

On the Criterial Position*
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Abstract

Contrary to Chomsky' (2015) account in terms of Labeling Algorithm, I show that the Halting Problem, (the violation of) the Empty Category Principle and the Extended Projection Principle are given a unified account in terms of feature valuation, with the interface with phonology taken into consideration. A raised category must stop in the position where it completes the valuation of all of its own unvalued features, which corresponds to the Criterial Position. In the Halting Problem, a *wh*-object agrees with the embedded C that has Q and is frozen in that Spec. In the Empty Category Principle, a *wh*-subject should in principle move across a declarative complementizer, since Agree does not occur between the *wh*-subject and the embedded C that does not have Q. The violation of the Empty Category Principle is not idiosyncratic any longer, with the *that*-trace effect attributed to the matter of phonology. In the Extended Projection Principle, a subject must move to [Spec,TP] to value its own unvalued Case feature, since the latter cannot be valued by v*. With the subject located in [Spec,TP] both in English and in Italian, whether an overt subject is required or not is attributed to the requirement from the phonological component. I argue that this unified account derives from one of the corollaries of the derivational system based on Labeling Algorithm: labeling results from feature valuation in crucial cases.

1. Introduction

A sentential element cannot move up further from some structural positions, the problem called the Halting Problem (HP). In (1a), the *wh*-object *which dog* moves from its original position to [Spec,(embedded)CP] and must stop there. It cannot move up to [Spec,(matrix)CP]; see (1b).

- (1) a. You wonder [_{QP} [Q *which dog*] C_Q John likes ~~[_Q *which dog*]].
b. *[Q *which dog*] do you wonder [_{QP} ~~[_Q *which dog*]] C_Q John likes ~~[_Q *which dog*]]?~~~~~~

Rizzi (2006, 2010, 2015) accounts for the HP in terms of Criterial Freezing. A head and the sentential element located in its Spec enter a structural, criterial relation; the interpretation of the latter is determined by the feature of the head, e.g. Foc(us), Top(ic), etc. In (1a), the embedded C has Q. The *wh*-object *which dog*, which moves to its Spec, enters the Q-criterial relation with the embedded C and receives the interpretation as a *wh*-operator. It must stop there,

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as illustrated in (1b), in which further movement of the *wh*-phrase to the matrix Spec makes the sentence ungrammatical. Such positions as [Spec,(embedded)CP] in which a sentential element enters a criterial relation with a head and cannot move up further are called the Criterial Position (CriP).

Within the new derivational framework, Labeling Algorithm (LA), Chomsky (2013, 2015) discusses, in addition to the HP, (the violation of) the Empty Category Principle (ECP) and the Extended Projection Principle (EPP). In the ECP illustrated in (2a), the *wh*-subject *who* cannot move up across the overt complementizer *that*, which has been referred to as the *that*-trace effect (Chomsky 1981, 1986). When the complementizer disappears as in (2b), the ECP can be violated and the *wh*-subject can exceptionally move up to sentence-initial position.

- (2) a. *Who do you think that [~~who~~ read the book]?
 b. Who do you think Ø [~~who~~ read the book]?

The EPP is typically illustrated by the requirement of an overt subject in [Spec,TP] in languages such as English:

- (3) *(John) kissed Mary.

Chomsky (2015) claims that the problem arising from the HP (1a-b) differs from that arising from (the violation of) the ECP (2a-b) and the EPP (3), associating the latter two. Languages such as English have the EPP requirement and obey the ECP, whereas languages such as Italian neither have the EPP requirement nor obey the ECP. The ECP violation of English illustrated in (2b) is thus idiosyncratic.

In this paper, I show that the HP, (the violation of) the ECP and the EPP are given a unified account in terms of feature valuation, quite a familiar syntactic operation, with the interface with phonology taken into consideration. I argue that a raised category must stop in the position where it completes the valuation of all of its own unvalued features, which corresponds to the CriP. In the HP, a *wh*-object agrees with the embedded C that has Q and is frozen in that Spec. Concerning the ECP, a *wh*-subject should in principle move across a declarative complementizer, since Agree does not occur between the *wh*-subject and the embedded C that does not have Q. The ECP violation is not idiosyncratic any longer, with the *that*-trace effect attributed to the matter of phonology. Regarding the EPP, a subject must move to [Spec,TP] to value its own unvalued Case feature, since the latter cannot be valued by v*. With the subject located in [Spec,TP] both in English and in Italian, whether an overt subject is required or not is attributed to the requirement from the phonological component. I argue that this unified account derives from one of the corollaries of the LA derivational system: labeling results from feature valuation in crucial cases.

