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Thesis Title

Subjacency: from *Barriers* to *Phases*

This dissertation is submitted for the degree of

Master of Philosophy

…to my family

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Preface

There have been various sources in the literature (see Boeckx and Grohmann 2004, *inter alia*) arguing that "Phases" (Chomsky 2000a and much related work) virtually restate *Barriers* (Chomsky 1986a). This, I think, reflects a deeper misunderstanding amongst minimalist linguists which is in the atmosphere since the advent of the Minimalist Program (Chomsky 1995). If one attempts to discriminate the most prevalent and productive stages in the modern linguistic theory, they would probably conclude that these stages are two (also Rizzi 2004b): it is the stage of the Theory which reflects the attempts to reach "explanatory adequacy" and that which integrates the attempts to go "beyond explanatory adequacy" (Chomsky 2004a). The former, sets as its goal of inquiry to unearth the human System of Knowledge through the examination of the mechanisms of human Language. Its starting point is that human Language and by implication Knowledge (Chomsky 1995, 2000a/b, 2004a/b) is not an exclusive product of the human interaction with the environment but it bears properties which are originated - genetically endowed - in the human mind / brain. The ultimate goal then for any Linguistic Theory is to both describe the mechanisms and capture the principles behind them, common to any human being, and at the same time account for the various instantiations and choices of the latter which yield the various human Languages.

The second stage - put forward only recently as a field of inquiry - maintains the essence of the former and stretches things one step (or many steps) further. If the previous stage is the one where the Language system was examined from the "inside", in the current one the same system is examined from the "outside". In short, if Language is a biological organ based in the human mind / brain, this organ should

interact with other systems of the human mind / brain, say the system of Thought (conventionally stated; Chomsky 2000a) and systems of the human organism, most possibly the Articulatory and the Perceptual systems. The previous assumptions yield that it would be a possible and an optimally welcome conclusion of the inquiry that the principles behind the mechanisms are not independent properties of the human Language system but are products of or the same general principles that exist in nature, in other biological organisms.

The misunderstanding then lies in the fact that the passing from the first stage to the second brought along theoretical changes (some quite substantial) which are taken to reflect a new Linguistic Theory. Although it is more than correct to assume that the shift in the way things are conceived affects the Theory, the by product of the Minimalist Program, but not the main aim, is the introduction of a new framework. This is because the shift in the program of inquiry does not yield abrupt, chaotic changes. The second stage does not dispense with the theoretical advantages of the first; it builds on them. In this sense the conclusions that derive from the technical comparison of the system of Barriers against the one of Phases may be misleading. In principle, this is because Phases could not restate Barriers even if this was the aim. They reflect converging, but distant, goals of inquiry. Secondly because their technical resemblance is welcome provided that it derives from the general aims of the Minimalist Program; that is, the rethinking of the earlier Theory on a new conceptual basis. Whether, on the other hand, Phases abide by the requirements of the second stage of the theory, namely to integrate principles that independently exist, or not, this is a hard question that the inquiry has to answer.

The present work attempts to examine the explanatory power of the mechanism of phases as far as the phenomenon of Subjacency is concerned. In

Chapters 1 and 2, the system of phases will be pursued and all its theoretical assumptions will be put forward. However, it will be shown that the framework as is currently developed seems to be unable to account for certain phenomena of A'-movement. The conclusions drawn from this discussion will be the starting point of the discussion in the final two Chapters. Following the same line of argumentation, in Chapters 3 and 4 a newly pursued framework will be tentatively proposed, under all the essential reservations. This will yield further refinements of the system of phases.

Chapter 1

0. Introduction

The idea that any linguistic derivation proceeds on a phase-based fashion is introduced for the first time in Chomsky (2000a) and it is further elaborated in his later papers. Especially, Chomsky (2001) and Chomsky (in press) are, by definition, the papers in which the system of phases is mostly investigated and further formulated. However, one could say that seeds of this idea are already introduced in the Minimalist Program (Chomsky 1995: 228). In section 1 of the present Chapter, the currently developed framework[1] concerning the idea of derivations by phase, will be presented. Under this framework two derivations will be examined. In particular, in section 2, movement of the wh-object from finite clauses will be accounted for. It will be argued that the system of phases adequately captures this specific operation. However, the current theory is unable to discriminate intermediate from non-intermediate landing sites of A'-movement in terms of features. Wh-object movement from non-finite clauses will be the topic of section 3, where it will be shown that the current theory not only does not predict but also excludes the specific operation.

1. The framework

Before going into the technicalities of the system of phases, it is necessary, for expository reasons, to briefly refer to the way in which the current minimalist theory

[1] By "current theory" I refer to Chomsky (2000a) and on.

captures the idea of a linguistic derivation. To start with, an important discrimination that the current theory makes is between the *memory* and the *active memory*. The former is an intrinsic part of an I-language (in the sense of Chomsky 1986b). It can be thought as the "hard disk" (in computational terms) of the I-language which stores: a) information of lexical items (in the form of features, drawn from the storage space of features F of the Universal Grammar) and b) a refined C_{HL} (parametrically differentiated from the "prototype" C_{HL} provided by the Universal Grammar). On the other hand, the active memory is the "RAM" (*the workspace*) of the operating system where the C_{HL} uses lexical items to generate *syntactic descriptions* (expressions). It is literally the space where all derivations are supposed to take place. A derivation D presupposes the selection of an array (*lexical array* / LA) of *lexical items* (LI) - which are fully inflected when they enter the LA - by a *one-time* access of the C_{HL} to the *lexicon* (Lex) of the I-language, in question. The *numeration* is responsible for pre-defining how many times a LI will be used in the course of a specific derivation, by employing symbols such as *indices*, which have an expository role without further theoretical properties. Each time a LI is used in the derivation its index is reduced by one. A successful derivation is achieved when all the indices of all the LIs of a LA are reduced to zero and the derivation converges at the interface levels.

The one-time access of the C_{HL} to the Lex is important for two main reasons: a) for reasons of computational economy, since if the C_{HL} accessed the lexicon at any point of a derivation then the former would have the additional burden of carrying along "…this huge beast [the lexicon]" (Chomsky 2000a: 100) and b) for reasons of "self-sufficiency". To be more specific, the latter idea has been captured under the *inclusiveness condition* (Chomsky 2001: 2), which literally means that the role of the C_{HL} is to syntactically rearrange, hence, exhaust all the LIs in a LA, by reducing their

numeration indices to zero without adding any new elements in the derivation apart from the LIs of a LA. Crucially, a derivation converges at the interface levels of the Semantic component and the PF (levels of representation of linguistic expressions) if all the LIs in a LA have been used in the derivation, according to their numeration. It is important to stress the fact that, once a LA has been selected, the derivation proceeds by making shorter computational steps; that is, the initial LA is split into further *lexical sub-arrays* (LsA[2]) which contain LIs selected from the initial LA. The specific LsAs are supposed to be *natural syntactic objects* (SO) which are close to a proposition; that is, "…either a verb phrase in which all θ-roles are assigned or a full clause including tense and force" (Chomsky 2000a: 106). Therefore, a LsA is either a v*P[3] (a transitive predicate which is phi-complete) or a CP. In accordance with Chomsky (in press: 9), the CP is taken to be a shorthand for the region that Rizzi (1997, 2004a) calls "Left Periphery". Hence, a CP may be the projection of a single functional head or it may cover a set of certain functional heads. By implication, after the end of a derivation any information concerning the specific process is erased from the active memory.

Crucially, the mechanism of phases is supposed to operate cyclically in the LsAs of the initial LAs. It is assumed that every LsA is a phase. A phase is either a CP or a v*P (and perhaps a DP; see Svenonius 2003 for further discussion), hence propositional. However, a TP (defective or not) is not considered as phase. In Chomsky (2001, 2004a) there is a further discrimination of phases into strong and weak ones; a vP (unaccusative, passive or raising) is always a weak phase while CP and v*P are the strong ones[4]. The above yield that there is not any notion of syntactic

[2] My convention.
[3] I follow Chomsky's conventions regarding v φ-complete, T_{def}, etc.
[4] I will continue using these assumptions and through the course of the discussion there will be outlined some general properties of this distinction.

derivation independent from any notion of phase. Crucially, when the derivation of a phase is complete the latter is TRANSFERRED to the Spell Out (S/O). After this stage the LIs, which belong to the already transferred phase, are supposed to *freeze*, which means that they do not have the ability to take up further syntactic roles in a later stage of the derivation.

The system of phases turns out to be the strict derivational approach to the generation of the syntactic descriptions. Above all it is the active link between the computational domain of the Faculty of Language (FL) and its representational components, namely the interface levels of the Phonetic Form (PF) and the Semantic component, since it is supposed that the interface levels *run in parallel with* the computation of syntactic descriptions.

Beyond anything, an essential question to ask is why, once a derivational approach to the generation of linguistic expressions is adopted (see for further discussion, Aoun & Li 2003; Lasnik 2001), phases (or something similar to that system) are a necessary computational device in order to account for the way in which derivation proceeds. The reason seems to stem from the following considerations. *Displacement* is an indispensable characteristic of human language (Chomsky *et al* 2002: 92-160; 2004b). Syntactic objects have the intrinsic property of appearing in various positions through the course of a derivation, by leaving their initial positions. This requires that any generative approach to language that attempts to explain the derivation of syntactic objects certainly has to deal with that sort of property. General *locality* matters are then raised, which will reduce to specific considerations of *computational economy* once a computational model is employed to account for the derivation of linguistic expressions. In other words, if we accept that a derivation proceeds on a phase-based fashion we simply assume that operations of the C_{HL} apply

in a strict cyclic, recursive manner to small - better, of certain length - parts of an expression and not to the whole expression at once, since the latter assumption would increase the computational burden of the C_{HL}.

A closer look at the development of the framework of phases leads to the conclusion that the above three factors (locality, displacement and computational economy) have been integrated into the *Phase-Impenetrability Condition* (PIC), which is assumed to a capture the derivation of syntactic descriptions in short, incremental chunks, schematically represented in (1) (Chomsky 2000a, 2001)**:**

1) HP = [α [H YP]]
2) [$_{ZP}$ Z…X…[α [$_{HP}$ H YP]
3) e.g.: [$_{CP}$ C…T…[EA [$_{v*P}$ v* VP]]]

To put things on more concrete footing, in the configuration in (1), take HP to be a phase. Then, α is the *edge* of H, with one or more specifiers selected by the head H. YP is the complement of the head H, namely its *domain*. Then, according to the definition of phases in Chomsky (2000a: 108), the PIC_1[5] predicts that:

4) "In phase α [here, HP] with head H, the domain of H is not accessible to operations outside α; only H and its edge are accessible to such operations."

(4) describes the completion of a phase in the course of a derivation D. What needs to be refined here is the exact time that S/O applies. In particular, as (4) predicts only the complement of H (taken to be the phase-head) is transferred to S/O. H itself and its specifier(s) are available to further computations. To be more specific, say for instance, a SO enters a derivation D as the complement of H, namely YP in 1, and takes part in the computation of the first phase. Suppose that the same object has to

[5] It will be shown that there are two versions of the PIC; hence the choice of the numerical index.

take up an additional syntactic role which will be assigned to it after the completion of the phase in which it is introduced (HP in 1). Then in order for the derivation not to crash, the SO must not be spelled out and hence frozen in place. Then, PIC_1 provides an "escape hatch" to the SO in question, which will move to the edge of that phase. The above yield that (4) derives the notion of strict cyclicity. An explanation is in order here. Notice that under PIC_1 "look-ahead" is avoidable. In simple words, a SO with the previously described properties is allowed to move to the edge of a phase but only if the head of the specific phase allows that kind of movement (to be refined in the following section). Or to put it the other way round, a SO embedded in the complement of a phase-head H will not be extracted out of that complement on the grounds that a following phase-head H_1 (in the sense that H_1 is a phase-head, different from H and any H_n within a derivation) will "attract"[6] it.

Let us take (3) for simplicity and suppose further that there is an initial LA with the relevant LIs that the derivation will use to generate the respective syntactic description. Recall that the theory presented in the present paper is strictly derivational, hence the representation in (3) is for expository purposes only. It is important also to keep in mind the fact that operations within the limits of a phase take place simultaneously and not the way they will be presented, namely one-by-one. The initial LA is split into further LsAs and the derivation begins. If, as is assumed previously (and is taken here at face value) LsAs are supposed to be "natural, propositional syntactic objects" and any derivation which is taken to proceed phase by phase depends on the discrimination of the LsAs of the initial LA, then it should be correct for (3) that the first LsA contains all the necessary LIs for the derivation of v*. Once VP is generated it merges with v* and the EA of v* occupies the Spec-v*

[6] Not to be taken technically here. The operation of movement in current theoretical terms will be analyzed in the following section.

position. We assume the Larsonian type of the verbal domain, with distinct V layers (see for further discussion Larson 1988, and Hale & Keyser 1993). The first LsA is exhausted (all the feature-needs of the LIs are met, uninterpretable features [uF] are valued) and the derivation proceeds[7]. By the time T (the next LsA is introduced) and C merge, the complement of v*, in accordance with PIC_1 is spelled out.

However, as things stand so far, the definition of PIC_1 prohibits T from agreeing with a goal below v* and the problem raised concerns cases observed in the literature as the Icelandic case of the quirky nominative subject, where T is taken to agree with the semantic subject of the clause, which is base generated within the VP-domain. The above problem is overcome in Chomsky (2001: 13-15) with the following condition[8]:

5) "Ph_1 [phase 1] is interpreted / evaluated at the next higher [strong] phase Ph_2."

The crucial point is again the time of the S/O application. Specifically, by (5) the "syntactic life" of a phase is extended to the next higher one. Virtually, the complement of v* is transferred to S/O simultaneously with the merge of C. The syntactic extension of a phase is more than obvious if one compares the configurations in (1) and (2). In (2) ZP is taken to be the next higher strong phase, X a head selected by Z, the strong phase head, and HP the first phase of (1); that is, CP, T, C and v*P in (3), respectively. Then, PIC_1 in (4) has to be restated as in (6) (PIC_2):

[7] For reasons of economy superfluous elements in representations and superfluous steps in derivations are not allowed by the system. See Chomsky (2000a) for relevant discussion. Also notice that uFs remain until the PF component since they are morphologically realized. These issues have initiated important debates in the recent literature (e.g. Legate 2002) and for reasons of space some relevant matters will be taken at face value.

[8] The case of the Icelandic subject provokes further argumentation developed in Chomsky (2001), which will not be pursued further here.

6) "The domain of H is not accessible to operations at ZP: only H and its edge are accessible to such operations."

It becomes obvious then that in such cases as the Icelandic one, the complement of v* is allowed to develop further syntactic relations with elements within the complement of C. This implies that only the complement of C but not C itself can "see" below v* because at the same time the derivation proceeds to the introduction of C the complement of v* is spelled out (enters the interface levels). Recall, as well, that T is not a phase-head. Therefore, T merges with C and only then is the phase spelled out.

The framework above described captures the idea that the operations at the interface levels *run in parallel* with the operations of the C_{HL}. Notice that according to previous theoretical assumptions the operations of the LF[9] and the PF took place after the end of the operations of the C_{HL} (s-structure at that time). What is more, the PIC[10] (better the first half of the PIC, namely the condition that the sister of H is not available for further computations) implies that the C_{HL} along with every level that is involved in the elaboration of an expression (Semantic Component and PF) has to deal with only a small portion of that expression.

The previous discussion yields two important conclusions. To start with, the idea of locality is technically captured under both versions of the PIC; that is, SOs that extend their syntactic life beyond the limits of a phase must do so in a local manner, making "short, local steps" on the edge of every phase. The second conclusion concerns matters which have to do with computational economy. In particular, the operations of the C_{HL}, through the course of a specific derivation D, apply to specific computational domains each time and not to the whole derivation at once.

[9] The reader may have noticed the use of the term "Semantic component" instead of the more familiar LF. The reason is to avoid any implication about covert operations that take place abstractly after the end of the operations of the computational domain of the FL. This is what the traditional LF involves, which is abandoned in the framework of Chomsky (2001).
[10] Both of its versions (4) or (6).

Considerations concerning the notion of the active memory discussed previously, account for the computational economy, as well. The C_{HL} is assigned the task to compute specific derivations within an available working space using certain, given LIs.

For what follows, the framework of phases will be adopted to account for certain phenomena of A'-movement. The following sections of the present Chapter will be devoted to the examination of wh-object movement from finite and non-finite clauses, respectively. In both cases it will be shown that two factors seem to need reformulation in order for the system of phases to adequately capture A'-movement constructions. On the one hand, by putting forward all the current theoretical assumptions, it will be argued that intermediate landing sites of wh-elements cannot be discriminated from non-intermediate (final) ones, in terms of features. On the other hand, it will be shown that unless current ideas concerning the selection properties of C over T change, the wh-object movement from non-finite clauses will not be predicted.

2. Wh-object movement from finite clauses

Let us take a simple case of wh-object movement such as the following:

7) a. what did you think that Mary said?
   b. [$_{CP2}$ what did you [$_{v*P2}$ <what> think [$_{CP1}$ <what> that Mary [$_{v*P1}$ <what> said <what>]]]]?

(7b) represents the base structure of the sentence in (7a). In between the angle brackets, there is each copy of the moved wh-element "what". An explanation is in

order here. One of the theoretical outcomes of the inclusiveness condition (discussed in section 1) is the abandonment of the theory of traces. The reasoning is simple. Recall that once a derivation begins, the C_{HL} cannot further access the lexicon of the FL, hence cannot introduce new elements in the derivation such as traces or indices. Neither are such elements introduced in the derivation by the initial access of the C_{HL} to the derivation (since these devices were never part of the lexicon). The reason is that under minimalist considerations superfluous elements in representations should be eliminated from the two interface levels (see fn. 7). Therefore, traces, indices, bar levels and similar technical devices, employed during the GB period, are taken to be redundant and hence excluded from the lexicon. Furthermore, a crucial point is that a copy is supposed to share identical semantic properties with its moved counterpart, the difference between them being in the phonological content. This is independently predicted by the "No-Tampering Condition" (NTC), according to which Merge of two elements takes place at their edge; that is, a new SO is generated by leaving the two sub-components unchanged. For our purposes here, movement of a SO does not change the initial SO, because of the identical properties of its copy. Notice that this approach revives a previous theoretical assumption, namely the "Copy Theory of Movement", introduced in Chomsky (1955 / 1975).

Another point that should be clarified before proceeding with the derivation in (7) concerns the operations of *Internal Merge* (IM) of a phrase and *Agree*. In simple words, the relationship between a *Probe* and a *Goal* is called Agree. It is supposed that in order for both participants to agree, they must be *active* and a SO is active only when it bears uF(s) (Chomsky 2001). The uFs are valued *in situ*; that is, no movement

takes place, contra previous assumptions. If the Probe has an EF feature[11], IM of the Goal (pied-piping considerations are not accounted for) comes into play, and the Goal moves to the position created by the probing head (specifically, to its Spec). Therefore, if the Probe does not bear any EF the Goal will not move, but the Agree relation will nevertheless be established. Under the above framework, *pure merge* (External Merge, EM) and IM (movement) are taken (Chosmky 2004a) to be *equally costly* (as opposed to Chomsky 2000a, 2001) and *symmetrical*, since they both *come free*. The latter yields that the *duality of semantics* required by the C-I system to be syntactically respected is symmetrically captured in the two operations; that is, "…EM is associated with the Argument structure (base structure) whereas IM with everything else (derived structure)" (Chomsky 2004a: 111 and (in press))[12].

