next section gives a brief overview of Chomsky's 1993 analysis of binding condition C.

## 3 A Minimalist Analysis of Binding Condition C

This section gives a brief review of Chomsky's (1993) analysis of binding condition C. Chomsky states that reconstruction is a peculiar operation and that it should be dispensed with. In order to get rid of reconstruction Chomsky introduces the 'copy theory' of movement. In the copy theory of movement the trace left behind is not a trace but a copy of the moved element. A copy is an exact match of features. Consequently a chain is a series of identical elements. At spell-out only one copy reaches PF. But at LF all copies are available for interpretation. Since there are no traces but only copies there is no need for moving elements back; the material for the interpretations in LF is already in position, making reconstruction superfluous (reconstruction in the sense of moving elements back). Chomsky (1993) modifies the binding conditions as follows (where D is relevant local domain):

A. If $\alpha$ is an anaphor, interpret it as coreferential with a c-commanding phrase in D.
B. If $\alpha$ is a pronominal, interpret it as disjoint from any c-commanding phrase in D.
C. If $\alpha$ is an R-expression, interpret it as disjoint from every c-commanding phrase.

Some of the examples that are discussed are the following (from Epstein et al:1998):

(4) John$_j$ wondered [which picture of Bill$_i$] he$_{*i/j}$ saw t.
(7) [Which claim [that John$_i$ was asleep]] was he$_{*i}$ willing to discuss t. (Epstein et al's (12a))
(8) [Which claim [that John$_i$ made]] was he$_i$ willing to discuss t. (Epstein et al's (12b))

In a derivation where movement leaves copies (4) looks like (9).

(9) John wondered [which picture of Bill] he saw (which picture of Bill).

Chomsky (1993:41) introduces what he calls the preference principle: try to minimize the restriction in the operator position. The preference principle states that as much as possible after the wh-operator *which* should be deleted and replaced with a variable, x. Applied to (9) the preference principle gives the LF representation (6).

(6) John wondered [which x] he saw [x picture of Bill].

The difference in Chomsky 1993 and the earlier analyses within the Government and Binding theory is that the fact that movement leaves copies makes it possible to get rid of the moving 'back' part of reconstruction.

If we look at (7) and (8), we get different results concerning the coreferentiality between *John* and *he*. In (7) *John* must be disjoint from *he,* whereas in (8) *John* and *he* can be coreferential. The that-clauses in (7) and (8) are of two different types. In (7) [that John was asleep] is an appositive clause and [that John made] in (8) is a relative clause. The assumption is that the appositive clause is an argument and that the relative clause is an adjunct.

Building on work by Van Riemsdijk and Williams (1981), Freidin (1986) and Lebeaux (1988), Chomsky (1993:36) introduces the following distinction between arguments and adjuncts: arguments must be cyclically merged, hence before *wh*-movement, while adjuncts can be merged non-cyclically, hence after *wh*-movement. In derivations where movement leaves copies instead of traces, (7) and (8) look like (10a) and (10b), respectively.

(10a) [$_{wh}$Which claim [that John was asleep]] was he willing to discuss ($_{wh}$which claim [that John was asleep]).
(10b) [$_{wh}$Which claim [that John made]] was he willing to discuss ($_{wh}$which claim).

In (10a) the argument [that John was asleep] is merged cyclically and leaves a copy in the base position when the wh-phrase moves. In (10b) the adjunct [that John made] is non-cyclically merged after the *wh*-phrase has moved to [Spec, CP]. The non-cyclic merge results in there not being a copy of the adjunct in the base position. In LF the preference principle applies, so the restriction in the operator position should be minimized. The LF representations of (10a) and (10b) are given in (11a) and (11b).

(11a) [Which x,] was he willing to discuss [x claim [that John was asleep]].
(11b) [Which x, x claim [that John made]] was he willing to discuss [x].

In (11a) the restriction in the operator position is minimized according to the preference principle. In (11b) it is not possible to minimize the restriction since there is no copy of the adjunct available in the base position. To minimize the restriction would violate the principle

of recoverability of deletion[2]. If the restriction was minimized in (11b) the information in the adjunct [that John made] would be lost.