This paper is organized as follows. Section 2 introduces the LA procedures proposed by Chomsky (2013, 2015). Section 3 introduces Chomsky's account for the HP, (the violation of) the ECP and the EPP on the basis of LA. In Section 4, I show that the HP, (the violation of)

the ECP and the EPP are provided a unified account in terms of feature valuation, with the interface with phonology taken into consideration. Section 5 briefly concludes this paper. Throughout this paper, I assume that the reader is familiar with the theoretical development from Chomsky (2000) and onwards.

2. The procedures of LA

Chomsky (2013, 2015) claims that the type of projections is not determined in an automatically endocentric manner. In the tradition since the X-bar theory within the Principles and Parameters framework (Chomsky 1981, 1986, 1995), endocentricity in which a head automatically projects has long been assumed. On the contrary, Chomsky (2013, 2015) claims that the type of projections does not need to be determined in the course of derivations. Information on the projection type of a syntactic object (SO) is necessary only at the interfaces, where that SO is assigned some interpretation. According to Chomsky, such information is provided by LA, which applies at phase levels at which SOs are sent to the interfaces. The following LA procedures are proposed:¹

- (4) a. In the configuration [H, XP], with H being a phase head, LA takes H as the label;
- b. In the configuration [XP, YP], either of the following procedures is chosen:
 - i) Either XP or YP moves out; LA takes the head of the phrasal object that does not move out as the label;
 - ii) XP and YP agree in some feature(s); LA takes the shared feature(s) as the label;
- c. In the configuration [H, XP] with H being a non-phase head, i.e. R(oot) or T,
 - i) A non-phase head raises some category in XP to [Spec, H] and;
 - ii) That raised category and the non-phase head agree in some feature(s); LA takes the shared feature(s) as the label.

When a SO consists of a phase head and XP, LA automatically takes the head as the label (4a).

When a SO consists of XP and YP, neither of which is a head, the first procedure (4bi) is that either XP or YP moves out of the configuration [XP, YP]. After, e.g. XP, moves out, XP is invisible in the original position. LA takes the head of YP as the label, which results in: [XP _{$\alpha(=YP)$} ~~XP~~, YP]. In the second procedure (4bii), XP and YP do not move; they agree in some feature(s), e.g. in ϕ -features. The agreement procedure in (4bii) (and also in (4cii)) is the syntactic operation that has been called *Agree* or feature valuation (Chomsky 2000, 2001, 2004, 2008).² LA takes the shared feature(s) as the label, which results in, e.g. [_{$\alpha(=\phi, \varphi)$} XP, YP].

R(oot) in (4c) means a verbal root. Following Borer (2005a,b, 2013), Chomsky (2013, 2015) assumes that any category (noun, verb, etc.) is created by merge of a root and a functional

¹ According to Chomsky, LA is not the kind of syntactic operations, but an abstract (syntactic) mechanism. I follow him in this point, and I use the term *label(ing)* when I mean an actual operation to label a SO.

² In both configurations, [H,XP] and [XP,YP], *Agree* occurs between two heads, H and X in the former and X and Y in the latter. See the series of Chomsky's papers given above.

head.³ To be a verbal category, R moves and merges to v^* . According to Chomsky (2015:9-10), the non-phase heads, R and T, are weak and cannot be labels by themselves. When a SO consists of such a weak, non-phase head and an XP, the weak head raises some category in that XP to its own Spec, as described in (4ci). The head can strengthen itself and label its own projection with help of that raised category. The requirement that a non-phase head raises some category in its complement to its own Spec to label itself is referred to as the EPP (Chomsky 2015:10).