Returning to the derivation of (7) let us see how the first phase, namely v*P, is derived (only the parts of the derivation that are directly relevant to the matter investigated, will be accounted) [13]:

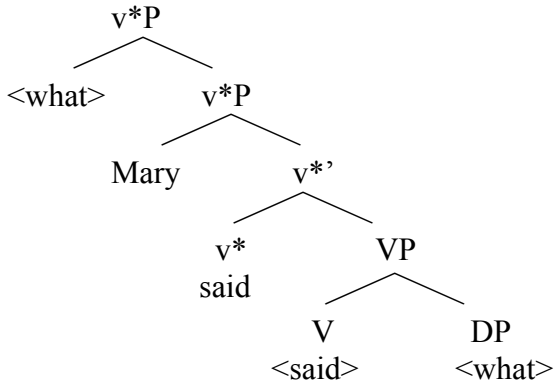

Figure 1

[11] OCC (Occurrence) in Chomsky (2001; 2004a) or EF (Edge Feature) in Chomsky (in press). The development of an independent feature to account for the property of functional categories to allow for extra specifiers (see also Chomsky (in press) for further properties of the EF) is discriminated from the traditional Extended Projection Principle, which requires a subject to be in the Spec-T position. From now on I will adopt the EF convention and I will refer to EPP only with the traditional definition.

[12] EM of expletives is a separate matter. Their exceptional nature stems from the fact that expletives are not arguments and they first merge in a non Th-position (Spec-T). See for discussion Chomsky (in press) and McGinnis & Richards (2004). However, see Richards & Biberauer (2005) who argue that expletives EM in v*P.

[13] For expository reasons I will follow the traditional X'-template. Assume, though, the levels are of the form: $X^{MIN / MAX}$ (see Chomsky 1995: ch. 4).

Figure (1) depicts the first phase in the derivation of the expression in (7). It represents a transitive predicate with all its arguments internally realized; that is, a strong phase. The first LsA is the one containing all the necessary LIs for the C_{HL} to generate that and only that part of the derivation shown in Figure (1).

The wh-element EMs as the complement of V "said" and receives the θ-role of the GOAL[14]. Chomsky (2000a: 108-111) argues that the wh-element enters the derivation having certain feature-properties: along with its interpretable phi-features (Agreement features / ØFs) and an abstract Case Feature (CaseF), it bears an interpretable Question Feature (iQF) and an uninterpretable Wh-Feature (uWhF), as well. The reason for the adoption of the uWhF and the iQF is the following. In accordance with Chomsky, A'-movement is an Indirect Feature Movement (IFM) operation. To put it on a more concrete footing, the phase-head H (in (1)) triggers A'-movement if it bears *P-features* of the peripheral system, namely the Left-Periphery *a la* Rizzi. The idea behind the development of the IFM is twofold. "Look-ahead" has to be avoided while locality considerations require that movement of SOs should take place in "short steps". If we suppose that the features of the peripheral system are Focus, Topic, Force etc., the feature relevant for our purposes here is the QF which is realized on v*. This is due to the fact that the derivation in (7) is a wh-question. Other features are relevant for other constructions.

On the other hand, the argument in favor of the postulation of the uWhF derives from the following economy principle (Chomsky 1995: 294, repeated in Chomky 2001: 34):

8) "α enters the numeration only if it has an effect on output."

[14] According to Figure 1 V moves to v*. it will be taken at face value without further argumentation.

Take α, which is a variable, to be the wh-element in (7). Notice also that, concerning the notion of the *effect*, it is assumed that two elements have the same effect in the output of a derivation D if they are identically interpreted at the interface levels of the phonetic and the semantic component. Crucially, a redundancy like this will never take place in accordance with the economy principle in (8); one of the two elements has to be dropped. Therefore, α is selected only if it changes the phonetic form but by implication retains the semantic interpretation of an element. This is exactly the case of IM and the "copy theory of movement", already discussed. The wh-element in (7) is selected because through the course of the derivation it changes its phonetic form by internally merging in another position and leaves its Semantic realization in its base position unaffected by leaving a copy.

Before continuing with the derivation it is important to clarify the following point. In accordance with Chomsky (in press) the phase-head in a given derivation is responsible for any syntactic operation that takes place. Crucially, C and v* are the phase-heads that bear all the relevant features in order to trigger the appropriate syntactic operations (to be discussed further in the following sections.). Another important point is the fact that any syntactic object in the derivation bears an Edge Feature (EF). The EF ensures that any Merge operation (either internal or external) will take place only to the edge of a SO respecting the NTC; that is, SOs extend any given construction by Merging (either externally or internally) to the edge of the already constructed SO, respecting its internal structure (see also fn. 11).

If the previous assumptions are on the right track, v* should bear specific properties that enable it to trigger wh-IM in its outer Spec. Recall that its inner Spec is occupied by the EA. Notice also that "look-ahead" has to be obviated, as well. In

other words the C_{HL} cannot predict that if the wh-element does not IM in Spec-v* the derivation will crash because there is a peripheral C that must value its uFs. It should be predicted by the system that v* along with its uØFs bears edge properties, as well.

Certain arguments (observed in the literature for independent reasons) provide evidence in favor of the fact that IM of an element in the outer Spec-v* is not only possible but in some cases required. In principle, Alexiadou & Anagnostopoulou (2001) investigating the conditions that define the syntactic behavior of subjects and objects in various languages, show that if in the Theta domain of a clause there is a subject and a direct object (DO), then one of them must vacate that domain. For our purposes here, and in the present framework, the DO can vacate the lower v*P only by adjoining to the outer Spec-v*. Furthermore, Fox (2000) and Legate (2003) argue, providing interesting cases, that the left edge of a vP (either a transitive or a passive) serves as a reconstruction site (see also Svenonius 2003). Keeping in the same line of argumentation, Chomsky (2001) seems to attribute the Object Shift constructions, attested in Icelandic and partially in some Mainland Scandinavian languages, to the edge properties of the v* head, which are reduced to a principle: " v* is assigned an EPP-feature [EF] only if it has an effect on the outcome. " (p. 35). It is obvious that the specific principle stems from the general properties of (8). In particular, concerning v* the effect on the outcome is technically reflected on a feature that justifies IM of a SO in the outer Spec-v*; that is an EF discussed previously[15]. Nevertheless, the adoption of the EF requires that the notion of "syntactic activity" be refined. Chomsky (2005: 19), following ideas from Nevins (2004), argues that "…the EF permits raising to the phase edge without feature matching." Although it is not clear enough, it seems that Agree between a Probe and a Goal can no longer

[15] Chomsky (2004a) assumes further that there is no evidence that the outer Spec-v* is a final position for wh-movement. Nevertheless, Rackowski and Richards (2005) refute this idea based on evidence drawn from Tagalog.

exclusively depend on the postulation of uFs. The EF is not an uF that needs to be valued and deleted. Neither is it a iF[16]. It syntactically reflects an interface requirement that something must appear in the Spec position of the phase-head that has it. It is also supposed that both phase-heads, namely C and v* bear the specific feature.

As matters now stand, the derivation in (7) proceeds as follows. v* merges and agrees with the wh-element. The former values its u∅Fs and the wh-element values its Case. The valuation of the CaseF, which is a uF, is taken to be a parasitic operation on Agree. Consequently, the wh-element IMs in the outer Spec-v* driven by the EF of v*.

The first LsA is exhausted and the second is introduced in the derivation. According to PIC_2[17], the complement of v* is spelled out by the time the embedded C merges:

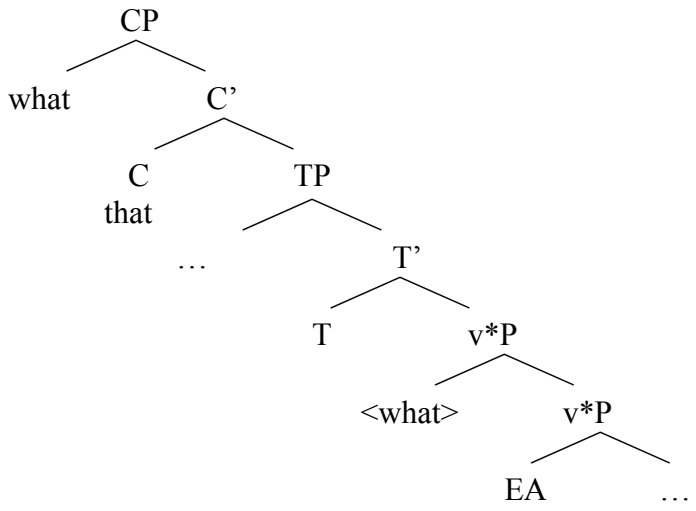

Figure 2

[16] Notice the shift in the argumentation. In Chomsky (2001) "EPP-features" [EFs] are uFs.
[17] The theoretical benefits of PIC_2 which extends the syntactic life of a phase are relevant only in cases of a selected non phase-head (e.g. T) probing below a phase-head (e.g. v*) as is the case of Icelandic already discussed. In the case of wh-object movement, both Goals (the EA of v* and the wh-element) are already on the edge of the phase. Thus, only for reasons of concreteness and since nothing is at stake, I will adopt PIC_2.

In Figure 2 the wh-element is on the edge of v* bearing a iQF and a uWhF. From there it is visible to the embedded C[18] (matrix in Figure 2). In accordance with the IFM Hypothesis, C bears a EF, and uQF. The uQF is the one that activates the Probe C. From this point the derivation proceeds in a similar way as previously. That is, C agrees with the wh-element, the former values its uQF and the wh-element IMs in Spec-C triggered by the EF of C. The second LsA has been exhausted and the phase has been completed. However, as previously the complement will not move to S/O before the next, strong phase-head is introduced, namely v* (lexicalized by the transitive verb "think"). Skipping this part of derivation for reasons of space, since it is the same as in Figure 1, we proceed to the next phase, which is the final one:

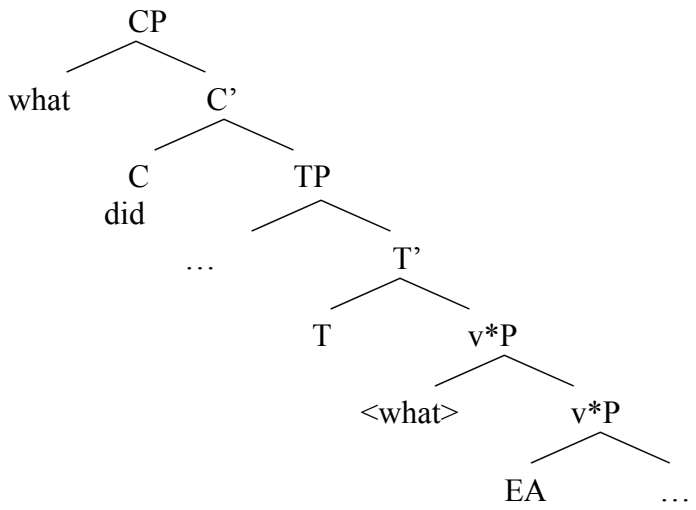

Figure 3

In Figure 3, the wh-element is on the outer Spec of v*, still active having its uWhF unvalued. The next phase is introduced. The important point for the theory is that C, along with the EF and the uQF, bears an iWhF which is able to agree with and

[18] Matters relevant to minimality effect problems between the wh-element and the EA of v* will not concern me in the present paper, since it is argued that, in principle, simple cases of wh-movement are not adequately accounted within the current framework.

deactivate the wh-element by valuing the latter's uWhF. This is supposed to be an intrinsic property of the peripheral C phase-head. Therefore, C agrees with "what", both value their uFs and the latter IMs in Spec-C driven by the EF of C. Then, the final phase of the derivation in (7) is spelled out, since all the LIs in the initial LA have been exhausted.

The problem with the above phase-based approach to wh-object movement is the fact the IFM Hypothesis seems to be a "hidden look-ahead" approach. In particular, there is not any specific argument that should prohibit the intermediate Spec-C position in Figure 2 from not being a final one. The only argument, which crucially recasts the idea of "look-ahead", is the hypothesis that if the final C head does not value its uQF the derivation will crash at the interface levels. One could attempt to obviate the problem by taking the last C that merges in a derivation D to be the final Spec-C position. However, this could not be an answer as the following cases show:

9) What does Bill know that happened ?

10) *What does Bill wonder that happened ?

Case (9) shows that the final C which merges in the derivation is the one that bears the specific feature to deactivate the wh-element "what". However, case (10) shows exactly the opposite. In particular, the embedded Spec-C in (10) is the only final position. We have to assume then that the embedded C bears all the relevant features for the deactivation of the wh-element, as well. Obviously, the selection properties of V directly affect the properties of the intermediate C.

To sum up and conclude, in the present section we approached the wh-object movement from the perspective of the system of phases. At the same time, there were

presented all the current theoretical arguments to justify on a theoretical and technical basis that kind of syntactic operation. In particular, the EF on v* is justified by the latter's edge properties. The uQF on C, the uWhF and the iQF on the wh-element are taken to be a rational outcome of the IFM Hypothesis. Nevertheless, the current theory fails to adequately discriminate the final Spec-C positions, namely the landing sites of the wh-movement from the intermediate ones, the positions that serve as a "gateway" (in Rizzi's (in press) terms) to movement. It is finally implied, through the special nature of the EF that the activity condition cannot and should not be a total condition on derivations. That is, derivations should not rely only on the existence of uFs as is currently thought. This is an assumption with serious theoretical implications since in current theoretical terms syntactic operations are feature-driven operations imposed by the interface levels for reasons of economy (see also fn. 7). In the following section, through the examination of wh-object movement form non-finite clauses, current ideas concerning the selection properties of C over T will be examined and refuted. Pending the discussion in Chapter 3, the derivational power of C over T will be generalized.

3. Wh-object movement from non-finite clauses

Chomsky (2000a: 102), discussing the various syntactic combinations of the Core Functional Categories (CFC), namely v, C and T[19] , argues that T is selected by V only when the former heads the tense domain of a non-finite clause. In particular, C, a strong phase head, selects T and in that case the latter is phi-complete, in the sense

[19] The status of T as being either a CFC or a substantial category or a CFC with specific properties is a controversial issue. However, I will take its functional status at face value.

that it is a finite clause with all the ØFs and Tense feature present. On the other hand, T can be selected by V as well and in that case we have a non-finite clause. This idea has survived in his most recent writings on the matter, as well (see Chomsky (2004a) & (in press)). Specifically, Chomsky (in press) adopts an even stronger approach to the above by arguing that since the strong phase-heads are the only Probes in a given derivation and the ØFs are the ones that make a head probe for a specific Goal (a DP in our case), then T cannot independently own the ØFs. In this case it should be assumed that T is either a phase-head (not preferable) or it is an exception (not preferable, as well). Therefore, to avoid the previous possible conclusions, it is supposed that T inherits its ØFs from C and the former is in the lexicon having only morphological and phonological properties but not attraction properties of its own. The crucial cases are the following:

11) a. there is likely to be a proof discovered
    b. there is [$_{A}$ likely [$_{TP}$<there> to be a proof discovered]]

12) a. it is likely that a proof will be discovered
    b. it is [$_{A}$ likely [$_{CP}$ that [$_{TP}$ a proof will be discovered]]

Phase derivation and technical matters aside, in (11) it is supposed that the embedded infinitive T is selected by the matrix A. Crucially, there is not any intervention by C as the base structure in (11b) shows. The expletive "there" EMs in Spec-T of the embedded clause and IMs in Spec-T of the matrix one. On the other hand, in (12) as the presence of "that" reveals, the embedded T is selected by C and this is the reason why the former heads a finite clausal domain. Discussing the various syntactic relations that the CFCs are allowed to develop within a converging derivation,

Chomsky (in press) points out "…an asymmetry between C-T and v*-V. T can appear without C, but V requires v*", (p. 14).

However, there is strong evidence that raises serious doubts for the conclusions concerning the relation between C and T. Specifically, cases of wh-object movement from non-finite clauses raise doubts about the hypothesis that non-finite T is selected by V and not C. Notice that in Chomsky (2000a and (in press)) the exceptional nature of these constructions is not made clear. Let us take the following examples and analyze them according to the framework developed so far:

13) a. John wonders what to do
b. John [$_{V}$ wonders [what [$_{TP}$ to [$_{v*P}$ <what> do <what>]]]

(13) is a case of wh-object movement from an non-finite clause. According to the base structure (13b), the wh-element, which is the DO of the lower V "do", agrees with v* on the basis of the uFs (recall the discussion in the previous section), and "what" IMs in Spec-v* triggered by the EF of v*. The first phase has been completed but in accordance with the PIC_2 and (5) the complement of v* cannot be spelled out before the introduction of the next higher strong phase. The relevant structure is shown in Figure 4:

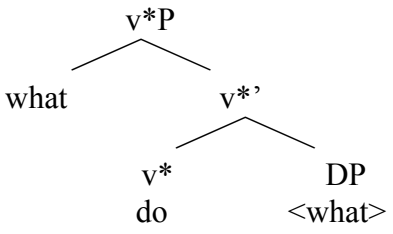

Figure 4

Suppose then that the next LsA, containing the matrix v*P is introduced in the derivation. At the same time the complement of the lower v* is transferred to S/O.

The heads that merge are V, T and v*. Recall that operations within phases take place simultaneously, hence the heads merge the same time:

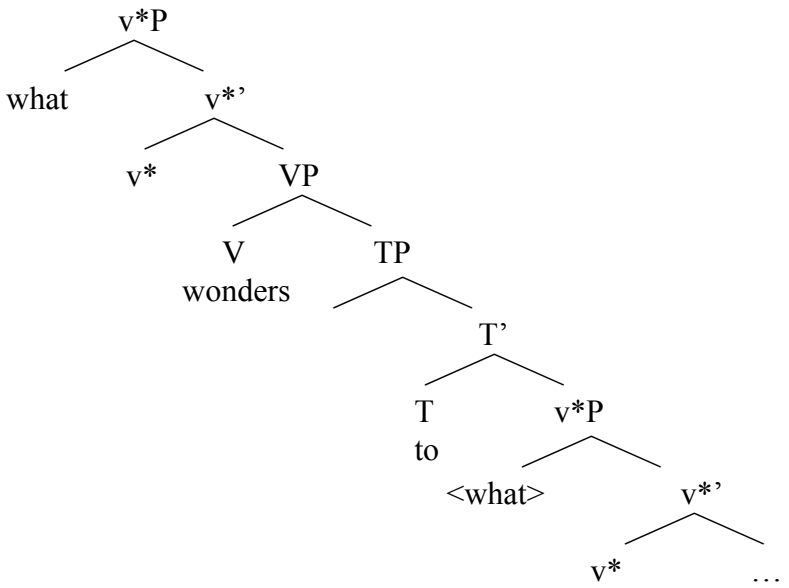

Figure 5

Figure 5 abides by Chomsky's (in press) assumptions that a non-finite T is selected by V and not C. If the c-commanding v* ("wonder") agrees with the wh-element which has IM in the lower Spec-v*, then the wh-element should IM in the matrix, outer Spec-v* position, driven by the EF of the c-commanding v*. Recall that TP is not a phase, hence v* can search for a possible Goal below T. Furthermore, notice in Figure 5 that the crucial landing site for "what" is a Spec position in between V and T. Under the current framework as discussed previously there is not any available position to host the wh-element. By implication then, (13) should be ungrammatical contrary to evidence.