The result concerning condition C is that in (11a) *he* binds *John* and condition C requires that they be interpreted as disjoint from each other. And in (11b) *John* does not bind *he* and *he* does not bind *John* so *he* can take *John* as its antecedent without violation of the binding conditions B and C.

The next section is a brief introduction to a derivation approach to syntactic relations (Epstein et al.:1998). In this section we will see a different approach to binding condition C.

## 4 A Derivational analysis of binding condition C

This section gives a brief review of Epstein et al.'s (1998) analysis of binding condition C. But it starts with a short introduction to the derivational approach to c-command. (This is a very simplified version of their derivational approach to syntactic relations, but it will suffice for the purpose of this paper)

Epstein et al. propose the following definition of derivational c-command (1998:32):

> Derivational C-Command:
> X *C-commands* all and only the terms of the category Y with which X was paired/concatenated by Merge or by Move in the course of the derivation.

Following Chomsky (1994,1995), Epstein et al.'s definition of term is (1998:27,62):

> Definition of term ('constituent')
> For any structure K,
> i. L is a *term* of K iff L=K (the entire set or tree is a term),
> or
> ii. L is a term of K, if L is a term of the category concatenated to form K.

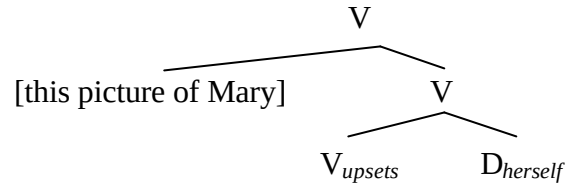
Furthermore they introduce what they call the First Law: the largest syntactic object is the single phrase structure tree (1998:39,40)

> The First Law
> A term (= tree, category, constituent) $T_1$ can enter into c-command relations with $T_2$ only if there exists no derivational point at which:
> i. $T_1$ is a proper subterm of $K_1$,
> and ii. $T_2$ is a proper subterm of $K_2$,
> and iii. there is no $K_3$ such that $K_1$ and $K_2$ are both terms of $K_3$.

The First Law states that there are no syntactic relations between members of two trees that at any point in the derivation were unconnected. With the help of these three definitions the syntactic relations, and the lack of syntactic relations in (12) and (13) can be explained.

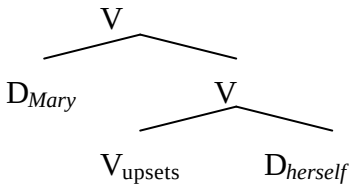
[2] The principle of recoverability of deletion requires that no information be lost in the deletion operation.

(12)



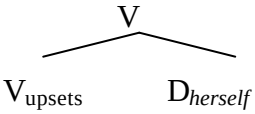

In (12) the first law prevents *Mary* ($T_1$) from entering into a syntactic relation with the anaphor *herself* ($T_2$). The reason is that at one point in the derivation, namely before [this picture of Mary] is merged to [Spec, V], *Mary* and *herself* belong to different structures that are unconnected. These structures are not connected until [this picture of Mary] ($K_1$) is merged to V [upsets herself] ($K_2$), to form the higher V [this picture of Mary upsets herself]. In (13), however, we do find a syntactic relation between the specifier *Mary* and the complement *herself*.

(13)

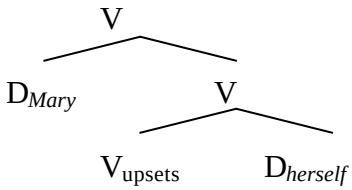



The derivation step by step of (13) looks like this:

(14) Merge 1.




(15) Merge 2.




In this derivation the first law is not a blocker to asymmetric c-command since at no point in the derivation were $D_{Mary}$ and $D_{herself}$ proper subterms of different trees.