For Agree to occur between a non-phase head and the category raised to its Spec, the former must inherit phasehood from the phase head that selects it. According to Chomsky (2015:11), the phase head C has functional features such as ϕ -features and tense (and also Q, if any). They are inherited from C to the non-phase head T, which means the inheritance of phasehood from C to T. T and the category raised to its Spec agree in some feature(s), e.g. in ϕ -features. LA takes the shared features as the label: e.g. [$\alpha(=\phi, \phi)$ DP [T [~~DP~~ ...]]]; see (4cii). The same procedure of feature inheritance applies to the relation between v^* and R, too. In this paper, I use the following notations of projections for the ease of explanation. I notate VP as RP. v^* P and TP are notated as they have been, following the tradition. For clausal projections, I notate the label as CP when C is declarative, and as QP when C is interrogative regardless of whether it is *yes-no/if* or *wh*.⁴

After labeling, *Transfer* (or *Spell-Out* in the traditional term) applies. It has been assumed that the complement of a phase head is spelled out, with that phase head and the category in its Spec being at the edges and accessible to further syntactic operations (the *Phase Impenetrability Condition*, Chomsky 2001). In the LA system, it is also assumed that Transfer applies to the complement of a non-phase head that has inherited phasehood (Chomsky 2015:11). In the v^* P phase, phasehood is inherited from v^* to R. R labels its own projection after Agree with the category raised in its Spec. v^* is an affix and invisible to LA, so it must be deleted (Chomsky 2015:12). After R moves to v^* and the latter is deleted, phasehood is activated in the original position of R. The complement of R is transferred. The same procedure applies in the CP phase: phasehood is inherited from C to T and activated in T (Chomsky 2015:14).

On the basis of the procedures above, the derivation of *John loves Mary* proceeds as illustrated in (5), which is the final representation of the derivation.

- (5) [$\alpha(=CP)$ C [$\beta(=TP)$ John [T [$\gamma(=v^*P)$ ~~John~~ [$\text{love}(=R)+v^*$ [$\delta(=RP)$ Mary [~~$\text{love}(=R)$~~ [ϵ ~~Mary~~]]]]]]]]]

The verbal root R *love* and its internal argument *Mary* merge. Since R is a non-phase head and weak by assumption, its complement *Mary* moves to [Spec,R] to strengthen it. The phase head v^* merges to its complement, δ . Phasehood is inherited from v^* to R, i.e., the functional features in v^* are inherited to *love*(=R). *Love*(=R) and *Mary* in its Spec Obj(ect)-agree and the latter is

³ This idea has been already proposed in the framework of Distributed Morphology. See, e.g. Marantz (1997).

⁴ The distinction between *yes-no* interrogatives (including embedded *if*-clauses) and *wh*-interrogatives is irrelevant in this paper, though they are distinguished in Chomsky (2013, 2015).

assigned Acc(usative Case). δ is labeled RP. *Love*(=R) then moves to v^* to be a verbal category. v^* is an affix and invisible to LA; so, it is deleted. Phasehood is activated in the original position of R. ε , the complement of R, is transferred. (Hereafter, I leave aside the details of the derivation and labeling process of RP.)

The external argument of v^* *John* merges to the SO that has been already built; T also merges to that resulting SO, γ . Since T is a non-phase head and weak by assumption, DP in its complement, i.e. *John* in [Spec, γ], moves to the Spec of T to strengthen it.⁵ The phase head C merges to its complement, β . Phasehood is inherited from C to T, i.e., the functional features in C are inherited to T. T and *John* in its Spec Subj(ect)-agree and the latter is assigned Nom(inative Case). β is labeled TP. Phasehood is activated in T. γ (= v^* P), the complement of T, is transferred. Since C is a phase head, the matrix projection α is labeled CP, according to (4a). The entire structure, α (=CP) (including β (=TP)), is transferred.

3 . The derivations of the HP, the ECP (violation) and the EPP on the basis of LA

Chomsky (2015) accounts for the HP, (the violation of) the ECP and the EPP in terms of LA. The HP illustrated in (1b), which is repeated in (6), is claimed to arise since labeling cannot be done. At phase α , *which dog* and C are at the edge. α remains to be labeled at this derivational stage. After *which dog* moves out of [Spec, α], it is invisible in that position. Since *which dog* and C_Q cannot agree, the former being invisible, α cannot be labeled, which makes the sentence ungrammatical.