To sum up and conclude, it has been shown that the derivation of wh-object movement from non-finite clauses raises doubts about the current idea that T is selected by V when the former heads a non-finite clause. An obvious conclusion is that the position which hosts the wh-element in (13) is Spec-C. Pending the discussion

in Chapter 3, a possible and optimal assumption would be to assume, along the lines of Kayne (1984), that a non-finite T is always selected by C. This would further require the re-examination of ECM constructions with respect to the framework of phases.

4. Conclusions

The preceding discussion raised two important points concerning the derivation of wh-objects from finite and non-finite clauses, respectively. In order for the system of phases to adequately capture the former derivation, the adoption of the specific Fs seems to require re-examination. On the other hand, certain theoretical assumptions concerning the selection properties of C over T and possible asymmetries between strong phase-heads seem to be insufficient to predict cases of wh-object movement from non-finite clauses.

In the same line of argumentation, the derivation of the wh-subject along with the most current theoretical assumptions on the matter (Chomsky (in press)) will be discussed in the following Chapter.

Chapter 2

0. Introduction

The present Chapter will be devoted to the examination of wh-subject extraction from finite and embedded "that-clauses" even though the present work attempts to focus on phenomena of Subjacency and not on phenomena that fall under the theoretical assumptions of the "Empty Category Principle (ECP)". On the one hand, current ideas (Chomsky (in press)) will be discussed and crucial theoretical changes will be highlighted. Nevertheless, it will be shown that both a complex wh-object and a complex wh-subject bear the same structure and so Chomsky's proposed asymmetry between them does not seem to be on the right track. On the other hand, the case of wh-subject extraction from "that-clauses" will be discussed and it will be shown that current theoretical assumptions seem to be unable to capture the ungrammaticality of the operation in question.

1. Wh-subject movement from finite clauses

Chomsky (in press) develops a rather strong approach to the derivational power of the system of phases. To repeat the main idea for convenience, he assumes that the strong phase-heads, namely v* and C (C as one functional head or the set of the functional heads of the Left Periphery), are the only Probes within a derivation D. Focusing on the discourse domain and on wh-question constructions, C bears all the relevant features plus the features of subject Agreement. This implies that T, being in the

lexicon without the ØFs, inherits them from C and in this case, when selected by C, it heads a finite clause. Let us take the following example[20], with the base structure (14b) and the respective derivation as represented in Figure 6:

14) a. Who arrived?
b. C…T…[$_v$ arrived who]?

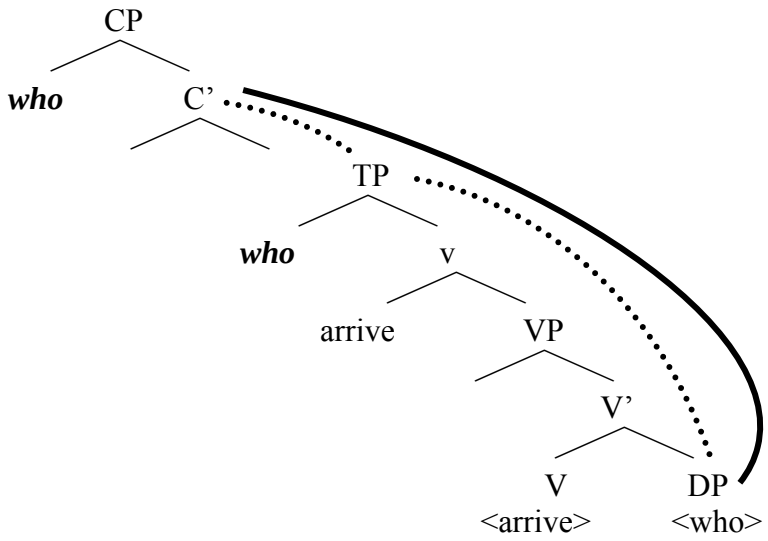

Figure 6

An explanation is in order here. Recall that vP is not a phase. Once vP is completed, its complement is not spelled out even after the merge of C; that is, since v is a weak phase-head PIC_2 is not activated. Notice that v is generally supposed to lack Accusative Case and External θ-role. For the derivation in Figure 6, I will abide by what is tacitly assumed in the current literature and take v to merge first in its own LsA. Crucially, when C and T merge two operations take place. On the one hand, T inherits the ØFs from C (upper half of the dotted line in Figure 6). Consequently C (via T) agrees with "who" and the latter IMs in Spec-T to satisfy EPP (lower half of the dotted line). This operation creates an A-chain plus the already constructed one

[20] Most of the examples discussed in the present section are taken from Chomsky (in press).

(the base generated "who"; notice that chains can have only one member). That is, "Spec-T…<who>" and "who" respectively. On the other hand, C agrees directly with the wh-element on the basis of their respective uFs and the latter IMs in Spec-C attracted by the EF of C (the continuous line). This operation, in turn, creates an A'-chain, namely "Spec-C…<who>". This yields that the discrimination between A and A' chains as pursued in Chomsky (in press) deviates to a certain degree from the traditional one. To be more specific, chains are discriminated on the basis of the way they are derived. Hence, an A'-chain is created by the EF of a phase head; that is, between a SO which is in Spec-C and outer Spec-v* and its copy in its base position. Crucially, no matter what the intermediate landing sites are, an A'-chain retains its properties[21]. All the others are A-chains.

Let us examine how cases of the subject condition fall within the previously developed framework. To start with, in accordance with Chomsky's recent approach, contrary to what has been taken for granted so far, it is the base structure of the derivation of the subject that predefines its island-hood and not its surface position:

15) a. of which car did they find the driver?
    b. C…T…[$_{v*}$ they found the driver of which car]?

16) a.* of which car did the driver cause a scandal?
    b. C…T…[$_{v*}$ the driver of which car caused a scandal]?

17) a. of which car was the driver found?
    b. C…T…[$_{v}$ was found the driver of which car]

[21] The shift in the approach to chains introduces numerous theoretical changes. For instance, it is obvious that "improper movement" (A -A'-A) is directly affected. Notice that intermediate positions do not change the final status of a chain, since it is assumed that the final status of a chain is defined by the landing site of its head, not of its copies. For a discussion on this kind of movement and interesting theoretical assumptions (though from the representational point of view) see Williams (2003). Nevins (2004) offers a derivational approach to the matter.

(15) is a transitive predicate, with the wh-element being the PP complement of the DP "the driver". The whole DP is the DO of the verb "find". (16) is a transitive predicate, as well. The wh-element has the same status, though the whole DP is base generated as the EA of the predicate. (17) is a passive predicate with the wh-element having the same structure as the previous constructions. The question here - which is what constitutes the subject condition - is why in case (16) movement of the wh-element leads to ungrammaticality as opposed to examples (15) and (17).

The derivation of the example in (15) proceeds as follows: the wh-element is base generated within the DO of the transitive predicate. v* agrees with the wh-element, both value their uFs and the wh-element probed by the EF of v* IMs in the outer Spec-v* (recall that the inner Spec-v* is already occupied by its EA). The first A'-chain is created, specifically "outer Spec-v*…<of which>". The first phase of the derivation is completed. In accordance with PIC_2 the complement of v* is not spelled out before the whole phase is evaluated in the next, strong phase. Consequently, C and T merge. The complement of v* is spelled out, as soon as C merges. T inherits the relevant ØFs from C and values them against the EA of the predicate (recall that the ØFs of the EA are interpretable). Then, the EA IMs in Spec-T creating the second A-chain, namely "Spec-T…inner Spec-v*" (the first one contains the EA). After this the complement of v* becomes opaque to further operations. C in turn, agrees with the wh-element and the latter IMs in Spec-C, driven by the EF of C. This creates the second A'-chain; that is, "Spec-C…outer Spec-v*".

Moving on to the derivation of the example in (17), the situation here is to some extent similar to (14). v is not a strong phase-head since it is a passive predicate (similar to unaccusative and raising predicates). Therefore, the complement of such a predicate is an available Goal for the probing properties of any c-commanding strong

phase-head. To put it more technically here, the DP "the driver of which car" does not value its Case against v because the latter not being a strong phase-head cannot trigger any complete syntactic operation, such as Agree. Therefore the DP is "visible" when C merges. According to the hypothesis on visibility as pursued in Chomsky (in press: 16):

18) "an A-chain becomes invisible to further computations when its uninterpretable features are valued."

Recall that chains can consist of only one member. Nevertheless, as is shown in (14), there is not any relation between the Spec-T and the Spec-C positions; that is, the wh-element does not IM in Spec-C extracted from Spec-T (we will return to this shortly). Furthermore, if C agrees (via T) with the DP (in which there is the wh-element) in its base position, the DP will value its uF (Case). Therefore, according to (18) the DP will be a head of an A-chain with all its uFs valued and hence, invisible to further computations. On the other hand, raising cannot take place before Agree because the uFs of the DP will not be valued and the derivation will crash. It follows that the two derivations must take place *in parallel*. While C moves the DP to Spec-T, it extracts the wh-element and moves it to Spec-C. As a consequence, in (17) there are two A-chains and one A'-chain. The A'-chain is "Spec-C…<of which car>" and the A-chains are "the driver of which car" and "Spec-T…<the driver>.

The derivation of (16) is a bit more different than the two just described (15 & 17). In (16) the DP is already in Spec-v* as the EA of v*. Being there, though, the DP is not in the *minimal search domain* of the phase-head v*, namely its c-command

domain[22]. Therefore, v* does not play any further role in the computation of its EA. One could argue that there is not any real necessity for v* to be the probing phase-head, because according to PIC_2 v* and its edge (EA and additional Specs) are prone to the probing properties of the c-commanding phase-head, namely C. Furthermore, Chomsky assumes that although the EA is visible to C, the wh-element is not; if it was, then the subject island condition would be obviated. To quote from him "…*which* [in 16] is embedded in the lower phase, which has already been passed in the derivation." We will return to this shortly. On the other hand, it is further proposed that the EF of T is impenetrable to C, in order to account for the fact that C cannot extract the wh-element if the DP is in Spec-T position. This argument is independently supported by (18). Say, for instance that the whole DP IMs in Spec-T. This means that it will constitute an A-chain "Spec-T…<the driver of which car>" the head of which, namely Spec-T, in accordance with (18), will become invisible to further computations. It follows then that the derivation crashes at the interface levels because uFs from both sides are not valued; that is, uQF on C and uWhF on the wh-element.

Nevertheless, it is worthwhile to clarify the circumstances (implied by Chomsky (in press)) under which the wh-element embedded in the EA of v* is not extractable by the matrix C. The respective structure is the following:

[22] The relation of m-command is not available in the current theory.

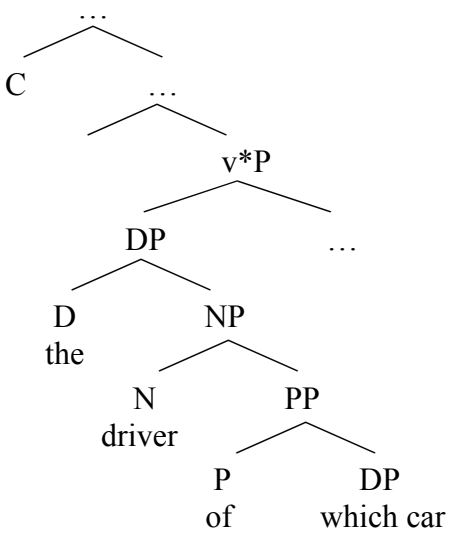

Figure 7

Shown in Figure 7, the wh-element is primarily selected by P and PP is the complement of the N "driver". The whole NP is then selected by D which constitutes the matrix DP. In accordance with Chomsky (in press) C cannot agree and extract the wh-element because the latter is embedded in a phase which has already been passed to S/O. Although it is not made explicit by Chomsky, as the structure in Figure 7 reveals, there are two heads that could be accounted as phase-heads (abstracting away from the discrimination: "strong versus weak"). The first one might be P which selects the DP complement "which car" and the second the matrix D which selects the PP complement, in which the DP "of which car" is embedded. Suppose that the phase that Chomsky implies is the matrix DP the derivation should be the following (I simplify it for expository reasons). The wh-element bears an abstract CaseF, a uWhF and a iQF. P merges, agrees with the wh-element and the latter values its Case. However, we assume that PP is not a phase[23], thus the complement of P is not

[23] Although I will not refer to the case of P being the phase-head, notice that if the Case-feature of the wh-element is valued against P, then in line with Chomsky (in press), it should be correct that P is a phase-head, since only strong phase-heads are responsible for computations during a derivation. It is worth mentioning that there are various approaches on the matter; see e.g. Kayne's (2004) observations

transferred to S/O even after the merge of the matrix D. In other words PIC_2 is respected. The matrix D merges and values all the relevant uFs. Nevertheless, it should be supposed here, contra previous assumptions, that D does not bear any EF to trigger the wh-element to its Spec. In this case, once C merges, even under the extended PIC_2 will not agree with the wh-element because the latter will be spelled out as soon as the operations relevant with T are completed. Crucially and without engaging myself to further argumentation, since it would lead us too far afield, current evidence supports this approach. It has been independently shown (see Svenonius 2003 & Matushansky 2004) that there are serious doubts as to whether D bears edge properties similar to the ones concerning v* and v (discussed in Ch. 1, section 2).

If the previous remarks are on the right track, a point that seems to require further investigation is the fact that in (15) v*, which bears the same phase-properties as C in (16), is allowed to "penetrate" the DP violating PIC_2, agree with the wh-element below D and extract the latter to its edge (outer Spec-v*). On the other hand, as was shown previously, C in (16) is not allowed to follow the same line of derivation. Under these considerations, the difference between the two derivations (and more widely seen, a subject / object asymmetry) does not seem to be, contra Chomsky, the fact that in (16) the wh-element is more deeply embedded than the respective element in (15). That is, all things been equal, the derivation in Figure 7, which represents the matrix C probing the wh-element which is embedded in the complex DP, is identical to the one in Figure 8, where the wh-element embedded in the complex DP is being probed by v*:

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as regards the Italian and French prepositions or Muller's (2003) assumptions that all phrases are phases.

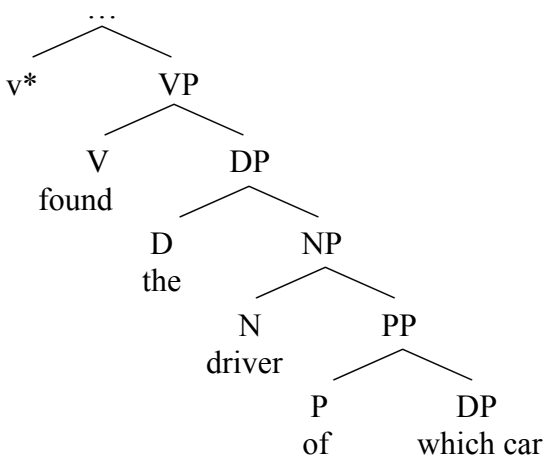

Figure 8

A possibility could be to assume (p.c. Ian Roberts) that the definition of the "edge" in PIC can account for the attested asymmetry between the probing properties of C and v*; that is, only the label and not the internal structure of the SO is visible to C, as opposed to v*, once this SO is on the edge of v*. Nevertheless, such an approach would fail to predict the grammaticality of the echo-counterpart of (16): "the driver of which car caused a scandal" (see also the discussion in Ch. 4 and fn. 38).

To sum up and conclude, in accordance with the most recent approach on the matter, movement of the subject takes place from its base position and not from its surface one. The idea which is pursued generalizes the derivational power of strong phase-heads, such as C, within a given derivation and minimizes the properties of the selected non phase-heads, such as T. Nevertheless, it is shown that the alleged asymmetry between the subject and object extraction does not seem to stand on firm grounds; that is, in both circumstances the derivation of the wh-element bears the same structural properties. In other words, the argument that in the case of the subject the wh-element is embedded to a phase which is passed to S/O and this is the reason why C cannot probe it, does not seem correct since in the case of the object the wh-element bears the same structure but v* is able to probe it (compare Figure 7 with

Figure 8). In the following section wh-subject extraction from "that-clauses will be examined under current theoretical assumptions.

2. Wh-subject extraction from embedded "that-clauses"

One of the most well studied cases in the literature (for relevant discussion and argumentation see Chomsky 1986a, Lasnik & Saito 1984) of subject movement is wh-subject extraction from embedded clauses headed by an overtly realized C:

19) a. *who do you think that got the promotion?
b. [*who do you think [$_{CP}$ <who> that [$_{TP}$ <who> got the promotion]]]
c. who do you think got the promotion?

(19a) is an ungrammatical case in Standard English (SE). In the pre-Minimalism era the ungrammaticality of this case was attributed to the fact that wh-subject extraction cannot take place once the embedded C is phonetically realized. This is clearly shown from its grammatical counterpart in (19c). Within the framework employed during that stage of the theory (see Roussou 2002, for a very coherent introduction to the matter), it was assumed that extraction of the subject from Spec-T would leave a "trace" bearing specific properties. Under certain argumentation, base positions of SOs should be represented at the interface levels and "traces" were employed to identify these base positions. Hence, the relation between moved SOs and "traces" should be "visible" at the interface levels. Certain principles and conditions secured this visibility. If these principles and conditions were violated, "traces" could not be identified at the interface levels and the derivation would crash. This is, in brief, the

case in (19a). EM of "that" was assumed to block the relation between the moved wh-element and its "trace" which is in Spec-T. Hence, at the interface levels this relation could not be available and the "trace" was not identified. This yielded the failure of the derivation.