After this very brief outline of the derivational approach to c-command, what follows is a review of how it is possible to handle binding condition C in this approach. First Epstein et al. make the following assumption (1998:62): there are no other linguistic levels except the derivation itself. The structure building operations, Merge and Move provide the interface systems directly. Syntactic relations are created derivationally and those relations enter interpretive procedures without mediation of linguistic levels. This means that the interpretive version of binding theory takes place in the course of the derivation and there is no need for a mediating level, LF. Furthermore, they suggest, with references to Belletti and Rizzi (1988) and Lebeaux (1988, 1991, 1995), that the derivational application of the interpretive processes be constrained as follows:

(16)

> The application of 'disjoint' interpretive procedures occurs at every point of the derivation, whereas the application of 'anaphoric' interpretive procedures occurs at any single point of the derivation.
>
> (Epstein et al. 1998:62)

The interpretive procedures are the same binding conditions that Chomsky (1993) gives (see the previous section). The implication of (16) is that binding conditions B and C (disjoint interpretive procedures) must be checked after every merge. If there is a violation of the conditions B or C the elements involved must have disjoint reference. Condition A (anaphoric interpretive procedure) is only checked one single time during the whole derivation of a clause.

Epstein et al.'s analysis of (4), (7) and (8), repeated here, looks like the following.

(4) John wondered [which picture of Bill] he saw t. (Epstein et al's (1))

At some point of the derivation of (4) the term *he* is merged to the category that contains *Bill*, (17).

(17) he saw [which picture of Bill]

(16) specifies that 'disjoint' interpretable procedures, binding conditions B and C, occur after every merge in the derivation. In (17) *he* binds *Bill*, hence condition C forces a disjoint interpretation of *he* and *Bill.*

(7) [Which claim [that John was asleep]] was he willing to discuss t. (Epstein et al's (12a))

In (7) *he* is merged to the category that contains [which claim [that John was asleep]], (18).

(18) he discuss [which claim [that John was asleep]]

In (18) *he* binds *John* and binding condition C gives rise to a disjoint interpretation of the R-expression *John* and the pronoun *he*.

(8) [Which claim [that John made]] was he willing to discuss t. (Epstein et al's (12b))

If the analysis of (7) is applied to (8), the result is a disjoint interpretation of the R-expression and the pronoun, contrary to facts. Epstein et al. makes the same assumption as Chomsky (1993) does: arguments have to be introduced in the derivation cyclically, whereas adjuncts can be introduced non-cyclically. If the adjunct [that John made] is merged after *wh*-movement in (8) *he* does not bind *John* and there are no binding violations and *John* and *he* can be coreferential. Epstein et al. point out the fact that there must be restrictions on when it is possible to merge adjuncts. If adjuncts could be merged at any point in the derivation sentences like (19) would be well-formed with the interpretation that *John* and *he* are coreferential.

(19) *He$_i$ was willing to discuss the claim [that John$_i$ made].

If the adjunct in (19) is merged after the pronoun *he* it should be possible to get coreference between *he* and *John*, since *John* only enters a syntactic relation with *claim*. But this is

contrary to facts. Epstein et al. make use of Kayne's (1994) Linear Correspondence Axiom, LCA to explain this. The LCA states that terms must asymmetrically c-command each other in order to get a well-formed PF output. If the adjunct [that John made] is late merged in (19) there is no syntactic relation between *John* and *he* which means that this is not a legitimate PF output, hence the derivation crashes. In (6) *wh*-movement takes place before the adjunct is merged. This contrast leads Epstein et al. to formulate the following generalization (1998:75):

> α must be introduced cyclically if no subsequent movement operation affects a category containing α.

This seems to be a generalization that goes against the spirit of a derivational approach to syntactic relations; how is it possible to know that a category will be affected by a movement operation if it only enters into relations with what is in the tree when it is merged? In section 6.2 I will give an alternative analysis where this contradictory generalization can be dispensed with, together with the appeal to the LCA as a reason for merging the adjunct cyclically in (19). But first I will give a short outline of the latest development in the minimalist program, derivation by phase.