(6) * $[_Q \text{ which dog}]$ do you wonder $[_\alpha \text{ ~~[_Q \text{ which dog}]}~~$ C_Q John likes $[_Q \text{ which dog}]]$? (=1b)

On the other hand, the ECP illustrated in (2) is associated with the EPP: it is claimed that they both concern the requirement of an overt subject in [Spec,TP]. Italian allows [Spec,TP] to be empty as in (7a). The *wh*-subject *chi* ‘who’ can move to the Spec of the matrix CP across the overt complementizer *che* ‘that’ of the embedded CP; see (7b). In English, [Spec,TP] must be overtly filled as in (8a). The *wh*-subject *who* cannot move to the Spec of the matrix CP across the overt complementizer *that* of the embedded CP; see (8b). Thus, Italian neither has the EPP requirement nor obeys the ECP as illustrated in (7a-b), whereas English both has the EPP requirement and obeys the ECP as illustrated in (8a-b). In English, the *wh*-subject can exceptionally move, when the complementizer of the embedded CP disappears; see (8c). The violation of the ECP in English is idiosyncratic, according to Chomsky (2015:10).

(7) a. (Gianni) vincerà. [Italian]
Gianni win-FUT-3sg
‘Gianni will win.’

⁵ After *John* moves out, γ is labeled v^* P; see (4bi).

- b. Chi credi [CP che [_α(=TP) ~~chi~~ vincerà+T [_β(=v*P) ~~chi~~ vincerà]]]?
 who think-PRES-2sg that win-FUT-3sg
 ‘Who do you think that will win?’

- (8) a. *(John) read a book.
 b. *Who do you think [CP that [_α ~~who~~ T [_β(=v*P) ~~who~~ read the book]]]?
 c. Who do you think [CP Ø [_α ~~who~~ T [_β(=v*P) ~~who~~ read the book]]]?

Within the framework of LA, Chomsky (2015:9) attributes the difference between Italian and English to the strength of T. Based on his claim, the cases of Italian and those of English are accounted for as follows. Thanks to its quite a rich inflectional system, as shown by the verbal form *vincerà*, which inflects for future tense and the third person singular, Italian has a strong T, which can label itself. It does not need an overt subject in its Spec to strengthen itself, as illustrated in (7a). In the same way, when the *wh*-subject *chi* moves out as illustrated in (7b), the strong T can label itself, with α labeled TP (, regardless of the presence of the overt complementizer *che* of the embedded CP).

On the other hand, due to its poor inflectional system, as shown by the verbal form *read*, which inflects neither for tense nor for person,⁶ English has a weak T, which cannot label itself. It needs an overt subject in its Spec to strengthen itself; see (8a). When the *wh*-subject *who* moves to the Spec of the matrix CP, the copy in [Spec, α] is invisible and cannot agree with T. The weak T cannot label itself, i.e., α cannot be labeled, which makes (8b) ungrammatical.

In the idiosyncratic case (8c), it is claimed that when the complementizer *that* disappears, phasehood is activated in T and its complement is transferred (Chomsky 2015:11).⁷ Specifically, phasehood is inherited from the embedded C to T and activated in T. After the complementizer disappears, the complement of T, i.e. β (=v*P), is transferred. The *wh*-subject, which is in [Spec, α], i.e. at the edge, can access the syntactic operations carried out in the matrix phase and move up to sentence-initial position.⁸

4. Feature valuation

In this section, I show that, with the interface with phonology taken into consideration, the HP, (the violation of) the ECP and the EPP are all provided a unified account in terms of *feature valuation* (or Agree), which is quite a familiar syntactic operation.⁹ It has been assumed that in

⁶ The pronunciation differs between the present tense and the past tense, which is irrelevant here.

⁷ Though, it is assumed, the embedded clause maintains the label of CP.

⁸ The *parallel movement* analysis of *wh*-subjects (Chomsky 2008) cannot be maintained in the LA system, which I turn to later.