In current minimalist terms, however, the theoretical assumptions which stem from the "Trace Theory" cannot be articulated or sustained within the framework of the "Copy Theory of Movement". The reason (recall also the discussion in Ch. 1, section 2) is that copies of moved SOs do not require specific identification at the interface levels for they bear no additional theoretical properties. In simple words, this yields that the ungrammaticality of (19a) cannot and should not be attributed to reasons having to do with the copy of "who" in Spec-T. Nevertheless, even under certain current conceptions concerning the derivation of the subject, discussed in the previous section, in connection with the analysis of intermediate Spec-C positions pursued in Ch. 1 section 2, the ungrammaticality in (19a) seems not to be adequately accounted for. Let us follow the relevant steps of the derivation:

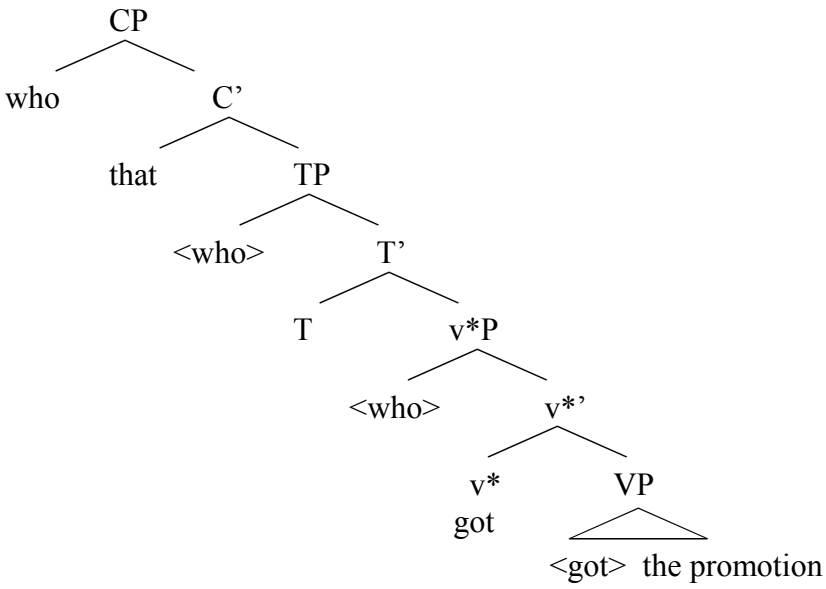

Figure 9

Figure 9 depicts the first two phases of the derivation. Focusing only on the parts of the derivation in question, the embedded C in (19a), (matrix in Figure 9), bears three features, namely a EF, a uQF and the relevant ØFs. Crucially, when C is an intermediate position, as is shown in Figure 2 and in accordance with the IFM Hypothesis, the features that it bears do not seem to block EM of "that". In particular, it is well known that only C with a iQF, namely a final C head triggering IM of a wh-element, seems to be in complementary distribution with the EM of an overt "that" since the latter carries the properties of a declarative C whereas the former bears the properties of a Question clause (example 7, repeated as 20, 21):

20) what (*that) did you think Mary said?

21) What did you think (that) Mary said?

In (20) the matrix C is a final position bearing all the essential features to agree with and deactivate the wh-element in Spec-C. As it is obvious from the ungrammaticality of the choice of "that" in the parentheses, the two features which are being carried by a final C and a declarative C, respectively contradict with each other. On the other hand, what (21) shows is the fact that PF realization of the declarative "that" does not prohibit the intermediate C from bearing a uQF, agreeing with the wh-object and attracting the latter in its Spec. Otherwise (21) should be ungrammatical because "what" could not pass through the intermediate Spec-C.

With this as an essential background, the derivation in Figure 9 should continue as follows. The wh-element in Spec-v* bears a uWhF and a iQF. C transmits its ØFs to T. T in turn agrees with the EA of v*, both value their uFs (abstract Case

for the wh-element) and the latter IMs in Spec-T to satisfy the EF of T. On the other hand, C agrees with the wh-element in Spec-v*. Recall here that, as it is mentioned in the previous section, C cannot directly agree with and extract the wh-element from Spec-T whereas extraction of the whole EA from Spec-v* is licit as opposed to extraction from something inside the EA. Therefore, both C and the wh-element value their uFs and the latter IMs in Spec-C due to the EF of C. The rest of the derivation follows as is already described in other domains. The matrix C values its uQF, the wh-element values its uWhF and the latter IMs in Spec-C to satisfy the EF of C. Nevertheless, the derivation in accordance with (19a) somehow crashes at the interface levels. It is obvious then that current considerations concerning the derivation of the subject of transitive clauses fail to capture the illicit movement of the wh-subject from embedded "that-clauses".

To sum up and conclude, in the present section the case of subject extraction from embedded "that-clauses" is examined by employing the current theoretical assumptions, already discussed in previous sections. It is shown that within this framework the ungrammaticality of such an operation cannot be directly captured. It is further pointed out that the theoretical considerations of an earlier stage of the theory that accounted for the illicit movement in (19a) cannot be sustained on current grounds.

3. Conclusions

Two conclusions seem to be the crucial ones. As opposed to the current hypothesis, it is argued that the resistance of subject extraction does not seem to depend on the

latter's base position. The second conclusion concerns the subject extraction from embedded "that-clauses". It is shown that the ungrammaticality of such cases does not seem to be predicted by the currently adopted framework.

The attempt to give an answer to the above outlined points will be the goal of the following two Chapters. The approach which will be pursued, employs and adapts a number of assumptions, all of which, either by implication or not, are being adopted by the current literature in other domains. Nevertheless, due to the tentative character of the approach, the alleged generalizations will be put forward with the necessary reservations.

Chapter 3

0. Introduction

In the present Chapter, a number of syntactic phenomena of A'-movement will be analyzed from a relatively novel point of view and an additional framework will be integrated into the system of phases. The necessary changes, which will be pursued, will abide by the requirements raised once explanatory adequacy is set as the guideline of an inquiry. Nevertheless, I would like to stress the tentative character of the proposed approach. Although new considerations will be pursued in the form of generalizations, it will not be implied that this is the outcome of further parallel inquiry in other domains, so as the alleged generalizations can meet independent support. The novel nature of the approach to be proposed lies in the combination of converging ideas that have been put forward in the recent literature and have been supported by various sources. The main idea to be presented is twofold. On the one hand, as has been independently supported in the recent literature (see *inter alia*, Legate 2002, Manzini and Savoia 2002, Roberts and Roussou 2002, Roussou 2002, Nevins 2004, Chomsky (2005), Rizzi (in press)) syntactic operations do not necessarily rely on uninterpretable features. The same line of argumentation will be kept and additional assumptions will be pursued. It will be argued that as far as the derivation of wh-questions is concerned, all of the features are interpretable at the interface levels. Under this approach, Agree will not be a "feature-valuation" operation but a "feature-matching" one. Since the assumptions about the existence of uFs will be dropped, it will be proposed that the intrinsic properties of interpretable

features justify the derivation of syntactic descriptions. Furthermore, it will be assumed that the driving force for derivations is the principle of "Maximize Matching Effects" (MME) introduced in Chomsky (2001). Once this principle is satisfied, on the basis of the agreement relation between a Probe and a Goal, the derivation "freezes". On the other hand, Chomsky's approach to the derivational power of strong phase-heads will be generalized and certain properties will be highlighted.

The conclusions which will derive from the presently pursued approach will be the following. In general, as far as the construction of wh-questions is concerned, the strong phase-heads comply with certain instructions of the interface components reflected in their feature-specification. In the present Chapter, wh-object movement from finite and non-finite clauses will be re-examined in accordance with the proposed framework. In the latter case, a symmetry between strong phase-heads will emerge. That is, C and v*, under specific syntactic environments, become weak phases. The discussion in Chapter 4, concerning the wh-subject constructions, will reveal that behind the subject / object asymmetry, there is a symmetry; it will be proposed that the same principle defines the derivational power of the strong phase-heads in both operations. What is more, it will be argued that the same principle can account for the symmetry between the derivation of the wh-object and the passive predicate. What is more, in the same line of argumentation the ungrammaticality of wh-subject extraction from "that-clauses" will be accounted. Finally, a possible parameterization between "pro-drop" (such as Modern Greek) and "non pro-drop" (such as Standard English) languages, based on different properties which characterize the strong phase-heads, will be put forward.

1. The framework

In Ch. 1, sections 1 and 2, it was argued that uFs are the ones that are responsible for syntactic operations within a specific derivation. It is generally assumed that uFs enter the derivation unvalued and must not be spelled out before they are valued by the respective iFs due to reasons of economy already discussed (see also fn. 7). The iFs which also enter the derivation are supposed to be interpretable at the interface levels. Furthermore, according to the "activity condition" (Chomsky 2001) SOs can take part in computations within a derivation provided that they carry uFs. These are the relevant features that render a SO active through the course of a derivation. This means that an agreement relation is established between a Probe and a Goal, once both SOs are active. Agree is a relation based on "feature-valuation" which takes place "at a distance", meaning that the involved parts value their uFs "in situ". Similarly, provided that the Probe, which is a strong phase-head, carries an EF, the Goal, which is a LI, IMs in the former's Spec.

The above describe, by and large, the current assumptions concerning the nature and the motivation for the relation which is developed between SOs during a particular derivation. Nevertheless, independent sources in the literature have raised doubts both about the validity of the "activity condition" and the status of Fs in general. To put it on a more concrete footing, Nevins (2004), argues that the "activity condition" not only fails to account for certain cases (e.g. the phenomenon of non-nominative subjects) but also rules out grammatical cases of A-movement such as IM of a structurally case marked DP to satisfy EPP. He further proposes that the theoretical advantages of the "activity condition" can be subsumed by already independently proposed principles. What is more, Legate (2002) goes through certain

matters that are raised in Chomsky (2001), and by adopting arguments from the field of Semantics, she questions the reliability of the criteria on which the identification of iFs is based. She further concludes by proposing a system of feature discrimination based on morpho-syntactic and semantic criteria. Roberts and Roussou (2002), on the other hand, attempt to unify T-to-C movement in VSO languages with the EPP and take as a prerequisite that all Fs are LF interpreted and that there are not uFs (in the sense of Chomsky 1995). Similarly, Roussou (2002), under her approach to syntactic derivations, proposes that "…there is no need to assume the presence of uFs as triggers for Agree. It is possible to take Agr as an interpretable head." (p. 19, fn. 3). Manzini & Savoia (2002), discussing the null-subject parameter in pro-drop languages within a framework similar to Manzini & Roussou (2000) and Roussou (2002), do not resort to uFs as a prerequisite for syntactic derivations. In the same line of argumentation, as it is already pointed out in previous Chapters of the present paper, Chomsky (2005) assumes that although the EF of a Probe is responsible for the Goal's IM in the former's Spec, there are special properties of the EF that render it interpretable at the interface levels. The point to be stressed concerns the intuition behind the adoption of the EF. Chomsky (in press) assumes that it is a feature which carries certain properties of the interface levels and these properties should be respected by the C_{HL} through the course of a derivation. Last but not least, Rizzi (in press) approaching the wh-movement constructions from a representational point of view, argues that the features which trigger A'-movement (and define the intermediate positions of such constructions) are "functional" counterparts of the "substantial" features that finalize the operation (and define the final positions of wh-elements). The latter are supposed to be iFs whereas the former uFs. The point relevant for our discussion is that Rizzi argues that there is a substantial iQF on C

which once met by the wh-element, the latter "freezes" there, namely in Spec-C. The previous considerations lead to two basic conclusions. Firstly, it is possible to dispense with the assumption that uFs are the motivation for syntactic derivations. Secondly, once this happens any new proposal should be ready to account for the driving force of syntactic derivations. In other words, if all features are interpretable at the interface levels, a problem arises concerning the motivation for the agreement between a Probe and a Goal. Similarly, if uFs do not exist then any proposed approach should account also for derivations that crash at the interface levels.

Keeping in a similar line of the argumentation, in what follows it will be assumed that all features are interpretable at the interface levels. In this sense features are supposed to carry specific information from the interface levels to the C_{HL} (similar to the information carried by the EF). This information is in the form of instructions that must be operationally respected by the C_{HL}. The argument behind this stems from the following considerations. Chomsky (2000a) assumes that the principles and mechanisms of the computational component reflect the "needs" of the interface levels. In other words, the C_{HL} carries out operations which are taken to abide by specific conditions and principles imposed by the interface levels. That is why "…progress in understanding them [i.e. the interface components] goes hand in hand with progress in discovering the language systems [i.e. the conditions set to the C_{HL}] that interact with them. So the task is simultaneously to set the conditions of the problem and to try to satisfy them, with the conditions changing as we learn more about how to do so." (p. 98). Similarly, it will be assumed that, along with principles and conditions, specific instructions of the interface levels are taken to be reflected in the form of iFs. A Probe and a Goal, then, Agree on the basis of certain features that carry specific instructions from the interface levels. A convergent derivation is a

derivation in which all the information carried by these Fs is respected. Furthermore, syntactic features are taken to belong into two basic categories. There are features that establish the Agree relation between a Probe and a Goal and others that are parasitic on Agree (as is the EF and the CaseF), the latter in the sense that they cannot independently specify the Goal for the Probe (see Chomsky's (2001) discussion about the EF, especially fn. 5). For convenience, I will call the former "Substantial features" and the latter "Functional features"[24]. Nevertheless, notice that within the present framework, both categories of features are interpretable at the interface levels.

For the cases that will concern us here, there are four features that derive A'-constructions (I will not refer to the CaseF); that is, the EF, the QF, the WhF and the the ØFs (relevant to the subject and the object). The EF is supposed to be the functional one while the other three are the substantial features. The EF of the strong phase-heads requires (or more accurately, carries the instruction from the interface levels) that in a local configuration (in other words, in the Spec position) of the specific head a copy of a SO must be realized. Whether this copy will be overtly realized or not will depend on the completeness of the feature matrix of the strong phase-head which bears the EF (to be clarified as the discussion proceeds). The WhF specifies the Goal for the Probe[25]. It literally defines the relationship between the two, namely a wh-construction. The QF defines the interrogative nature of the wh-construction. The fact that it is a question and not a relative construction depends on the QF of C. Following Chomsky's (in press) proposal, the ØFs (structurally specifying the clausal subject) are intrinsic properties of the C-head. Nevertheless, it will be assumed, under certain argumentation, that they can be transmitted to T or not and they can be "complete" or "incomplete" (the latter in the sense of Chomsky

[24] I borrow the terms, but not their content, from Rizzi (in press).
[25] See McCloskey (2002) for developing a similar "WhF" to account for successively cyclicity, though within a different framework.

2000a; that is, T versus T_{def}) yielding different properties. Last but not least, under the present framework, the Agree operation is taken to be an operation of "feature-matching" rather than an operation of "feature-valuation". The features that are supposed to establish the Agree relation between the Probe and the Goal, namely the substantial features, should "match" on the basis of this relation. On the contrary, the functional features do not require "matching" because they operate parasitically on Agree, as already noted. Nevertheless, for a derivation to "freeze" all feature-needs (both substantial and functional) must be met. An explanation is in order here. In line with Chomsky's (2000a and 2001) remarks (also discussed in Chapter 1 of the present paper), there is strong evidence that one of the intrinsic properties of the FL is the property of computational economy. To be more specific, within the framework proposed in the above papers it is supposed that the elimination of uFs during syntactic derivations takes place as quickly as possible. Contrary to what was proposed at the early period of Minimalism (see the formulation of the "Procrastinate Principle" in Chomsky 1995), it is assumed that once a SO enters a derivation, it initiates and finalizes its syntactic computation within the C_{HL}. This implies that the distinction between operations that take place in the C_{HL} (overtly) and others which are postponed after the S/O (covertly) (see also fn. 9) cannot and should not be formulated. A natural principle, then, which is proposed, virtually reviving Pesetsky's (1989) "Earliness Principle" that syntactic operations must take place at the earliest possible stage, is the following:

22) "Maximize Matching Effects" (MME) (Chomsky 2001: 15)

According to (22), "feature-valuation" under Agree takes place immediately after the introduction of the SOs in the derivation. Then for reasons of computational economy, once a Probe and a Goal Agree, they must value all their uFs and provided that this is not feasible then a Probe is allowed to seek for another Goal or a Goal to agree with another Probe. If a Probe or a Goal have valued all their uFs, they will "freeze" at the relevant stage of the derivation, in the sense that they will become unavailable (or inert) to further computations.

In the currently proposed framework (22) is adapted in such a way that it will not refer to a "feature-valuation" operation, since uFs are not adopted, but to a "feature-matching" operation. In particular, a Probe agrees with a Goal and both "match" their features under this relation. I understand "feature-matching" in terms of an intrinsic instruction imposed by the interface levels on features with approximately the following meaning:

23) "find and agree with an identical feature"

Notice, however, that the term "identical" is somewhat misleading. For instance, the WhF carried by a wh-element is not identical to the WhF carried by v*. The former specifies the properties of the SO, namely that is a wh-element and renders it an available Goal whereas the latter defines the probing properties of the strong phase-head v* as specified by the interface levels[26]. One could stretch this argument even further and dispense with two "semi-identical" iWhFs by taking the WhF to be unique

[26] Recall that in Chomsky (1995) the argumentation for the existence of uFs derives from similar grounds. However, under economy considerations, if movement operations are somehow ensured and disconnected from the presence of uFs (as is tentatively pursued in the present approach), the latter may seem redundant. The adoption of uFs consists of an additional burden for the theory, since their presence should be independently supported and their properties clearly discriminated from their interpretable counterparts.

in the lexicon but bear certain properties depending on the "feature bundle" (the SO) it will be a part of, once this "feature bundle" is selected by the C_{HL} to enter the numeration. Thus, if the WhF is in the "feature bundle" which defines v* (a functional head) it will have probing kind of properties. On the other hand, if the same feature is in the "feature bundle" of a LI (i.e. a D) it will have properties similar to a Goal and to LIs. This argument offers the advantage of obviating the apparently indispensable requirement that was raised by the adoption of uFs. In particular, according to the discussion in Chapter 1, C is assumed to bear a iWhF while a wh-element a uWhF. It seems, however, rather deterring the attempt to justify the grounds on which the interface levels can, in principle, interpret the former but not the latter. If the above remarks are on the right track, it should be correct that once SOs, either a Probe or a Goal[27], enter a derivation, they carry iFs which should abide by (23). Then, (22) predicts both the time that (23) should be respected ("at once") and the fact that if and only if all the iFs of a Probe match with the respective features of the Goal, then they both "freeze" without taking part into further computations.

In the following section wh-object movement constructions from finite clauses will be examined under the currently proposed framework.

2. Wh-object movement from finite clauses

Let us examine the derivation of the following case:

24) a. whom do you think that the police arrested?
b. [$_{CP}$ whom do [$_{TP}$ you <whom> think [$_{CP}$ <whom> that [$_{TP}$ the police <whom> arrested <whom>]]]]?

[27] Notice that in the currently proposed system a Probe is not distinguished from a Goal. However, this is not necessarily a problem (p.c. Ian Roberts).