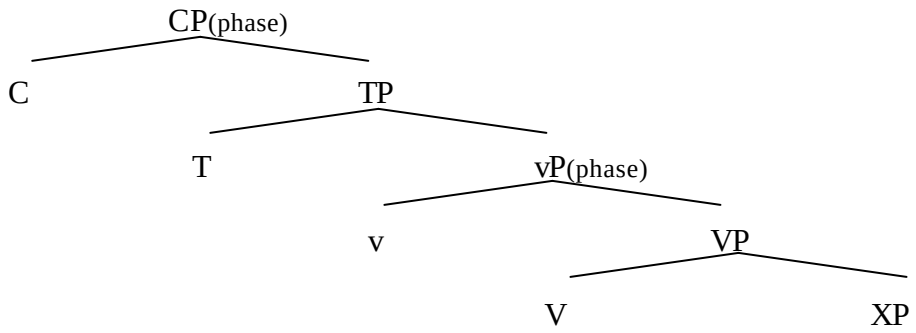
## 5 Derivation by Phase

This section is a brief introduction to Derivation by Phase (Chomsky 1999, 2001). The concentration is on things that have a direct bearing on the interpretation of condition C.

Chomsky (2001) claims that the language L generates a set of derivations. In each derivation D the last line is a pair <PHON, SEM >. The sensimotor system, SM accesses PHON and conceptual-intentional system, C-I accesses SEM. If PHON and SEM each satisfy the interface conditions, IC, D converges, otherwise D crashes at one or the other interface. A further assumption is that L has three components (2001:4): narrow syntax (NS), the phonological component F, and the semantic component Σ. L makes a one-time selection of elements, the lexical array (LA), from LEX (the lexicon) that the derivation D accesses. Narrow Syntax maps LA to a derivation $D_{NS}$, F maps $D_{NS}$ to PHON, and Σ maps $D_{NS}$ to SEM.

L contains an operation TRANSFER that hands the units of $D_{NS}$ over to Φ and Σ. As Chomsky points out (2001:4), there is no LF, strictly speaking, in this approach to syntactic relations, since LA is handed over to Σ 'piece-by-piece'. (However, he adds the disclaimer that SEM interprets units that are part of something similar to LF in a non-cyclic conception.) These piece-by-piece' units are called phases. Following Derivation by Phase (Chomsky 1999) Chomsky assumes that the phases are vP and CP, but not TP. This is illustrated in (20).

(20)



After the operation TRANSFER only the edge of the phase is available for the derivation. The edge is the head in the phase and its specifiers. The edge is an escape hatch for successive cyclic movement of the complement, which, if it remains in situ, must be spelled out at the operation TRANSFER. The fact that only the edge is available is formulated by Chomsky as the Phrase Impenetrability Condition, PIC.

There is only one operation that comes free in NS. That operation is Merge. Merge takes two elements (already constructed) α and β, and creates a new element consisting of the two, {α, β}.

The C-I system requires that SEM have the possibility to express various semantic properties. Among those properties are argument structure, or theta theoretic properties. Other properties included are scopal and discourse-related properties (new/old information, specificity, etc.). Chomsky (2001:7) reduces this collection of properties to duality: argument structure and everything else. IC therefore enforces duality of semantic interpretation at SEM.

Chomsky divides the unconstrained operation Merge into two types: external and internal Merge. If α and β are merged under external merge they are separate objects. If α and β are merged under internal merge one is part of the other. Internal merge is the reason for 'displacement' or movement. Internal merge leaves a copy in place (see section 3), which means that there is no need for reconstruction; it applies obligatory in the base position.

> K is a copy of L if K and L are identical except that K lacks the phonological features of L. (Chomsky's (7))

Both types of merge are constrained in the way they apply. Chomsky argues that the constraints are principled and it is not likely that they have to do with PHON since it lacks relevant structure. He ties the duality of merge to the C-I interface, as conditions on SEM. External merge (base structure) is associated with argument structure and internal merge (derived structure) is associated with the other properties of semantic interpretation.

What appears to an exception to the cyclicity of merge is late insertion of adjuncts (see sections 3 and 4) as in the contrast between (7) and (8).

(7) [Which claim [that John was asleep]] was he willing to discuss t.
(8) [Which claim [that John made]] was he willing to discuss t.