⁹ There has been much literature on the agreement system. Regarding the TP system, see, e.g. Chomsky (1981, 1986, 1995), Rizzi (1982, 1986), Pollock (1989), Jaeggli and Safir (1989), Brandi and Cordin (1989), Holmberg and Platzack (1995), Sigurðsson (1996, 2004, 2009), Lambrecht and Polinsky (1997), Van Gelderen (1997), Alexiadou and Anagnostopoulou (1998), Pesetsky and Torrego (2001), Belletti (2001), Manzini and Savoia (2002), Baker (2003), Siewierska (2004), Corbett (2006), Costa and Silva (2006), among others. See also the recent literature, e.g. Carstens and Diercks (2013), for a discussion of hyper-raising. Regarding the v*P system, see, e.g. Déprez 1998, for data on past participle agreement in French. For the CP system, i.e. complementizer agreement, see, e.g. Haegeman (1990), Zwart (1993), Chung (1998), Baker (2003, 2008), Carstens (2005, 2011), Van Koppen

this operation, a head that has unvalued features probes a nominal with the valued counterparts as its goal, and that the features of the former are valued by the latter (Chomsky 2000, 2001, 2004, 2008). In this perspective, Agree is a unilateral operation in that it is only a head that seeks a nominal as its goal.¹⁰

It is not always a head that has unvalued features, however: a nominal can also have unvalued features. When a head has unvalued features, it probes a nominal with the valued counterparts as its goal, and its unvalued features are valued by the latter. In the same way, when a nominal has unvalued features, it should seek a head with the valued counterparts, with its unvalued features valued by the latter. As we saw in section 2, the unvalued Case of a DP is valued by R/T and assigned either Acc or Nom depending on the head which the DP agrees with.¹¹ Hence, feature valuation should be bilateral between the categories, a head and a nominal (or any other category), that enter this syntactic operation. I formulate feature valuation as follows:¹²

(9) *Feature Valuation:*

The syntactic operation in which the unvalued feature(s) of one of the categories is valued by the valued counterpart(s) of the other.

Let us consider the properties of the CriP in detail from the point of view of feature valuation. In *wh*-movement, Chomsky (2015:13,ft.16) assumes that C has a valued Q-feature, which agrees with unvalued features of a *wh*-phrase. In this paper, I represent the unvalued features of a *wh*-phrase as *Q/wh*.¹³ (10) (=6) below illustrates the HP, which is the final representation of the derivation.

(10) *_[α] [_Q which dog] do [_{β(=TP)} you wonder [_{γ(=QP)} ~~{_Q which dog~~] C_Q [John likes ~~{_Q which dog~~}]]]]?

After the *wh*-object *which dog* Obj-agrees with the embedded verbal head *likes*, it is assigned Acc. It still has unvalued *Q/wh*-features and moves to [_{Spec,γ}]. Since the verb *wonder* subcategorizes a *wh*-clause, the embedded C has Q. The *wh*-object in [_{Spec,γ}] agrees with C_Q. γ is labeled QP. In [_{Spec,γ}], the *wh*-object completes the valuation of its own unvalued features. It is frozen there and cannot move up further to [_{Spec,α}].

That is, the CriP, i.e. [_{Spec,γ}] in (10), is the position in which the *wh*-object *completes the valuation of all of its own unvalued features*. In other words, a category must stop in the

(2012), among others.

¹⁰ See Béjar and Rezac (2009) for an argument on Agree from this standpoint. In the probe-goal system (Chomsky 2000), Agree was an independent syntactic operation that proceeds along with its own needs: a head simply searched a goal to value its unvalued features. Contrary to the probe-goal system, Agree is considered to be part of labeling in the LA-based derivational system; see (4bii) and (4cii).

¹¹ See also Pesetsky and Torrego (2001), who argue that the unvalued Case feature of a nominal subject is valued by the tense feature of T.

¹² Recently, a debate occurs on whether Agree should be downward or upward (e.g. Zeijlstra 2012, Preminger 2013). From the standpoint here, the directionality of agreement can be both downward and upward. That is, a head with unvalued φ-features seeks its goal downward; a DP with an unvalued Case seeks its goal upward.

¹³ I leave aside the internal structure of *wh*-phrases. See Cable (2010) for a detailed discussion of that issue.

position where all of its unvalued features are valued.

Consider the ECP. Italian can violate it, but English must obey it; see (7-8b). The ECP can be exceptionally violated in English when the complementizer disappears; see (8c). Since Chomsky (2008), the *parallel movement* analysis of *wh*-subjects has been assumed: a *wh*-subject simultaneously moves from [Spec,v*P] to [Spec,TP] on one hand and from [Spec,v*P] to [Spec, CP] on the other in a parallel manner. According to this analysis, the *wh*-subject *chi/who* in (7b) and (8b-c) moves from [Spec,β(=v*P)] to [Spec,α(=TP)] on one hand, and from [Spec,β(=v*P)] to the embedded Spec on the other.