To start with, as is shown in (24b), which represents the base structure of (24a), the wh-element "whom" EMs as the Internal Argument (IA) of v* and receives the θ-role of the GOAL[28] from V. Recall also the discussion in Chapter 1, section 2, concerning the properties of EM and the Argument Structure. What was left unexplained there, but will play an important role in the present framework (especially in the discussion concerning the derivation of the wh-subject) is Chomsky's proposal of the "Th-criterion". To be more specific, Chomsky (1995) argues that "s-selection" positions are unique since they are positions dedicated to arguments and θ-roles are assigned configurationally within the Theta domain, namely v*P[29]. In the same line of argumentation Chomsky (2000a: 103) further proposes the following principle:

Th-criterion

25) "Pure Merge in Th positions is required of (and restricted to) arguments"

Focusing only on the strong phase-heads, what is interesting with the above criterion is the fact that it seems a natural property of v* to assign one and only one "role" (we will return to the content of this in the next Ch.) to the argument with which it EMs, namely its EA. Notice further that the θ-role of the IA is assigned by V and not v*. Leaving things as they are with the aim to return to the matter as the discussion proceeds, the wh-element bears three Fs[30], namely a QF, a WhF and **Ø**Fs. As previously defined, the WhF specifies the category of the SO whereas its QF refers to one of the roles that this SO has to take up during the derivation, as defined by the

[28] It is a common practice that θ-roles are represented in capitals.
[29] Contrary to Hornstein (1999), Manzini & Roussou (2000) and Manzini & Savoia (2002), who argue that there is not any empirical loss if one takes θ-roles to be Fs.
[30] Since in the present framework all Fs are supposed to be interpretable, there is no need for the use of the "i" before F.

interface levels; that is, the role of the question element. The ØFs define its initial "structural role", that of the object (specifically, wh-object due to the WhF), not its thematic one; this is assigned by V. On the other hand, v* bears an EF, a WhF and the ØFs of the object. The former is the functional one while the latter are the substantial features on which Agree will be established:

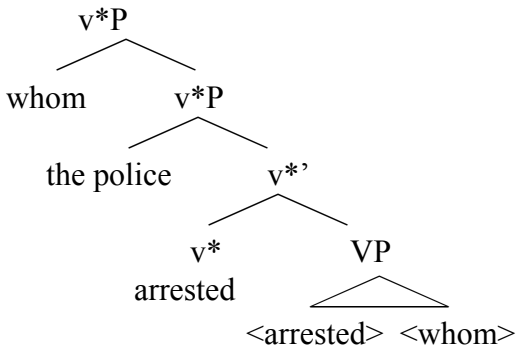

Figure 10

In Figure 10, v* agrees (according to 23) with "whom", both match their WhFs and ØFs and the latter IMs in outer Spec-v*, triggered by the functional EF of v*. However, the derivation of the wh-element should not freeze, since MME is not met (see 22); "whom" bears a QF which is not matched against an identical counterpart of a probing head. The first LsA is exhausted but PIC_2 predicts that the complement of v* will not be spelled out before the introduction of the next, strong phase:

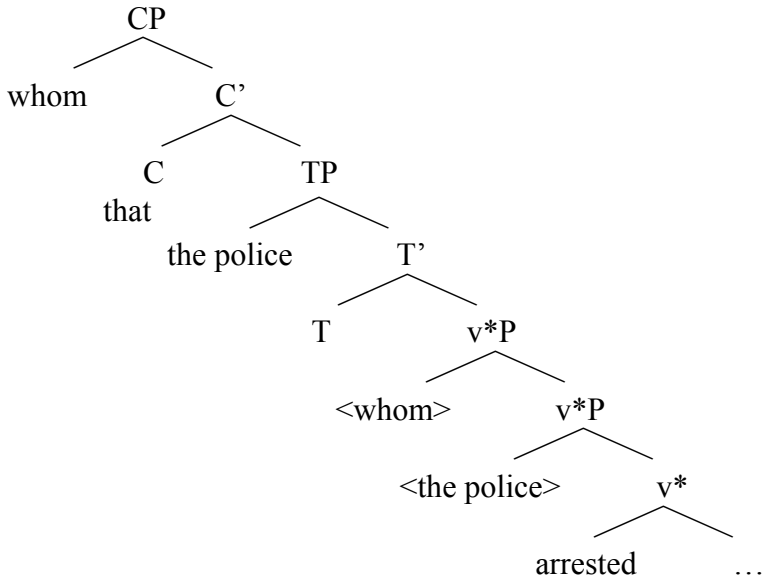

Figure 11

The next LsA, containing C and T is introduced while the complement of v* is spelled out as soon as C is introduced. C in Figure 11, bears a WhF, an EF and ØFs (defining the "structural role" of the clausal subject, but not its thematic role; this is assigned by v*), for reasons already discussed. Notice, however, that C does not bear a QF. An explanation is in order. It is a rather standard assumption (see also Roussou 2002 for further discussion) that EM of "that" on C means that there is a feature on C, conventionally say "D", which is literally a feature denoting Declarative clauses. When C introduces a Declarative clause it cannot introduce the same time a Question clause. Therefore, it is assumed that the QF and the "DF" on C are in complementary distribution, in the sense that Merge of one on C requires the absence of the other on the same phase-head (we will return to this in Ch. 4). As things stand so far, C transfers (in accordance with Chomsky (in press)) its ØFs to T; T (by inheritance) agrees and match its ØFs with the EA of v* and the latter IM in Spec-T to satisfy the

EPP (we will return to the derivation of the subject in the following Ch.)[31]. C agrees (according to 23) with the wh-element which is in the outer Spec-v*, and the latter IMs in Spec-C to satisfy the EF of C. A crucial point which should be clarified here concerns the nature of agreement between C and the wh-element. Recall, that within the present framework all Fs are interpretable. This yields that features "match" with each other, they are not "valued" contra previous assumptions. Therefore, unless MME is met, they continue triggering further computations. Under these considerations, the wh-element agrees with C again on the basis of their WhFs because previous agreement of the wh-element with v* did not meet MME. Continuing with the derivation, the complement of C is not spelled out before the introduction of the next strong phase:

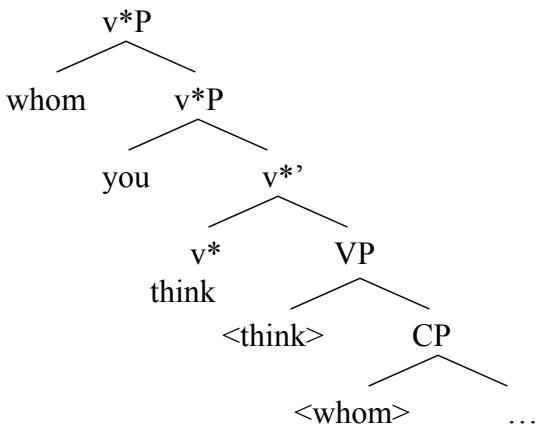

Figure 12

According to PIC_2, the complement of C is spelled out the same time v* is introduced in the derivation. As previously, in Figure 12, v* agrees and matches its WhF and ØFs with the wh-element's WhF and ØFs and the latter IMs in Spec-v* driven by the EF of v*. Nevertheless, MME is not met. The derivation continues and the last LsA is introduced:

[31] It is supposed that the EA receives structural Case from T (Nominative). It is possible to take the CaseF to be a functional one since it operates parasitically on Agree. Nevertheless, I will not refer further to the matter.

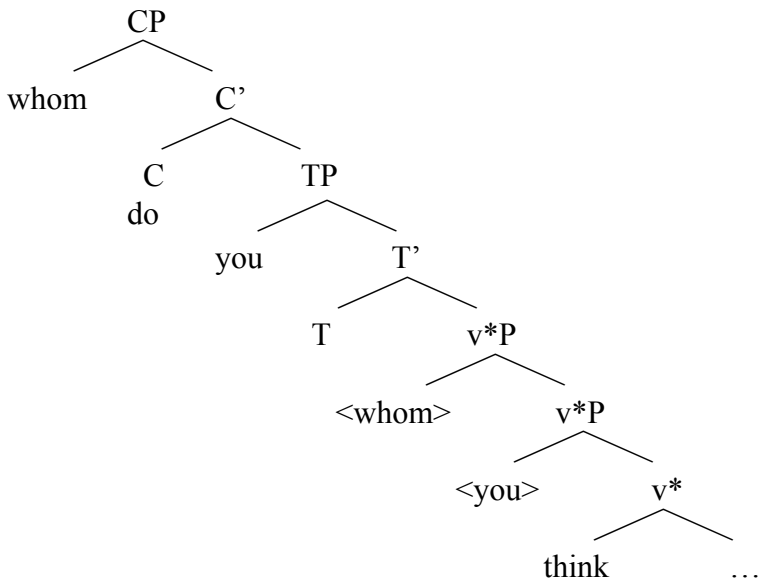

Figure 13

Once the matrix C merges the complement of v* is transferred to S/O. C bears four features; a QF, a WhF, ØFs and an EF. It is a final C position, "a criterial position" bearing "freezing" properties of the kind proposed by Haegeman (1995) for Negation, Rizzi (1990), (2000) & (in press) for Spec-C (wh-) and Spec-T (wh- or not) positions, Brody (1990) for Focus and Roberts and Roussou (2002) for Spec-T. C transmits its ØFs to T and the latter agrees with the EA of v*; in turn, the EA IMs in Spec-T to satisfy EPP. Also, C agrees with the wh-element on the basis of their QFs and WhFs. Then, the wh-element IMs in Spec-C driven by the EF of the latter. Notice that MME is met, since all the Fs of the Goal ("whom" in Figure 13) are matched with all the Fs of the Probe (C) and the functional features of the latter are satisfied. The derivation is transferred to S/O and converges at the interface levels.

To sum up and conclude, the currently proposed ideas are in line with the system of phases as the latter is further developed in the recent literature. In the present section it is argued that the derivation of the wh-element in A'-constructions is driven by specific iFs, which carry operational instructions from the interface levels

to the C_{HL}. The idea that strong phase-heads are the only probes within a derivation is preserved while it is further shown that the IFM Hypothesis (discussed in Ch. 1, section 2) is not a necessary conceptual tool within the current framework. On the other hand, the special reference to the intuition behind the adoption of the "Th-criterion" will play a special role in the discussion concerning the derivation of the wh-subject. In the next section we will refer to wh-object movement from non-finite clauses capitalizing on the selection properties of C over T.

3. Wh-object movement from non-finite clauses and a possible symmetry

Within the changes proposed in Chomsky (in press), it is assumed that when T is selected by C it is always phi-complete since T inherits its ØFs from C. On the other hand, when T is selected by v* (Chomsky (in press) attributes selection properties to v* and not V) it does not bear a complete set of Agreement Fs. However, in section 3 of Chapter 1, it was argued that wh-object movement from non-finite clauses raises doubts about the alleged selection properties of the strong phase-heads over T. In particular, it was shown that a non-finite T, in wh-infinitive constructions, is still selected by C. On optimal assumptions[32], the previous considerations yield one basic hypothesis. In particular, if a non-finite T, in wh-infinitives, can be selected by C, it would be possible and preferable that all non-finite Ts are always selected by C. This implies that even in ECM constructions (see 27) the non-finite T is selected by C. Notice that an early formulation of the idea that in ECM constructions it is not V but C that selects T is in Kayne (1984).

[32] Optimal assumptions are raised when a hypothesis revealing the interactive nature of the relation between the interface components and the C_{HL} is put forward. Each time this expression is used it will be meant in this sense.

Let us examine the following cases within the present framework (example 13 repeated as 26):

26) a. Does John wonder what to do?
    b. *what does John wonder to do?

27) a. What does Mary want to say? / What does Mary wanna say?
    b. *Does Mary want what to say?

To start with, from the ungrammaticality in (26b) it is shown that the wh-element under certain circumstances must appear between v* and T in Spec-C, whereas (27b) (notice that (27) is an ECM construction) shows that the same position is illicit under other circumstances. Obviously, the verbal properties ("wonder" in (26) and "want" in (27)) are responsible for licensing a wh-element to appear in Spec-C. Abstracting away from the properties of the selecting V and focusing on the selection properties of C over T, an optimal conclusion would be that C always selects T. If this is on the right track, what one could say about the difference between (26) and (27) is that in the former case, C is a criterial head bearing all the necessary Fs for the wh-element to "freeze" in Spec-C, whereas in (27) C is a weak phase (along with v) bearing only a set of incomplete ØFs. Notice that in the latter case an optimal symmetry between the two strong phase-heads C and v* raises; both turn to weak phases under certain circumstances.

Since the derivation in (26) has already been discussed in Chapter 1, for reasons of space it will not be analyzed here. However, it should be mentioned that within the presently proposed framework, the intermediate C bears a QF, a WhF, an EF and ØFs. The latter are transmitted to T and C agrees directly with the wh-element, which is in the outer Spec-v*, both match their Fs and "what" IMs in Spec-C

to satisfy the EF of C. Then, MME is met and the derivation converges at the interface levels. On the other hand, the derivation in (27) proceeds as follows[33].

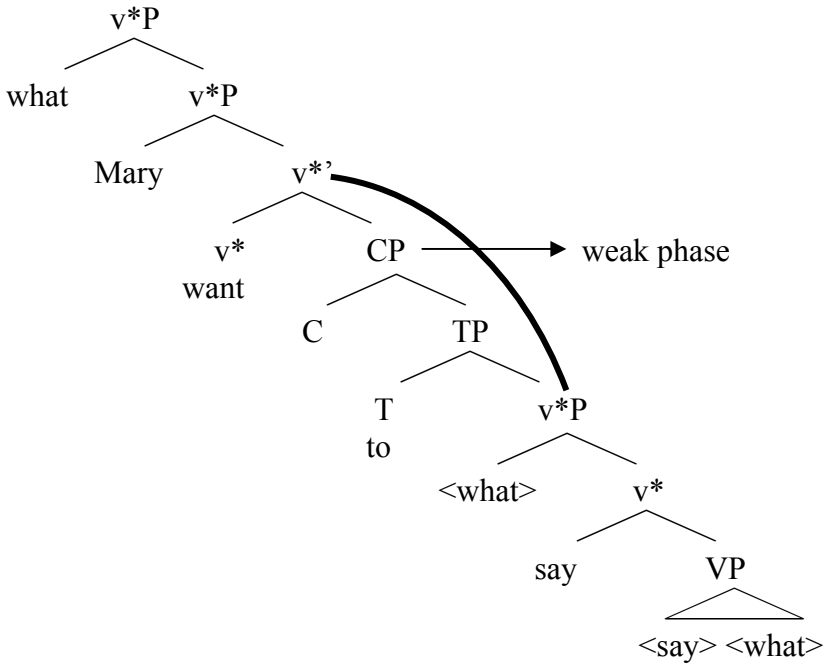

Figure 14

In Figure 14, two strong phases (v*Ps) and a weak one (CP) are represented. To start with, the wh-element, which bears a QF, a WhF and ØFs enters the derivation and EMs as the IA of v* "say" (I abstract away from the case of PRO). The lower v* bearing an EF, a WhF and ØFs specifying the object, agrees with "what" both match their WhFs and ØFs and the latter IMs in Spec-v* to satisfy the EF of v*. However, MME is not met since the wh-element bears a QF which is not matched. The first LsA is exhausted and the derivation proceeds by introducing the second LsA containing C and T. If the previous assumptions are on the right track, C does not introduce a strong phase due to its "defective" character (in the sense of Chomsky 2000a). In

[33] For the pre-Minimalism argumentation, contra kayne's (1984) approach, that in ECM constructions T is selected by V, see Haegeman 1994: 169-170.

particular, C bears only incomplete ØFs relevant to the subject, which transmits to T[34]. If this is correct, in accordance to PIC_2 the lower v*P is not spelled out even after the introduction of C, since the latter is not a strong phase-head. Neither is CP transferred to S/O. Notice here that an interesting possibility could be that C does not transfer its ØFs to T but v* IMs in C, yielding the "wanna" verb-type (27a), assuming that the ØFs of the subject are realized by the verb morphology on C. The derivation proceeds by introducing the next LsA, namely the matrix v*P. When v* is introduced the complement of the lower v* is spelled out in line with PIC_2. The matrix v* bears an EF and a WhF. Due to the fact that CP is not a strong phase, v* probes and agrees with the wh-element in the lower Spec-v*, both match their WhFs and the latter IMs in the matrix Spec-v* to satisfy the EF of v*. As far as the wh-element is concerned MME is not met, since it bears a QF which is not matched. The next LsA, namely CP, is introduced and the complement of v* is spelled out by the time C is merged:

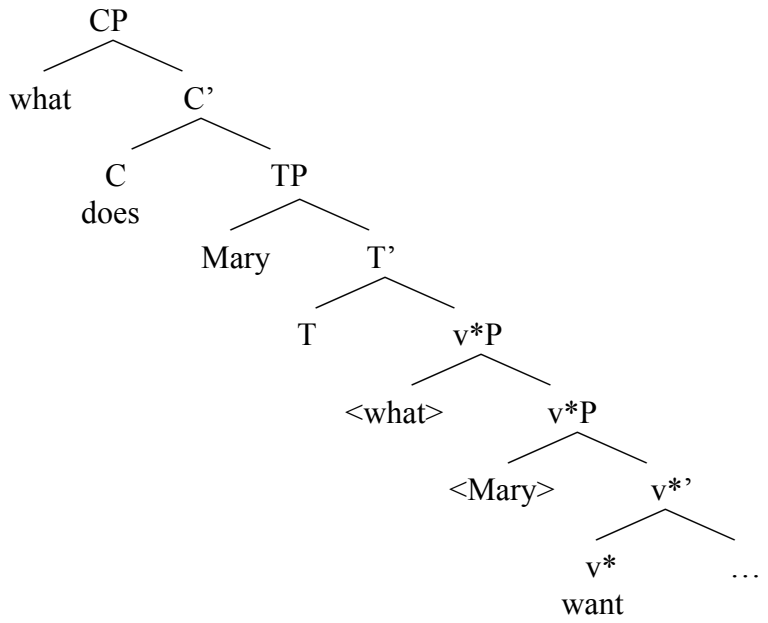

Figure 15

[34] Notice that in the case of (26), C is not at all defective, since it bears an EF, a QF, a WhF and ØFs. This means that the defective character of C does not depend on the completeness of ØFs, but on the set of Fs instantiated on C. The hard question that remains to be answered is why the ØFs transmitted to T are not complete as in other cases. In particular, why C bears both options of ØFs.

C, in Figure 15, merges with T bearing an EF, a QF, a WhF and ØFs. It transmits the ØFs to T and the latter agrees with the EA of v*. Both match their ØFs and the EA IMs in Spec-T to satisfy EPP. On the other hand, C agrees directly with the wh-element in the outer Spec-v*, both match their QFs and WhFs and the latter IMs in Spec-C to satisfy the EF of C. Then, MME is met, the derivation is spelled out and converges at the interface levels.

To sum up and conclude, the present section explored the possibility, which is welcome on optimal assumptions, that C always selects T. Then, concentrating on ECM constructions, if the pursued analysis is on the right track, it should be correct that a symmetry between the two strong phase-heads is that both bear weak phase-properties under certain derivational environments. Undoubtedly, the nature of these environments, which define the selection properties of C over T, are directly affected by the properties of the selecting verbs. An additional explanatory burden of the pursued approach lies in the fact that C bears both options as far as the completeness of QFs transmitted to T is concerned.

4. Conclusions

The conclusions of the present Chapter are the following. First of all it seems feasible to dispense with uFs once movement operations are predicted to derive from independently motivated principles. This is additionally supported by the fact that wh-object movement from finite clauses can be captured under the proposed framework. As far as wh-object movement from non-finite clauses is concerned, a possible symmetry was raised between strong phase-heads; provided that C, a strong phase-head, always selects T, then the former exhibits weak phase properties (along with v)

once it is introduced in certain derivational environments, such as in ECM constructions.