Chomsky (2001:15) claims that there is a clear asymmetry in adjunction constructions. The structure of NP-adjunction appears to be something like [NP XP]. In a construction where α is adjoined to β, the construction behaves exactly as if α is not there except for semantic interpretation. More importantly the adjunct α is not selected by β. To save the cyclicity of the operation merge (set-merge), a symmetrical operation that forms syntactic objects that are all binary sets {α, β}, (simple structure) Chomsky introduces the operation pair-merge, an asymmetric operation of adjunction that takes two objects α and β and forms the ordered pair <α, β>. α is adjoined to β. The natural answer to why pair-merge exists is, according to Chomsky, that '… interface condition[s] requires sufficient diversity at SEM. Possibly richness of expressive power requires an operation of predicate composition: that is not provided by set-merge, …' (2001:15). This is more or less the function of pair-merge. If this condition is imposed by the C-I system pair-merge is not an unexplained property of $S_0$.

Chomsky assumes that adjunction of α to β applies cyclically just like any other operation. Through the whole derivation β behaves as if it was set-merged in the structure. This is taken as an argument to believe that β actually is set-merged. Adjunction is then a substitution operation that replaces β with <α, β>. Since this is an ordered pair and not a set

the information that β was set-merged is retained in the asymmetry. If we look at the derivation step by step of (8) it will look as follows (abstracting away from irrelevant steps):

(8) [Which claim [that John made]] was he willing to discuss t.

Step 1: The DP [$_{DP}$ which claim] is set-merged (external merge) with *discuss*

Step 2: *He* is set-merged (external merge) to {discuss, which claim}. In this structure *he* c-commands *which claim*.

Step 3: The operation pair-merge applies substituting [which <claim, that John made>] for *which claim*.

Since the assumption is that pair-merge of α to β does not affect β the c-command relation between *he* and *claim* is preserved. The question is if *he* can extend its c-command to α, [that John made]. The answer is no, according to Chomsky because the extension of c-command to α would be a new operation. This operation is not empirically motivated, presumably because it is a non-cyclic operation.

According to Chomsky there is an operation SIMPL that converts <α, β> to {α, β}. Since this operation takes place at the same stage in the derivation as Spell-Out applies the natural assumption is that it is part of Spell-Out. Chomsky's conclusion is that SIMPL must apply at Spell-out, because if it was part of the operation TRANSFER we would get reconstruction effects on the copy in the base position in (8), since this copy is available to SEM after transfer.

The pair <α, β> becomes a simple structure at SEM when it is spelled out. So in (8) [which claim that John made] is a simple structure. The prediction is that if (8) is embedded we will get a Condition C violation. In (21) we see that we get the predicted result.

(21) *He$_i$ wondered [which claim that John$_i$ made] he was willing to discuss t.

In (21) the pronoun *he* in the matrix clause binds the R-expression *John*. According to condition C *he* and *John* cannot be coreferential.

The consequence of the operation SIMPL is that we will not find β spelled out in one place and α in another place as a result of movement of β. Chomsky claims that covert movement of β necessarily leaves α behind and that overt movement carries α along, and that principle (22) holds:

(22) In <α, β>, α is spelled out where β is. (Chomsky's (12))

The fact that relative clauses can appear as 'extraposed' in English as in (23) is explained by a kind of afterthought involving deletion (Chomsky 2001: 19).

(23) I gave him a painting yesterday from John's collection.

In (23) it appears as if the relative clause has been extraposed, but Chomsky claims that this is just a normal case of ellipsis of the underlined elements in (24).

(24) I gave him a painting yesterday (more precisely) <u>a painting</u> from John's collection.

The following section proposes a new approach to adjuncts, dispensing with the LCA and the operations pair-merge and SIMPL.

# 6 A new approach to adjuncts

There are some problems, if we choose to call them problems, with the two derivational approaches described in the two previous sections. The first one is the cyclicity of merge. Neither late merge nor pair merge are cyclic in a strict sense. In a true cyclic derivational approach $\alpha$ (adjunct) must necessarily be merged to $\beta$ before the pair, or set $\alpha$, $\beta$ is merged to the verb as a complement. The second problem concerns the LCA. Is it possible to explain that adjuncts must be introduced before the checking of condition C if there is no subsequent movement without the LCA? The third problem concerns the 'island properties' of adjuncts, or rather relative clauses, that pair-merge results in. In Swedish, for instance, relative clauses do not appear to be in a mere 'configuration' and principle (22) does not seem to hold. In the analysis suggested in 6.2 it appears that we can get rid of two of the three problems.