Note that the parallel movement analysis of *wh*-subjects is no longer tenable in Chomsky's account in terms of LA, which was introduced in the previous section, regardless of whether the overt complementizer appears or not. In (7-8b) and (8c), after phasehood inherited from the embedded C to T is activated in T, its complement, i.e. β(=v*P), is transferred. After it is transferred, the *wh*-subject in [Spec,v*P] cannot move up further.

However, the parallel movement analysis must be maintained to label the matrix clause of *wh*-subject interrogatives. Consider the following simple case:

- (11) a. [_{α(=CP)} C_[Q,φ] [_{β(=QP)} *who* T_[Q,φ] [_{γ(=v*P)} ~~*who*~~ left]]]?
 b. [_{α(=QP)} *who* C_[Q,φ] [_{β(=TP)} ~~*who*~~ T_[φ] [_{γ(=v*P)} ~~*who*~~ left]]]?

If Q were inherited from C to T in addition to φ-features as illustrated in (11a), unvalued Q/*wh*-features of *who* would be valued by T (and its Case is also assigned Nom).¹⁴ But since C does not have Q any longer, the matrix clause is labeled CP, i.e. a declarative clause, which leads to a gibberish expression. Thus, Q must not be inherited from C to T. In (11b), in which only φ-features are inherited to T with Q remaining in C, *who* with unvalued Q/*wh*-features moves to the Spec of C_Q, i.e. [Spec, α], and agrees with C_Q; α is labeled QP.¹⁵

With the parallel movement analysis, the derivation of the ECP proceeds as illustrated in (12a-c), which are the final representations.

- (12) a. [_{α(=QP)} *chi* C_Q [_{β(=TP)} *credi* [_{γ(=CP)} ~~*chi*~~ *che* [_{δ(=TP)} ~~*chi*~~ [_{ε(=v*P)} ~~*chi*~~ *vincerà*]]]]]]]?¹⁶
 b. * [_{α(=QP)} *who* do+C_Q [_{β(=TP)} *you think* [_{γ(=CP)} ~~*who*~~ *that* [_{δ(=TP)} ~~*who*~~ [T [_{ε(=v*P)} ~~*who*~~ *read the book*]]]]]]]?
 c. [_{α(=QP)} *who* do+C_Q [_{β(=TP)} *you think* [_{γ(=CP)} ~~*who*~~ ∅ [_{δ(=TP)} ~~*who*~~ [T [_{ε(=v*P)} ~~*who*~~ *read the book*]]]]]]]?

The *wh*-subject *chi/who* moves from [Spec, ε] to [Spec, δ] on one hand, and from [Spec, ε] to [Spec, γ] on the other. It is assigned Nom in [Spec, δ] in Agree with T but still has unvalued

¹⁴ I thank Hisatsugu Kitahara for suggesting this point to me (p.c.).

¹⁵ The argument here indicates that feature inheritance must be constrained. As introduced in section 2, Chomsky (2015:11) claims that the phase head C has functional features including Q, if any, and they are all inherited to T. But if Q were inherited from C to T, the matrix clause could not be labeled; see (11a). The same argument also applies to the HP as illustrated in (10): if Q were inherited from the embedded C to the embedded T, the embedded C which does not have Q any longer would not agree with the *wh*-object *which dog*, and the latter could move up. How and to what extent feature inheritance should be constrained, I leave for future research.

¹⁶ It has been traditionally claimed that a main verb moves to T in the Romance languages (e.g. Emonds 1978, Pollock 1989, Chomsky 1995), which is illustrated in (12a) but irrelevant here.

Q/*wh*-features in [Spec, γ]. Since the verb *credi/think* subcategorizes a *che/that*-clause, the embedded C does not have Q that can be shared by the *wh*-subject. Agree does not occur between the embedded C and *chi/who* in [Spec, γ]. The *wh*-subject with unvalued Q/*wh*-features continues to move up to the matrix Spec.¹⁷ In [Spec, α], it agrees with the matrix C_Q and its unvalued features are valued. Completing the valuation of all of its own unvalued features, the *wh*-subject stops there.