In the following Chapter wh-subject movement will be examined under the currently pursued framework and further phase symmetries will be underscored.

Chapter 4

0. Introduction

The special reference to the core idea that the "Th-criterion" reflects concerning the number of θ-roles that SOs take up within a domain, will be extended as the discussion proceeds and adapted to the framework of phases. From this, a symmetry between the two strong phase-heads C and v* will naturally emerge; contra Chomsky (in press) it will be argued that, on the one hand, the subject / object asymmetry is only superficial since it derives from the same principle which characterizes the strong phase-heads and on the other hand it will be shown that the same principle justifies the symmetry between the derivation of the passive predicates and the wh-object movement.

1. Wh-subject movement and the "Uniqueness Principle"

The "Th-criterion" requires that in the v*P domain, v* must assign only one θ-role to a SO, namely the θ-role of the AGENT to its EA, while the θ-role of the GOAL to its IA is assigned by V. Following the argumentation which was developed in the introduction of the previous Chapter concerning the interaction between the interface levels and the C_{HL}, one may argue that the "Th-criterion" is a requirement of the interface levels imposed on v*. Then, immediately, two thoughts emerge. Firstly, how this criterion can be implemented into the framework of phases and secondly if the properties that the criterion reflects are not only imposed on v* but also on C. Both

thoughts are based on optimal assumptions. In principle, once we adopt the system of phases for the description of the derivation of linguistic expressions, we want any principle or condition to be a property of phase-heads operating during the derivation of phases, the latter in the sense that we should not resort to terms such as "domains". The second thought is even more interesting. If there is a condition imposed by the interface levels on v*, which is a strong phase-head, optimally the same or a similar condition may be a property of C, which is also a strong phase-head. Under the above argumentation and capitalizing on the "Th-criterion" it seems reasonable to assume that the following principle is an independent principle imposed by the interface levels on strong phase-heads:

Uniqueness Principle (UP)
28) A strong phase head H must assign only one role to the same SO, during the derivation of the same phase HP.

An explanation is in order. In (28) the term "role" is chosen to account for both "θ-roles" and "structural roles" (say for convenience, "s-roles"). The framework of Chomsky (1981) is adopted here to account for the θ-roles. As far as the introduction of the s-roles is concerned, it should be correct to assume, under optimal assumptions capturing Chomsky's (in press) intuition about the derivational power of the strong phase-heads, that both strong phase-heads assign "structural roles" to SOs during a derivation; that is, roles taken up by the SOs in the course of a derivation. For the A'-construction we will focus only on the s-roles of the subject, the object and the wh-operator. Crucially, according to UP C or v* cannot assign two "roles" (referring to θ-roles and s-roles in the case of v*, but only to s-roles in the case of C, for obvious reasons) to the same SO during the derivation of CP or v*P, respectively. If this is on the right track, in line with UP, v* cannot assign the θ-role of the GOAL and the s-

role of the DO to the same SO, namely the IA, during the derivation of v*P; this is why V assigns the θ-role and v* the s-role (see the derivation of "whom" in 24). UP then may be the reason why v* bears the ØFs of the DO but V its θ-role. On the other hand, C assigns the s-role of the clausal subject since it bears the ØFs of the subject and in the case of A'-constructions the role of the wh-operator with clausal scope. It may be correct to assume that the EA of v* cannot be spelled out "in situ" (in Spec-v*) since the s-role of the clausal subject is assigned by C in Spec-T[35]. The object, however, is allowed to remain "in situ" since its θ-role and s-role are always assigned during the v*P phase. Also, the choice of "must" (in 28) makes the strong hypothesis that within the derivation of a strong phase HP, a strong phase-head is obliged to assign at least one role (θ-role and s-role for v* and s-role for C). If a strong phase-head does not assign any role during a derivation D, the derivation will crash, since there will be no other "role-assigner" to drive the specific derivation apart from the strong phase-head. In the case of the IA the θ-role will be assigned by V but not the s-role of the DO. The "Th-criterion" then, will be predictable (and hence redundant) under the assumptions of UP if we manage to ensure that θ-roles are assigned only to arguments.

Keeping in the same line of argumentation, let us examine the way UP is applied in the case of C and specifically the derivation of wh-subjects:

29) a. who caused the accident?
b. [$_{CP}$ who [$_{TP}$ [$_{v*P}$ <who> caused the accident]]]?

To start with, (29) is a transitive predicate. As far as the derivation of the first phase is concerned (v*P), v* merges with the EA, to which assigns a θ-role in line with UP,

[35] In the cases of expletive constructions, say "[$_{CP}$ [$_{TP}$ there is [$_{v*P}$ a woman walking down the street]]]", the EA of v* must remain "in situ" since the s-role of the clausal subject is assigned by C to the expletive "there". In this case the s-role of the subject is assigned to a different SO from the EA of v*.

and the VP. As in (29b) the EA is the wh-element which EMs in Spec-v*. PIC_2 predicts that the complement of v* will not be spelled out before the introduction of the next strong phase-head C. The next LsA is introduced in the derivation containing C and T. Following the currently proposed ideas, C bears a QF, an EF, a WhF and ØFs. The wh-element bears a QF, a WhF and ØFs:

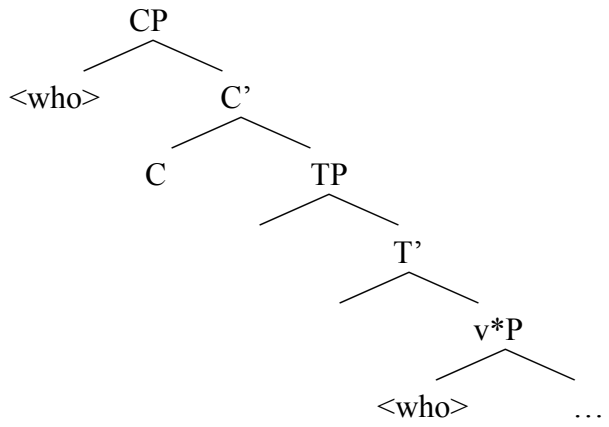

Figure 16

In accordance with Chomsky's (in press) assumptions (see Ch. 2, section 2), when C is introduced in the derivation it should transfer its ØFs to T. However, focusing our attention only on the derivation of the wh-subject, if C transferred its ØFs to T, UP would be violated and the derivation would crash. To put it on a more concrete footing, the reason (as discussed in Ch 2) for the ØFs to be an intrinsic property of C lies in the fact that ØFs render a head, which bears them, an independent Probe. Thus, under the assumption that only strong phase-heads are Probes, T cannot own independently ØFs because it is not a phase-head. This means that C is the real Probe for the clausal subject. On the other hand, in accordance with UP, C is not allowed to assign two s-roles to the same SO during the derivation of CP. By implication, the EA of v* in Figure 16, cannot take up two s-roles during the derivation of the same phase, namely the s-role of the clausal subject in Spec-T and

that of the operator in Spec-C, assigned by the same phase-head, namely C. Therefore, for UP to be respected, C in the case of wh-subject movement must not transfer its ØFs to T. If this is on the right track, the ØFs must be satisfied on C and Spec-T must be left empty[36]. Notice that in the case of wh-object movement C transfers its ØFs to T under the requirements of the same principle, UP. In particular, C and T (the latter by inheritance) should not probe for the same Goal. The s-role of the operator is assigned to the IA of v*, while the s-role of the clausal subject is assigned to its EA. Therefore, C must transfer its ØFs to T in order for the latter to probe the EA of v* in Spec-T. The previous considerations yield the conclusion that the derivation in Figure 16 should proceed as follows. C does not transfer its ØFs to T. It further agrees with the wh-element in Spec-v*, both match all their Fs and the latter IMs in Spec-C to satisfy the EF of C.

The problem that naturally stems from the above considerations concerns the fact that if, as just proposed, the wh-element does not pass through Spec-T, EPP will not be satisfied and the derivation will crash. One may also assume that if C retains its ØFs UP is violated and not if it transfers them to T. Nevertheless, on optimal assumptions once more, EPP should not be a problem. To be more specific, EPP is generally assumed to be the principle which requires that a DP must appear in Spec-T (EPP is taken in the traditional sense; see fn. 11). This means that EPP renders T an independent Probe. However, under the same argumentation that was developed about the ØFs, T cannot and optimally should not be an independent Probe, since only strong phase-heads are independent Probes. In other words, what is correct for the ØFs it should also be correct for EPP. In lack of further evidence, I will not assume that EPP is an intrinsic property of C along with the ØFs, though the currently

[36] In accordance with Chomsky (in press) the ungrammaticality of: *[$_{CP}$ who was [$_{TP}$ there [$_{v*P}$ never seen]? (p.15, ex. 12) is attributed to the fact that EM of "there" in Spec-T is blocked by the copy of "who". Under the present analysis EM of "there" is illicit since the ØFs of C are not transmitted to T.

developed argumentation points to that direction. I will, though, assume to be on the right track the fact that the edge properties of T (reflected by EPP) are "subsumed" by the edge properties of C (reflected by the EF) once both C and T probe for the same Goal, namely the EA of v*. Notice that in this case the s-role of the clausal subject is "subsumed" but not assigned by C to the same SO, namely the wh-operator. Due to the fact that UP must be respected but at the same time the clausal subject somehow realized, the derivation of the latter does not yield the expected subject construction. That is, although the ØFs are matched, EPP does not trigger IM.

Following the previous proposals, let us examine how both the ungrammatical case of wh-subject extraction and the case of the passive predicate, discussed in Chomsky (in press) and in Chapter 2, are captured under the present framework (examples 16, 17 repeated here as 30, 31, respectively)[37]:

30) a. *of which car did the driver cause the accident?
b. the driver of which car caused the accident

31) a. of which car was the driver found?
b. the driver of which car was found

Suppose that (30b) and (31b) are echo-questions, counterparts of (30a) and (31a) respectively. To repeat for convenience, (30) is a transitive predicate. The wh-element is embedded in the PP headed by the preposition "of", which is in turn embedded in the EA of v*, namely the matrix DP "the driver". On the other hand, (31) is a passive predicate. The matrix DP, in which the PP "of which car" is embedded, EMs as the object of the passive verb "was found":

[37] For reasons of simplicity we will examine the parts of the derivation in question.

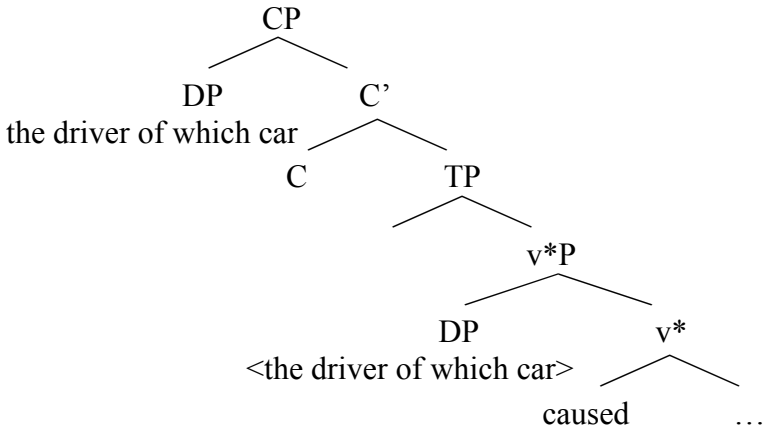

Figure 17

To start with the derivation in (30b), represented in Figure 17, C does not transfer the ØFs to T, otherwise UP will be violated. C then agrees[38] with the EA in Spec-v* and both match all their Fs. Consequently, the whole DP IMs in Spec-C to satisfy the latter's EF and the derivation converges at the interface levels since MME and UP are respected. (30b) is the only possible option of the derivation since the DP IMs from Spec-v* in Spec-C. On the other hand, (30a) is ungrammatical for two basic reasons. On the one hand, it is predicted by UP that IM of a part of the DP, namely "the driver" in Spec-T is illicit. In particular, since the ØFs are satisfied on C and EPP is subsumed by the edge properties of C, there is not any argument to justify IM of the DP in Spec-T. On the other hand, once the whole DP IMs in Spec-C directly from Spec-v*, as shown in Figure 17, extraction of the PP "of which" is illicit since there is not any available position beyond CP to host the PP complement. To be more specific, even if we assume the articulated Left Periphery of Rizzi, the QF cannot be responsible for the projection of two specifiers[39].

[38] Feature percolation considerations can account for the fact that the Fs of the wh-element embedded in the matrix DP are "visible" to C. I will take his possibility at face value here.
[39] As is known multiple wh-movement in Standard English is not possible. See also Simpson 2000 for further discussion, especially Chapter 2.

In the case of the passive predicate in (31) the derivation proceeds as follows. The DP "the driver of which car" EMs as the IA of the passive verb "was found". Notice that, in line with the analysis in the preceding Chapters, passive predicates are supposed to carry properties of phases, though properties which render them "weak" and not "strong phases":

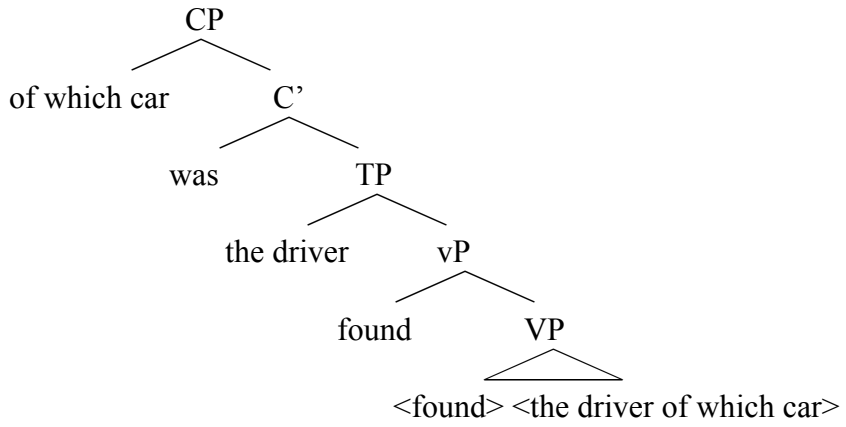

Figure 18

In Figure 18 the passive v, within the present framework, bears neither an EF nor a WhF, nor the ØFs of the object, as opposed to transitive v*; that is, it cannot assign the s-role of the object. Therefore, the wh-element does not match its WhF and QF. C merges with T and from this point the derivation proceeds as follows. C has two options. On the one hand, C can transmit its ØFs to T as in Figure 18. Notice that, in accordance with the definition in (28), UP is violated only if C or v* assign two roles to the same SO during the derivation of the same phase HP. Nevertheless, as it is shown in Figure 18, passive predicates stem from the simultaneous derivation of two phases; that is, a weak one (vP) and a strong one (CP) and the time that the weak phase will be spelled out depends on the time that the strong one will end. Hence, if C transmits its ØFs to T, we will have the derivation in Figure 18 (and 31a). That is,

similarly to the derivation of the wh-object, a DP must agree with T, both match their features and IM in Spec-T to satisfy EPP. The other option is for C to keep the ØFs and derive (31b). In this case, C agrees (see fn. 38) with the whole DP in Spec-v*, both match their Fs, namely the WhF, the QF and the ØFs and the DP IMs in Spec-C to satisfy the EF of C. EPP is again taken to be subsumed under the EF of C. In both derivations MME is satisfied and the derivation converges at the interface levels. It is assumed that the DP "the driver of which car" in Figure 18, adopting and adapting Burzio's Generalization[40], receives the θ-role of the IA from the passive V but not the s-role of the DO from v due to the weak phase properties of the latter. This assumption could account for the following observations. Firstly, the DP must escape vP and vP is not a strong phase since it cannot assign the s-role of the DO to the DP. Secondly and more importantly, the derivation of passive predicates bears properties of both the derivation of the subject and the object. This property could be attributed to the fact that the DP bears the θ-role of the IA but the s-role of the clausal subject assigned to it in Spec-T by C (since C bears the ØFs).

To sum up and conclude, in the present section the derivation of wh-subject movement is examined. It is argued that the Uniqueness Principle reflects a requirement imposed by the interface levels on strong phase-heads. If this principle is applied in the derivation of the v*P phase, it predicts that v* must assign one θ-role to its EA and one s-role to its IA. UP predicts that the θ-role of the latter is assigned by V. The "Th-criterion" may be immediately captured. On the other hand, the same principle applied on C predicts the following. In the case of wh-subject movement C must not transfer its ØFs to T otherwise it will assign two s-roles to the same SO (EA of v*); the s-role of the clausal subject and the s-role of the wh-operator. Thus, the

[40] Burzio's Generalization: a) A verb which lacks an EA fails to assign Acc Case and b) a verb which fails to assign Acc Case fails to θ-mark an EA (Burzio 1986: 178-9 & 184).

ØFs are satisfied on C and the EPP is subsumed by the EF of C since C and T probe for the same Goal. In the case of wh-object movement C must transfer its ØFs to T. This is because the Goal of C is the IA of v* while the Goal of T (it is a Probe by inheritance) is the EA of v*. By implication then, the s-role of the clausal subject must be satisfied in Spec-T while the s-role of the wh-operator must be satisfied in Spec-C. In the case of the passive predicates there are two options available to C. Due to the special properties of passive v in terms of phase-hood, the derivation takes place within two phases simultaneously. Therefore, UP is not violated either if C transmits its ØFs to T and yields derivations similar to the wh-subject one (though echo-questions) or if it retains its ØFs and yields derivations similar to the wh-object one.

2. Wh-subject extraction from embedded "that-clauses"

In the last section of Chapter 2, it was argued that the framework of A'-movement as is being developed from Chomsky (2000a) up to Chomsky (in press) is not adequate enough to capture the ungrammaticality of wh-subject movement from embedded "that-clauses". It was further shown that relevant assumptions of an earlier stage of the theory cannot and should not be adopted within the present theoretical field. However, the currently proposed framework, as it is developed in Chapter 3 and the present Chapter, is able to account for the specific derivation. The crucial example is the following (example 19, repeated here as 32):

32) a. *who do you think that got the promotion?
b. [*who do you think [$_{CP}$ <who> that [$_{TP}$ [$_{v*P}$ <who> got the promotion]]]
c. who do you think got the promotion?