## 6.1 Cyclic derivation

The operation pair-merge seems to be non-cyclic operation by nature. The only difference in Chomsky's approach compared to Epstein et al.'s is that the non-cyclic merge takes place at the same place that the argument is merged. But all relations that apply to the argument must be checked before the adjunct is merged. For the moment there seems to be no way of explaining the binding properties of adjuncts[3] without making use of some kind of later insertion, call it what you may. In the following suggestion I will assume that adjuncts can be late merged. I will also make use of the copy theory of movement.

## 6.2 The proposal

In line with Chomsky (2001) and Epstein et al. (1998) I assume that arguments must be introduced cyclically. I also assume that adjuncts can be late-merged in vP. The adjunct $\alpha$ must be merged to a copy of the element it has a semantic relation to, the argument $\beta$. This means that the relational properties of $\{\alpha, \beta\}$ will be ordinary syntactic relations that must be checked at SEM. Another consequence is that there can be no late-merge to $\beta$ after $\beta$ is spelled out. One crucial difference from Chomsky's (2001) analysis is that there is never such a pair as $<\alpha, \beta>$ only the set $\{\alpha, \beta\}$. I will also follow Chomsky's analysis (2001) that the checking of condition C takes place after TRANSFER in SEM. If we look at the structures of (7) and (8), they will be derived in the following way.

(7) [Which claim [that John was asleep]] was he willing to discuss [Which claim [that John was asleep]].

In (7) the argument [that John made] is merged in the base position and there is a condition C violation because *he* binds *John*. This is similar to Epstein et al.'s and Chomsky's analyses.

(8) [Which claim [that John made]] was he willing to discuss [which claim].

[3] Kayne (2001) has an interesting approach to pronouns, but cannot explain the different binding conditions for arguments and adjuncts illustrated in (7) and (8).

In (8) the adjunct is late merged to [claim] after wh-movement has taken place. The consequence is that *he* does not bind *John* and there is no condition C violation. As I pointed out above the assumption is that the adjunct [that John made] is merged to [claim] in vP. Suppose that there is a strict order in which the different types of merge apply. First external merge applies, second, internal merge applies and third, late-merge applies. It is uncontroversial to assume that external merge takes place before internal merge. If late-merge applies after internal merge or not is perhaps more controversial, but the general approach to late-merge is that it takes place after movement, not before.

In (8) [which claim] is merged to [discuss] by external merge forming VP. *He* is merged to v', forming vP. Then the object [which claim] must be internally merged at the edge of the phrase *discuss*. This is a consequence of the Phrase Impenetrability Condition. If the object is not moved to the edge it will not be able to be raised to spec-CP. The order of move and TRANSFER must necessarily be move-TRANSFER. After [which claim] is internally merged in spec-vP, the adjunct [that John made] is merged to [claim], forming the set {claim, that John made}. Since reconstruction applies in the base position (Chomsky: 2001), there is no copy of the adjunct in that position that can give rise to a condition C violation.

In (19), Epstein et al. suggestion was that the LCA disallows late merge of the adjunct to the argument.

(19) *He$_i$ was willing to discuss the claim [that John$_i$ made].

The analysis that I suggested will make the appeal that Epstein et al do to the LCA superfluous. If condition C is checked at TRANSFER it does not matter if the adjunct [that John made] is merged before or after *he*, because the whole phase is checked at SEM after TRANSFER, including the copy of *he*, which binds *John* in the adjunct. If the assumption that internal merge takes place before late-merge is correct the derivation of (19) proceeds in the following way. [the claim] is externally merged to [discuss]. *He* is externally merged to the structure, forming vP. Then internal merge applies, but since the object [the claim] is not internally merged to spec-vP, there is no internal merge. This leaves the copy in the base position as the only option for late-merge of the adjunct [that John made]. Since [claim] and [that John made] form a set when they are merged the prediction is that we do get a condition C violation, according to facts. This analysis also makes the prediction that a wh-clause *in situ* will give rise to a condition C violation. If the wh-clause is spelled out in its base position there is no copy in spec-vP available for the adjunct. The consequence is that the adjunct must be merged to the antecedent in the base position before TRANSFER. As we can see in (25) this is in conformity with the data.