The point is that a *wh*-subject should in principle move across a declarative complementizer, regardless of whether the latter is overt or not. Since Agree does not occur between the embedded C without Q and the *wh*-subject in [Spec, γ], the latter, still having unvalued Q/*wh*-features, continues to move up to [Spec, α], where its unvalued features are valued by the matrix C_Q.¹⁸ Recall the traditional claim (Huang 1982) that when a *wh*-phrase is extracted from the object position, the complementizer can appear overtly; see (13a). (13b) is the final representation of the derivation.¹⁹ In the same way as *wh*-subjects, the *wh*-object in [Spec, γ] does not agree with the embedded C without Q. It still has unvalued Q/*wh*-features and continues to move up to [Spec, α]. It stops there, completing the valuation of all of its own unvalued features. The derivation is licit, whether the complementizer appears overtly or not.

- (13) a. Who do you think (that) John loves?
 b. [_{α} (=QP) who do+C_Q [_{β} (=TP) you think [_{γ} (=CP) ~~who~~ (that) [_{δ} (=TP) John [T [_{ε} (=v*P) ~~John~~ loves ~~who~~]]]]]]?

Thus, the *that*-trace effect in English is not idiosyncratic as claimed by Chomsky (2015), since it is not derived from any constraints in syntax. It is plausible that the *that*-trace effect is derived from some constraints in the phonological component that prevent the complementizer *that* from appearing overtly in the extraction of *wh*-subjects, which I leave for future research.^{20,21}

¹⁷ δ is labeled TP, after *who* in [Spec, δ] and the embedded T agree. γ is labeled CP, after the *wh*-subject moves out of [Spec, γ]; see (4bi). α is labeled QP, after *who* in [Spec, α] agrees with the matrix C_Q.

¹⁸ The same argument applies to the v*P phase (Chomsky 2015:10,(3')):

i) [_{α} who do you [_{β} v* [_{γ} ~~who~~ expect [_{δ} to win]]]]?

Since the verbal root *expect* does not have Q, unvalued Q/*wh*-features of *who* are not valued in [Spec, γ]. The *wh*-phrase continues to move up. In the highest Spec, [Spec, α], those unvalued features are valued by the matrix C_Q and *who* stops there.

¹⁹ I omit the details of intermediate positions such as [Spec, v*P] which the *wh*-object passes through. The *wh*-object is assigned Acc in Agree with the verbal root, which procedure is also omitted.

²⁰ Some literature discusses the (im-)possible presence of an overt complementizer of embedded clauses from the phonological perspective. An (2007) proposes a generalization that ‘if a clause is obligatorily parsed as a separate I-phrase (i.e., if a clause appears in a noncanonical position), the specifier and the head of the clause cannot both be null’ (An 2007:59,(50)). Though referred to in An (2007:71,ft.58), the *that*-trace effect in English is an argument against that generalization: the *that*-trace effect is avoided by deleting both the embedded C head and its specifier. Kandybowicz (2009) claims, based on the data of the *that*-trace effect in Nupe, that there is a phonological boundary between a full-form complementizer and its complement, but not one between a reduced complementizer and its complement. It is unclear whether the same condition applies to English.

²¹ Irish has two kinds of complementizer for intermediate positions, one for declarative complement clauses, which is represented as *go*, and the other for intermediate complementizer positions in successive cyclic *wh*-movement, which is represented as *aL/aN*. In the latter case, all C heads, including the matrix one and intermediate ones, normally appear as the *aL/aN* form:

i) Cé aL mheas tú aL chonaic tú? [Irish]
 who C thought you C saw you
 ‘Who did you think you saw?’

Finally, let us consider the EPP. Italian does not have the EPP requirement and allows [Spec,TP] to be empty as in (14a) (=7a). English has the EPP requirement, and [Spec,TP] must be overtly filled as in (14b) (=8a). (14a-b) are the final representations of the derivation. Both in Italian and in English, the Case feature of the subject is unvalued in [Spec, γ], since it cannot be valued by v^* . The subject moves out, and γ is labeled v^*P . In [Spec, β], the subject agrees with T, with β labeled TP. The subject is assigned Nom and stops there.²²

- (14) a. [α (=CP) C [β (=TP) (Gianni) [vincerà+ v^* +T [γ (= v^*P) ~~Gianni~~ ~~vincerà~~]]]].
 b. [α (=CP) C [β (=TP) *(John) [T [γ (= v^*P) ~~John~~ read a book]]]].