Let us follow the derivation in (32) step by step. The first LsA which is introduced in the derivation is the transitive predicate v*P:

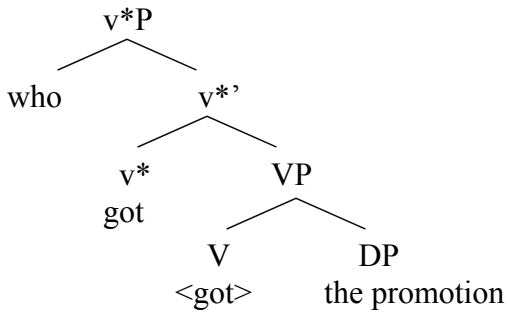

Figure 19

Focusing, for simplicity, on the derivation of the wh-element, "who" EMs as the EA of v* receiving the θ-role of the AGENT, in accordance with UP. The wh-element is in Spec-v* bearing a QF, a WhF and ØFs in line with the current framework. All the LIs in the first LsA have been exhausted and the derivation proceeds by introducing the next LsA in Figure 20. The complement of v* is not spelled out before the introduction of the next strong phase head C (in line with PIC_2):

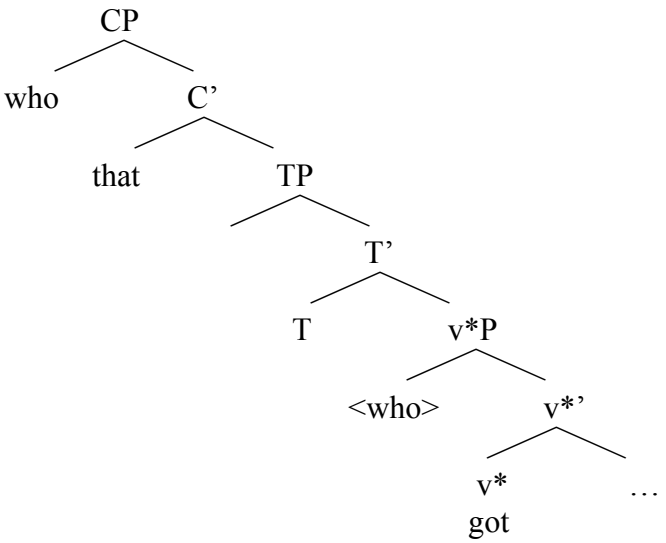

Figure 20

C and T are introduced in the derivation. Crucially, the Fs that the intermediate C (matrix in Figure 20) bears are the EF and the WhF without the QF and the ØFs. An explanation is in order here. Recall that in the relevant discussion, in Chapter 2

section 2, it was argued that EM of the complementizer "that" is in complementary distribution with the QF of C which introduces a Question clause. Therefore, in Figure 20 the matrix C cannot bear the QF once the "that" is overtly realized. Nevertheless, C does not bear ØFs either. The idea to be implemented[41] stems from Rizzi's (1990) assumptions that "…in English a tensed complementizer can be realized as "that" or Agr [Agreement]" (p. 52). To be more specific, Rizzi, discussing similar kind of phenomena within an earlier framework, argues that once Agr is instantiated on C in terms of a feature, C must not be overtly realized by the "that" and, interestingly enough, he further points out the fact that provided Agr is instantiated on C then Spec-C must be occupied by a wh-operator. Keeping things simple, we could assume that in Figure 20, EM of "that" blocks both the QF and the ØFs to be instantiated on C. Notice here that the previous assumptions provide an additional argument, along with UP, in favor of the idea that in the case of wh-object movement ØFs of C must be transmitted to T. This is because EM of "that" in intermediate C heads is freely available (see example 24). Therefore, ØFs must not be instantiated in the same heads[42] and the fact that they are transmitted to T does not violate UP.

If the previous assumptions are on the right track, the derivation in Figure 20 crashes for the following reason. As proposed in section 1 of the present Chapter, in the case of wh-subject movement C must not transmit its ØFs to T, otherwise the derivation will crash because UP will be violated. In Figure 20, however, EM of

[41] See also Roussou (2002) for adapting the same idea in her proposed analysis of the same phenomenon. Roussou (2002) extends an earlier work based on Manzini and Roussou (2000) where they capitalize on the operation of pure Merge and dispense with Movement mechanisms. Notice, however, that in the presently proposed framework Movement operations are retained. The crucial point is that the EA in Spec-v* does not IM in Spec-T but directly in Spec-C under certain considerations.

[42] Recall that EM of "that" in final C heads, in the case of wh-object movement, is supposed to be blocked by the QF. Otherwise the derivation will crash because MME will not be met.

"that" blocks the instantiation of ØFs on C, which means that C cannot agree with the EA of v*. Then the derivation will crash both due the violation of MME and UP. On the one hand, the QF, the WhF and the ØFs of the wh-element and the WhF and EF of C will be spelled out without been matched and satisfied violating MME. On the other hand, C will be spelled out without assigning any role to any SO violating the strong hypothesis of UP; that is, the s-role of the wh-operator is not assigned within the specific derivation and the s-role of the clausal subject cannot be either subsumed or assigned (the latter as in the case of wh-object movement).

As things stand so far, in the case of wh-subject movement a prerequisite for the success of the derivation is that C will bear ØFs and this will not be blocked under any circumstances, otherwise the strong hypothesis of UP will be violated, since C will not be able to assign any s-role during a derivation. Lets us examine the derivation of (32c):

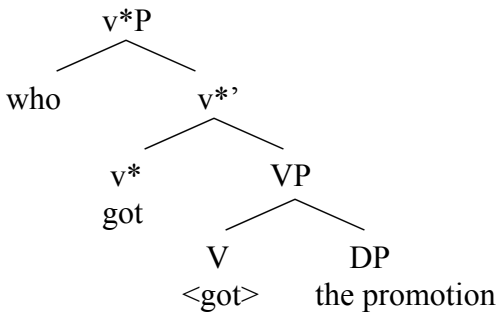

Figure 21

Figure (21) represents a transitive predicate. v* EMs with two arguments and assigns the relevant θ-role according to UP to its EA. Focusing on the derivation of the wh-element, "who" EMs in Spec-v* and bears a QF, a WhF and ØFs. In line with PIC_2, the complement of v* will be spelled out only after the introduction of the next, higher, strong phase-head:

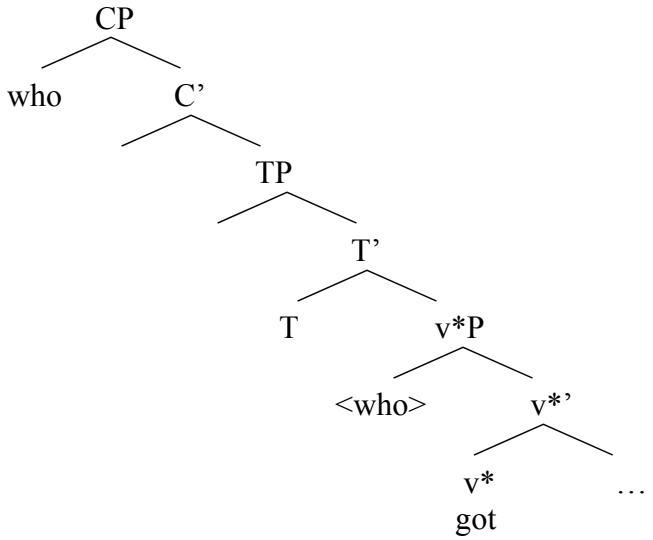

Figure 22

The next LsA is introduced having C and T. C bears a WhF, an EF and ØFs but not a QF. Notice here that an additional argument for the previous assumptions concerning Rizzi's observation stems from the following. Although the QF is not available in the intermediate C (matrix in Figure 22), EM of "that" is blocked because ØFs will not be instantiated resulting in the violation of UP. One may wonder then if there is any possibility for the derivation not to violate UP although both the QF and the ØFs are missing on C (as it is violated in 32a). In other words, if the derivation in Figure 20 could be licit and the wh-element could pass through Spec-C. As the matter of fact there is evidence that such kind of derivation is indeed possible under certain considerations to which will return in the following section.

Keeping to Figure 22, the wh-element agrees and matches its Fs with C (WhF, and ØFs) and the former IMs in Spec-C to satisfy the EF of C. However, MME is not met, since the QF of the wh-element is not matched. The derivation proceeds by introducing the next LsA, namely v*P, while the complement of C in Figure 23 is transferred to S/O the same time v* is introduced:

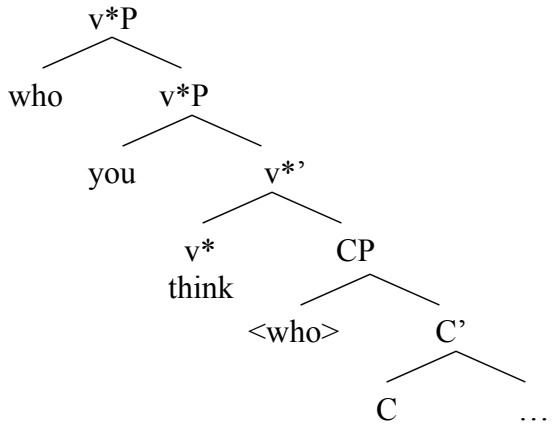

Figure 23

The wh-element agrees and matches its WhF with the respective WhF of v* and the former IMs in Spec-v* to satisfy the EF of v*. Nevertheless, similarly to Figure 21, MME is not met since the wh-element bears ØFs and a QF that are not matched. Recall that in the present framework Fs are not valued and "deleted" but matched; hence, they continue triggering computations until MME is satisfied. The next LsA is introduced containing the last LIs of the initial LA:

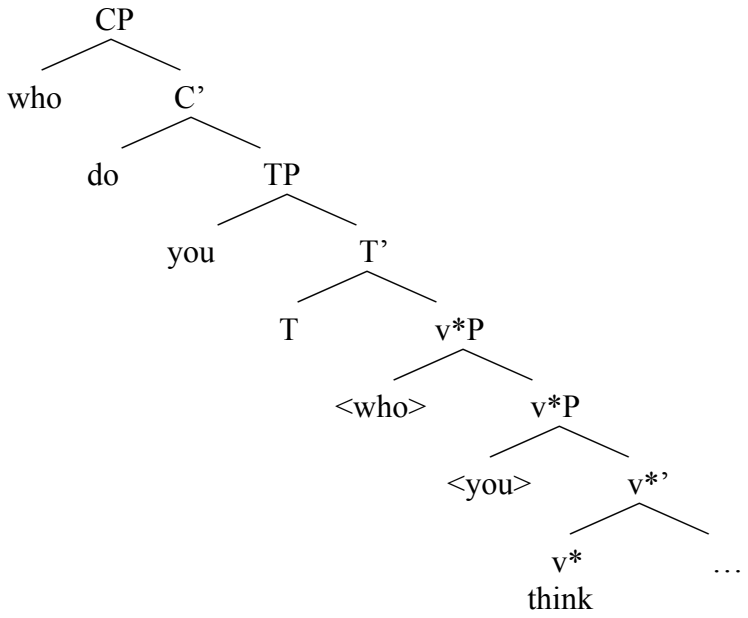

Figure 24

C and T merge, with the former bearing a QF, a WhF, an EF and ØFs. In principle, C transmits its ØFs to T. This is predicted by UP and MME. C must assign only one s-

role to the wh-element, the role of the wh-operator having clausal scope and the EA of v* must match its Fs with an optimal Probe. Therefore, ØFs are transmitted to T and the latter by inheritance agrees with the EA in the inner Spec-v*, both match their Fs and the EA IMs in Spec-T to satisfy EPP. On the other hand, C agrees with "who", both match all their Fs and the latter IMs in Spec-C to satisfy the EF of C. In both operations MME is met, UP is respected and the derivation converges at the interface levels after S/O.

To sum up and conclude, in the present section it is argued that the ungrammaticality of subject extraction from "that-clauses" can be captured under the proposed framework. It is shown that the complementizer "that" is in complementary distribution with both the QF and the ØFs of C. Therefore, in the case of wh-subject movement overt realization of the "that" blocks the instantiation of the ØFs on C, which in turn leads to the violation of UP and the derivation crashes. Nevertheless, as it is implied, there is evidence that in some cases such an illicit derivation (as in 32a) is at all respects grammatical. This will be the concern of the following section.

3. The Modern Greek paradigm and a possible parameterization

In the previous section wh-subject extraction from "that-clauses" in Standard English (SE) raised a very interesting matter. In particular, in line with the approach proposed in sections 1and 2 of the present Chapter, it is argued that it is not the extraction of wh-subject from a "that-clause" which leads to the crash of the derivation but it is that the strong phase-head C must retain the ØFs and not transfer them to T under the assumptions of UP. Specifically, if the "that" is realized on C the ØFs will be blocked

because they are in complementary distribution with the "that". It is further assumed that the intermediate C in (32c) does not bear a QF either. Although this assumption was taken at face value, it will be explained as the discussion proceeds otherwise "look-ahead" (see also the discussion about IFM hypothesis in Ch.1, section 2) will not be obviated.

In the same line of argumentation, it is very interesting to note that what seems to be ungrammatical in SE, concerning the derivation of (32a), is in all respects grammatical in Modern Greek (MG). To be more specific, in MG, wh-subject extraction from embedded "that-clauses" is grammatical and a very commonly used expression by the native speaker:

33) pjos nomizis oti prokalese
who:3SG:MASC:NOM think-you: 2SG:MASC:NOM that caused: 3SG
to atiçima ?
the: NEUT:SG:NOM accident: NEUT:SG:NOM
"*who do you think caused the accident* ?"

MG, as opposed to SE, is a "pro-drop[43]" (or Null Subject Language / NSL) language in the sense that the PF realization of the clausal subject in Spec-T is not necessary. Rizzi (1982) (see also Perlmutter 1971 for similar ideas), based on the syntax of the subject, argues that one of the properties that differentiates "pro-drop" from non "pro-drop" languages is the fact that the former exercise the possibility of extracting the subject across a *that*-type complementizer (see also Manzini and Savoia 2002: 158). This is the case in (33), where the wh-subject "who" is extracted from the embedded "that-clause" without causing the derivation to crash as opposed to (32a), where the same operation leads to ungrammaticality.

[43] Conventionally, these languages are called "pro-drop" in the sense that they drop the pronoun in the case of the subject.

Although (33) seems to be a counterexample to (32a) and raise problems for the analysis proposed in the previous section, it will be shown, by adapting a recent approach to the matter in the currently proposed framework, that the difference between the two derivations may reflect different properties of the strong phase-heads that trigger the operations.

To be more specific, Alexiadou and Anagnostopoulou (1998) / A&A, building on the work of Taraldsen (1978), Chosmky (1981), Rizzi (1982), Safir (1985), Borer (1986), Philippaki-Warburton (1991) and Alexiadou and Anagnostopoulou (1997) *inter alia*, argue that the ØFs of the subject are realized in the verbal agreement morphology and this is why in NSLs, such as MG, the subject does not need to be overtly realized in Spec-T by an expletive. They further propose that since the verb carries the ØFs of the subject, EPP is satisfied on T and not in Spec-T and this is why V moves to T[44], as opposed to SE where V remains in the Th-domain.

Keeping the essence of A&A's proposal and adapting it into the currently developed framework the following considerations derive naturally. As already discussed in the previous Chapters, strong phase-heads are supposed to be responsible for the computation of SOs within a derivation. If this is on the right track, not only is it natural but also obligatory, under optimal assumptions, for one to suppose that the ØFs of the subject in the case of NSLs are an intrinsic property of v* and not C. In particular, V along with T cannot be independent Probes but only Probes by inheritance. This is the reason why C bears the ØFs in the case of T. A possible parameterization between the two types of languages, then, could lie in the fact that in non-NSLs, such as SE, (in line with Chomsky (in press)) the ØFs of the clausal subject are an intrinsic property of C, while in NSLs, such as MG, the ØFs are

[44] A&A argue that satisfaction of EPP is possible either by the IM of a X^0 (as for MG) or a XP (as for SE). Although this is not really compatible with the bare phrase structure (p.c. Ian Roberts) I will take it at face value here.

intrinsically instantiated on v*. Then, in the case of wh-subject movement in NSLs, it is supposed that V IMs and adjoins to v*, inherits the ØFs and realizes them morphologically. Consequently, V matches, under the current framework, its ØFs with the ØFs of the EA of v* and the former IMs and adjoins to T to satisfy EPP[45]. Notice that such an operation does not violate UP. In particular, the θ-role of the AGENT is assigned by v* to its EA, the s-role of the clausal subject is assigned by v* and realized by the verbal morphology, and the s-role of the DO is assigned by v* to its IA. The only assumption that seems to require further argumentation - into which I will not engage myself - concerns the possibility that the proposed approach may recognize an additional head, similar to Agr_s (in the sense of Chomsky 1995: 146-147 & 256, following Pollock 1989) to account for the property of v* to bear both ØFs (p.c. Ian Roberts). However, it would be possible to assume that the ØFs are both instantiated on v* in the form of distinguishable s-roles of the subject and the object, since the violation of UP is not at stake. It may be possible that v* "knows" where to assign the s-role of the subject and the object from the distinction of the θ-roles. Specifically, it assigns the s-role of the object to its IA, while the s-role of the subject is realized in the verb morphology.

Let us implement this proposal in the current framework and account for the grammaticality of the derivation in (33). To start with, the first LsA, namely v*P, is introduced in the derivation:

[45] Notice that Rizzi (1982) develops a different approach to subject movement in NSLs from A&A. He assumes that the subject moves from a post-verbal position.

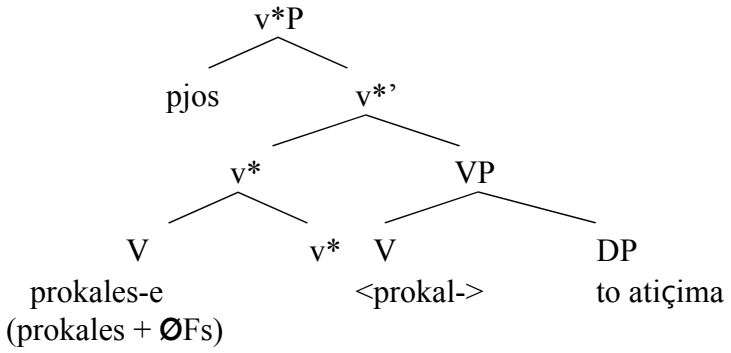

Figure 25

According to the proposal pursued, in Figure (25), the stem of the verb without the inflectional suffix EMs on V[46]. Then, it IMs and adjoins (as in the case of SE) to v*, collects and morphologically realizes the ØFs of the subject; the ØFs of the object are matched with the DP "to atiçima". The wh-element, in turn, EMs in Spec-v* bearing a WhF, a QF and ØFs and v* assigns the relevant θ-role in accordance with UP. Crucially, since v* is the Probe that bears the ØFs, it seeks for an optimal Goal. Therefore, the ØFs of the EA are matched with the ØFs realized on v*. Notice here that UP is not violated since v* assigns only one role to the wh-element, namely a θ-role and not the s-role of the clausal subject; the latter is instantiated in the verb morphology. Consequently, all the LIs are exhausted and the next LsA is introduced in the derivation, containing C, T and the complementizer "oti" (that):

CP

[46] Although this does not change anything, notice that Chomsky (2000a) argues that LIs enter the Numeration fully inflected.