(25) *He$_i$ was willing to discuss [which claim that John$_i$ made]

In (25) *he* binds *John* and *he* and *John* cannot be interpreted as coreferential, as that would be a violation of condition C.

Since [that John made] and [claim] form a set when they are merged, the operation SIMPL is no longer necessary. If the object and the adjunct form a set and not a pair it might be expected that one or the other may undergo transformations irrespective of the other member of the set. In other words, (22) cannot be maintained. Swedish appears to be such a language where these predictions are born out. In Swedish it is possible to extract elements from a relative clause (see Teleman et al. 1999 for a discussion) as in (26).

(26) Johan$_i$ träffade jag en flicka som älskar $t_i$
Johan$_i$ met I a girl who loves $t_i$

In Chomsky's (2001) analysis there seems to be no way to explain (26). The relative clause [som älskar Johan] must be pair merged in to [en flicka] in VP. This pair is sent to spell-out at vP where the operation SIMPL takes place and forms the set {flicka, som älskar Johan}. But then the object [Johan] in the relative clause is unavailable for the rest of the derivation, due to the Phrase Impenetrability Condition. The effect is that it is impossible to raise [Johan] to spec-CP in the matrix clause.

In the approach I have suggested in this paper (26) gets a straightforward analysis. The relative clause is merged to the object [en flicka]. This operation takes place in the base position, since the object does not undergo internal merge to spec-vP. After late-merge of the relative clause, the object in the relative clause [Johan] can be internally merged in spec-vP for further movement in the matrix clause.

A further argument against pair-merge is the fact that in Swedish a noun can have the definite article without the inflectional ending indicating definiteness if it is followed by a relative clause. When there is no relative clause, the definiteness of the noun must be indicated by means of the inflectional ending, compare (27a) and (27b).

| | | | | |
|---|---|---|---|---|
| (27a) | Jag | köpte | den bok | (som) du rekommenderade |
| | I | bought | the book | (that) you recommended |

| | | | |
|---|---|---|---|
| (27b) | Jag | köpte | boken/ *den bok |
| | I | bought | book+def.art./ *the book |

If we 'extrapose' the relative clause we get (28).

| | | | | | |
|---|---|---|---|---|---|
| (28) | Jag | köpte | den bok | igår | (som) du rekommenderade. |
| | I | bought | the book | yesterday | (that) you recommended |

If Chomsky's (2001) 'afterthought' analysis is applied there are no elements in (29) that can undergo ellipsis. Since the form *den bok* is not well-formed unless it is followed by a relative clause there is no reason to believe that the relative clause is added afterwards as some kind of specification or afterthought.

| | | | | | | |
|---|---|---|---|---|---|---|
| (29) | Jag | köpte | *den bok | igår | (det vill säga) | Den bok (som) du rekommenderade. |
| | I | bought | the book | yesterday | (that is) | the book (that) you recommended. |

## 7 Conclusion

The analysis of binding condition C that has been outlined in the previous section has the advantage over the other analyses presented that it can explain properties of condition C without making use of the LCA and the operation SIMPL. The stipulation is that there is a strict order in which the different types of merge apply in the phase (at least in vP). First elements are externally merged. Then they can be internally merged and finally elements are late-merged. It also appears that internal merge can apply after late-merge. In addition there is no need to stipulate such a relation as a pair. All applications of the operation merge result in sets. Furthermore, there seems to be data that suggest that $\alpha$ and $\beta$ do not necessarily have to be spelled out at the same phase, something that gives additional support to the analysis suggested in this paper.

What this analysis fails to do, just as the other analyses I have presented do, is to explain the data in a syntactic framework that is strictly cyclic. There also remain numerous other areas that have not been dealt with in this paper: scope, binding conditions A and B, to mention only a few. All the approaches to the checking of binding condition C of adjuncts in this paper have more or less taken for granted that relative clauses could be treated as adjuncts. This is by no means a general treatment of relative clauses (see Kayne 1994 and papers in Alexiadou et al. 2000 for different analyses of relative clauses). It will be the aim of future inquiry to find out if the analysis proposed in this paper can deal with other types of adjuncts, such as prepositional phrases and adverbs.

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