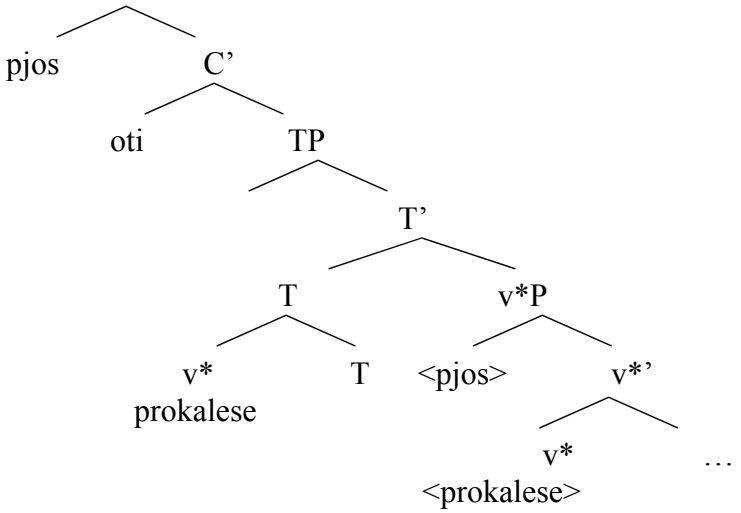

Figure 26

According to PIC_2 only when C merges should the complement of v* be spelled out. Crucially, T merges bearing EPP and C merges bearing an EF and a WhF. Recall that the **Ø**Fs are taken to be an intrinsic property of v* in NSLs. As for the QF, EM of the "oti" blocks the realization of the former. Notice here that this is an additional argument in favor of the intuition that in the SE counterpart (Figure 22), though the complementizer "that" cannot be realized because UP will be violated, since the **Ø**Fs on C will be blocked and C will not assign any s-role, the QF is blocked, as well. However, in the MG case, the "oti" can EM on C because the **Ø**Fs are instantiated on v* and not C. Furthermore, even if C does not bear the **Ø**Fs, UP is not violated. To be more specific, recall that according to the definition in (28) C must assign an s-role to a SO. As the derivation proceeds C agrees with the wh-element in Spec-v*, both match their WhF and the latter IMs in Spec C to satisfy the EF of C. Hence, C assigns to the EA of v* the s-role of the operator with clausal scope. Nevertheless, MME is not met since all the Fs of the wh-element are not matched. On the other hand, T probes (due to EPP; but see the relevant discussion in section 1) v* and the latter IMs

and adjoins to T to satisfy EPP. MME is met in this case since both the ØFs were previously matched and EPP is satisfied. The next LsA is introduced with the relevant LIs for the derivation of v*P. Skipping the specific part of the derivation for reasons of simplicity[47], we assume that the wh-element agrees with v*, both match their WhFs and the former IMs in Spec-v* to satisfy the EF of v*. As far as the wh-element is concerned MME is not met since it bears a QF which is not matched. All the LIs of the LsA are exhausted and the next LsA, which is the final one, is introduced in the derivation. In particular, C and T merge with the former bearing an EF, a QF and a WhF. Recall that the ØFs are an intrinsic property of v*:

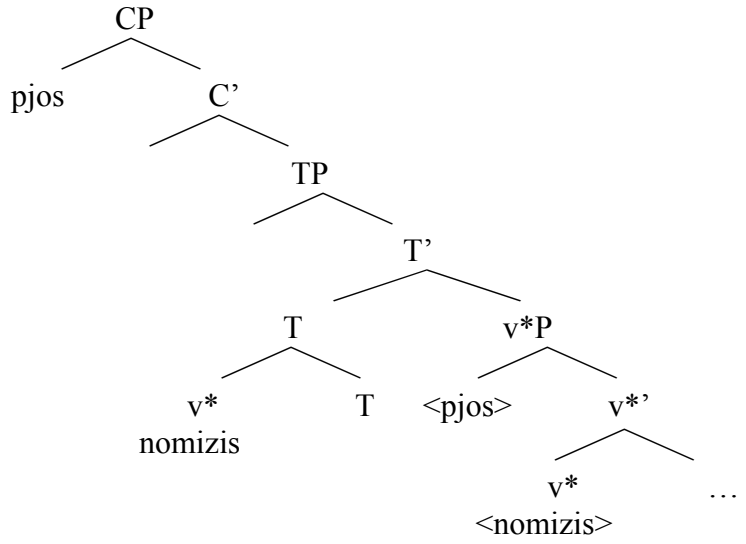

Figure 27

Crucially, in Figure 27, when C merges it agrees and matches its WhF and its QF with the wh-element and the latter IMs in Spec-C to satisfy the EF of C. Meanwhile v* IMs and adjoins to T to satisfy EPP. In both operations MME is met, UP is not violated and the derivation converges at the interface levels.

[47] An additional reason for leaving the derivation of the specific phase aside lies in the fact that it has to do with yes / no questions and not wh-ones in NSLs which seem to require special treatment if the present framework is to be adopted. However, I will not enter into this.

To sum up and conclude, in the present section a possible parameterization was pursued between NSLs and non-NSLs. It was proposed, capitalizing on the approach of A&A, that in the former case ØFs are an intrinsic property of v* and not C. This accounts for the fact that the verb in these languages realizes morphologically the nominal Fs of the subject. If this is on the right track, it can explain why in the case of MG wh-subject extraction from "that-clauses" is at all respects grammatical. Furthermore, this approach provides an independent argument for the absence of the QF from the intermediate C position in the SE example.

4. Conclusions

The present Chapter was devoted to the examination of wh-subject movement. To start with, it was proposed that UP, which reflects operational instructions of the interface levels, is imposed on the strong phase-heads, namely C and v*. This principle requires that each phase-head must assign only one role (s-role and θ-role for v* and s-role for C) to each SO during a derivation D. Therefore, v* assigns a unique θ-role to its EA but not a s-role (the θ-role to its IA is assigned by V) and C the s-roles of the wh-operator and that of the clausal subject. This yields the result that in the case of wh-subject movement, C cannot assign both s-roles to the wh-element; thus, it assigns the s-role of the wh-operator. That is, the ØFs are not transferred to T and the s-role of the subject is subsumed in Spec-C. The ungrammaticality of wh-subject extraction from "that-clauses" immediately follows, since the "that" is in complementary distribution with the ØFs of the subject. On the other hand, a possible parameterization between NSLs and non-NSLs is put forward. In the former case wh-

subject movement from “that-clauses” is licit since the ØFs of both the subject and the object are instantiated on v*, in the form of distinguishable s-roles and not on C. Therefore, EM of the “that” in Spec-C does not block their appearance.

Concluding Remarks

In the present paper we examined certain phenomena of A'-movement by employing the framework of phases, as the latter is developed from Chomsky (2000a) up to Chomsky (in press). As the discussion proceeded in the first two Chapters, certain points where raised to account for the fact that the explanatory power of the system of phases lacks specific amount of technical apparatus and conceptual justification so as to be more concrete. To start with, the postulation of uFs seems to be inadequate to capture wh-movement operations while "look-ahead" does not seem to be obviated by the assumptions of IFM Hypothesis. Furthermore, the theoretical assumptions concerning the selection properties of C over a finite T seem to require expansion over a non-finite T, in order for wh-object movement from non-finite clauses to be adequately captured. On the other hand, although current intuitions (Chomsky (in press)) concerning wh-subject movement seems to be on the right track, the conclusion that the base structure of a complex subject DP can account for subject / object asymmetries does not seem to stand on firm grounds. As a final point of concern, it seems that the current theoretical assumptions are inadequate to predict the ungrammaticality of wh-subject movement from embedded "that-clauses".

The aforementioned points compose and underscore the goal of the final two Chapters; that is, the attempt to give a plausible and adequate account for the above problems by keeping and extending the system of phases. This attempt, rather tentative, can be summarized as follows. In principle, the framework of uFs gives its place to a framework that takes Fs to carry operational instructions from the interface levels to the C_{HL}. This yields certain changes as far the mechanism the derivation of SOs is concerned. On the other hand, optimal assumptions and symmetry between the strong phase-heads seem to require the adoption of the Uniqueness Principle. The

intuition behind the principle is twofold. First, it is independently supported by the unique nature of the "Th-criterion"; that is, SOs are assigned unique θ-roles during the derivation of the Theta-domain. Extending and capitalizing on this, within a derivation D SOs bear certain "structural roles" which are in turn assigned by strong phase-heads, since only the latter drive derivations. C assigns only s-roles; that is, the s-role of the clausal subject and that of the wh-operator with clausal scope. In the former case, if the EA of v* is not the SO that will take up the s-role of the subject - in expletive constructions - it remains "in situ". Furthermore, C cannot assign, in line with UP, the same s-role to the same SO. Thus, in the case wh-subject movement, C assigns only the s-role of the wh-operator and the role of the clausal subject is subsumed in Spec-C. From the previous the ungrammaticality of wh-subject extraction from embedded "that-clauses" is captured; the complementizer "that" is in complementary distribution with the Agreement features and the QF on C. Therefore, UP is violated since neither the s-role of the wh-operator can be assigned nor that of the subject can be subsumed. On the other hand, the grammaticality of the MG counterpart seems to reflect different phase-head properties. In this case, it is assumed that v* intrinsically bears the property of assigning both s-roles, the s-role of the clausal subject and that of the object. Notice that UP is not violated since the s-role of the subject is realized in the verb morphology, while the θ-role of the AGENT is assigned to the EA. What is more, UP is respected in the case of the IA, since the θ-role of the GOAL is assigned by V while the s-role of the DO is assigned by v* and in the case of wh-object movement the s-role of the wh-operator is assigned by C. Last but not least, the resemblance that the derivation of the passive predicates bears with the derivation of both the subject and the object is an additional argument for the above approach. It is assumed that the DP is assigned the θ-role of the GOAL in its

base position by V, and the s-role of the subject in its landing position by C. UP is not valid due to the weak phase properties of v.

Interestingly enough, the approach, tentatively pursued, keeps two things apart. To be more specific, even if one dispenses with the part of the approach concerning the adoption of iFs, they can still retain the theoretical advantages of its second part, namely the idea of the UP and possibly that of the s-roles. last but not least, whether the aforementioned approach is on the right track or not is an empirical question that cannot be answered within the present space limits.

References

Alexiadou, A. & E. Anagnostopoulou (1997). EPP without Spec-IP. In *Proceedings of the Specifiers Conference*, University of York. Oxford: OUP.

Alexiadou, A. & E. Anagnostopoulou (1998). Parametrizing AGR: word order, verb-movement and EPP checking. *Natural Language and Linguistic Theory* 16: 491-539.

Alexiadou, A. & E. Anagnostopoulou (2001). The Subject-in-Situ Generalization and the role of Case in Driving Computations. *Linguistic Inquiry,* 32, 2: 193-231.

Aoun, J. and Yen-hui Li, A. (2003). *Essays on the representational and derivational nature of grammar: the diversity of Wh-constructions*. Cambridge: MIT Press.

Boeckx, C. and Grohmann, K. K. (2004). Putting Phases into Perspective. Ms: University of Harvard & University of Cyprus. Available at: http://punksinscience.org/kleanthes/

Borer, H. (1986). I-subjects. *Linguistic Inquiry*, 17: 375-416.

Brody, M. (1990). Some remarks on the Focus Field in Hungarian. In *UCL Working Papers in Linguistics* 2, 201-225.

Burzio, L. (1986). *Italian Syntax.* Reidel: Dordrecht.

Chomsky, N. (1975). *The logical Structure of Linguistic Theory*. New York: Plenum Press.

Chomsky, N. (1981). *Lectures on Government and Binding*. Foris: Dordrecht

Chomsky, N. (1986a). *Barriers*. Cambridge: MIT Press.

Chomsky, N. (1986b). *Knowledge of Language*. New York: Praeger.

Chomsky, N. (1995). *The Minimalist Program*. Cambridge: MIT Press.

Chomsky, N. (2000a). Minimalist Inquiries: the framework. In R. Martin, D. Michaels, and J. Uriagereka (eds.), *Step by Step - Essays in Minimalist Syntax in honor of Howard Lansik*. Cambridge: MIT Press.

Chomsky, N (2000b). *New Horizons in the Study of Language and Mind*. Cambridge: CUP.

Chomsky, N. (2001). Derivation by Phase. In Kestowicz, M (ed.), *Ken Hale: A life in Language*. Cambridge: MIT Press.

Chomsky, N. (2004a). Beyond Explanatory Adequacy. In Belletti, A. (ed.), Structures and Beyond. The Cartography of syntactic structures (vol.3). Oxford: OUP.

Chomsky, N. (2004b). *The Generative Enterprise Revisited: discussions with Riny Huybregts, Henk van Riemsdijk, Naoki Fukui and Mihoko Zushi*. Berlin: Mouton de Gruyter.

Chomsky, N. (2005). "Three Factors in Language Design." Ms, MIT. Available at: http://ling.auf.net/lingBuzz/000100

Chomsky, N. (in press). On Phases. Ms.: To appear in C. P. Otero *et al* (eds.), *Foundational Issues in Linguistic Theory*. Cambridge: MIT Press.

Chomsky, N., A. Belletti and L. Rizzi (2002). *On Nature and Language*. Cambridge: CUP.

Fox, D. (2000). *Economy and Semantic Interpretation.* Cambridge: MIT Press.

Heageman, L. (1994). *Introduction to Government and Binding Theory*. Oxford: Blackwell.

Haegeman, L. (1995). *The Syntax of Negation*. Cambridge: CUP.

Hale, K. & S.J. Kayser (1993). On Argument structure and the Lexical Expression of Syntactic Relations. In Kenneth Hale & S. Jay Keyser (eds.), *The view from building* 20. Cambridge: MIT Press.

Hornstein, N. (1999). Movement and Control. *Linguistic Inquiry*, 30: 69-96.

Kayne, R. (1984). *Connectedness and Binary Branching*. Dordrecht : Foris,

Kayne, R. (2004). Prepositions as Probes. In A. Belletti (ed.), *The Cartography of Syntactic Structures (vol. 3)*. Oxford: OUP.

Larson, R. (1988). On the Double Object construction. *Linguistic Inquiry*, 19: 335-292.

Lasnik, H. (2001). Derivation and Representation in Modern Transformational Syntax. In Mark Baltin & Chris Collins (eds.), *The Handbook of Contemporary Syntactic Theory*. Oxford: Blackwell.

Lasnik, H. & M. Saito (1984). On the Nature of Proper Government. *Linguistic Inquiry,* 15: 235-289.

Legate, Julie Anne (2002). Phases in "Beyond Explanatory Adequacy" (Ms). Available at: http://www.ling.udel.edu/jlegate/

Legate, Julie Anne. (2003). Some Interface Properties of the Phase. *Linguistic Inquiry, 34: 506-516*. Available at: http://www.ling.udel.edu/jlegate/

Manzini, R. & A. Roussou (2000). A Minimalist Theory of A-movement and Control. *Lingua* 110, 409-447.

Manzini, R. & L. Savoia (2002). Parameters of Subject Inflection in Italian Dialects. In P. Svenonius (ed.), *Subjects, Expletives and the EPP*. Oxford: OUP.

Matushansky, O. (2004). Going Through a Phase. In McGinnis & Richards (eds.) *Proceedings of the EPP / Phase Workshop, MIT Working Papers in Linguistics*. Cambridge: MIT Press. Available at: http://mapage.noos.fr/matushansky/

McCloskey, J. (2002). Resumption, Successive Cyclicity, and the Locality of Operations. In S. D. Epstein, T. D. Seely (eds.), *Derivation and Explanation in the Minimalist Program*. Oxford: Blackwell.

McGinnis, M. & N. Richards (eds.) (2004). *Proceedings of the EPP / Phase Workshop, MIT Working Papers in Linguistics*. Cambridge: MIT Press.

Muller, G. (2003). Phrase-Impenetrability and Wh-Intervention. In A. Stepanov, G. Fanselow & R. Vogel (eds.), *Minimality Effects in Syntax*. Berlin: Mouton de Gruyter. Available at: http://www.uni-leipzig.de/~muellerg/

Nevins, A. (2004). Derivations without the Activity Condition. In McGinnis & Richards (eds.) *Proceedings of the EPP / Phase Workshop, MIT Working Papers in Linguistics*. Cambridge: MIT Press. Available at: http://ling.auf.net/lingBuzz/000149/

Perlmutter, D. (1971). *Deep and Surface Structure Constraints in Syntax*, Holt, Rinehart and Winston: New York.

Pesetsky, D. (1989). Language Particular Processes and the Earliness Principle. Paper Presented at the Glow Conference. Available at: http://web.mit.edu/linguistics/www/bibliography/pesetsky.html

Philippaki-Warburton, I. (1991). I Analisi tou Rimatikou Sinolou sta NE (The Analysis of the Verbal Complex in Modern Greek), *Studies in Greek Linguistics*, Thessaloniki, Greece, 119-138.

Pollock, J-K. (1989). Verb Movement, Universal Grammar and the structure of IP. *Linguistic Inquiry* 20: 365-424.

Rachowski, A. and N. Richards (2005). Phase edge and Extraction: a Tagalog case study. Ms, MIT. Available at: http://web.mit.edu/norvin/www/home.html

Richards, M. & M. T. Biberauer (2005). Explaining *Expl*. In Den Dikken, M. & C. Tortora (eds.), *The function of function words and functional categories.* Amsterdam: Benjamins. Available at: http://people.pwf.cam.ac.uk/mtb23/NSP/Downloadablepapers.html

Rizzi, L. (1982). *Issues in Italian Syntax*. Dordrecht: Foris.

Rizzi, L. (1990). *Relativised Minimality*. Cambridge: MIT Press.

Rizzi, L. (1997). The Fine structure of the Left Periphery. In Lilian Haegeman (ed.) *Elements of Grammar: handbook in Generative Syntax.* Dordrecht: London.

Rizzi, L. (2000). *Comparative Syntax and Language Acquisition*. Routledge: NewYork.

Rizzi, L. (2004a). Locality and Left Periphery. In A. Belletti (ed.), *The Cartography of Syntactic Structures (vol. 3)*. Oxford: OUP. Available at: http://www.ciscl.unisi.it/pubblicazioni.htm

Rizzi, L. (2004b). On the study of Language Faculty: Results, Developments, and Perspectives. *Linguistic Review*, 21: 323-344.

Rizzi, L. (in press). On the form of Chains: Criterial positions and ECP effects. Ms.: To appear in Cheng and Corver (eds.), *Wh-movement on the move*. Cabridge: MIT Press. Available at: http://www.ciscl.unisi.it/pubblicazioni.htm

Roberts, I. & A. Roussou (2002). The EPP as a Condition on the Tense Dependency. In P. Svenonius (ed.), *Subjects, Expletives and the EPP*. Oxford: OUP. Available at: http://kiri.ling.cam.ac.uk/roberts/

Roussou, A. (2002). C, T, and the subject: "That-t" phenomena revisited. *Lingua* 112, 13-52

Safir, K. (1985). *Syntactic Chains*. Cambridge: CUP.

Simpson, A. (2000). *Wh-Movement and the Theory of Feature-Checking*. John Benjamin's Publishing: Amsterdam.

Svenonius, P. (2003). On the Edge. Ms., University of Tromsø. Available at: http://ling.auf.net/lingBuzz/000008.

Taraldsen, K. (1978). On the NIC, Vacuous Application and the "that-trace" filter. Ms, MIT.

Williams, E. (2003). *Representation Theory*. Cambridge: MIT Press.