As we saw in section 3, it is claimed that the English T is weak and raises a subject to its Spec to label itself, whereas the Italian T is strong and can label itself without help of a subject (Chomsky 2015). However, the subject in fact must move to [Spec,TP] to value its own unvalued Case feature both in English and Italian, since its Case cannot be valued by v^* . In [Spec,TP], the subject is assigned Nom by T. It completes the valuation of all of its unvalued features and stops there. Thus, the subject should be in [Spec,TP] in syntax in all languages to be assigned Nom. It is plausible that the difference in whether an overt subject is required or can be omitted is attributed to the properties of the phonological component in relevant languages. See, e.g. Holmberg (2000), who convincingly argues that the EPP derives from the phonological requirement that an overt category must fill [Spec,TP] in some languages.²³

On the basis of the argument here, the subject must move to [Spec,TP] to be assigned Nom, even when it appears to stay in situ, i.e. even in *there*-constructions. In (15a), the subject *a man* appears in [Spec,TP]. In (15b), the subject appears in the original position, with the expletive *there* inserted into [Spec,TP]. As illustrated in (16-17a), the subject moves to [Spec,TP] and is assigned Nom by T in both cases; the SO is then transferred. As has been claimed since Groat and O’Neil (1996), it is a matter of phonology which copy of a moved category, the one in the highest position or the one in the original position, is pronounced. In (15a), the highest copy of the subject is pronounced, with the copy in the original position deleted, as illustrated in (16b). In (15b), the copy in the original position is pronounced. According to De Vos (2009), the expletive *there* is a phonological filler which is inserted after Spell-Out. Let us assume that *there* has only phonological features and is inserted into

(McCloskey 1979:52,(3a))

On the basis of our argument that a *wh*-phrase moves up to the highest Spec since it does not agree with the embedded C, intermediate C heads should appear as the *go* form. According to McCloskey (2002), there is in fact dialectal variation among Irish varieties concerning which form is used.

Also note, regarding the CP system, that contrary to ϕ -features in T, which are unvalued, the Q-feature of C is valued: it values unvalued Q/*wh*-features of a *wh*-phrase. That is, complementizer agreement is the realization of the interpretable feature in C. See, e.g. Baker (2008), who shows that complementizer agreement in the matrix C appears as the realization of the interpretable focus feature in Ibibio, and Polinsky and Potsdam (2001), who show that complementizer agreement in the embedded C appears as the realization of the interpretable topic feature in Tsez.

²² α is labeled CP, based on (4a). In (14a), the main verb *vincerà* moves to T, which is irrelevant here.

²³ Morphological richness is irrelevant to whether or not individual languages have the EPP requirement and obey the ECP, contrary to Chomsky’s claim. See, e.g. Sigurðsson (2004, 2009) and Bobaljik (2006), who claim that actual morphological realization is confined to the phonological component.

[Spec,TP] in the phonological component after the highest copy of the subject is deleted.²⁴ Nom that has been assigned in [Spec,TP] is not deleted but should be transmitted to the copy in the original position (cf. Baker 2015);²⁵ see (17b).²⁶

- (15) a. A man is in the garden.
b. There is a man in the garden.
- (16) a. [_α(=CP) C [_β(=TP) a man_[Nom] [is+T [_γ(=vP) a man ~~is~~ ...]]]] → Transfer
b. [_α(=CP) C [_β(=TP) a man_[Nom] [is+T [_γ(=vP) ~~a man~~ is ...]]]] → Deletion of the original copy
- (17) a. [_α(=CP) C [_β(=TP) a man_[Nom] [is+T [_γ(=vP) a man ~~is~~ ...]]]] → Transfer
b. [_α(=CP) C [_β(=TP) ~~a man~~_[Nom] [is+T [_γ(=vP) a man_[Nom] is ...]]]]
↑
there
→ Deletion of the highest copy and *there*-insertion

In sum, a category must stop in the position where it completes the valuation of all of its own unvalued features, which corresponds to the CriP. In terms of feature valuation, the HP, (the violation of) the ECP and the EPP are given a unified account, with the interface with phonology taken into consideration.

This unified account derives from one of the corollaries of the LA derivational system: *labeling results from feature valuation* in all the cases except when LA takes a phasal head as the label as described in (4a).²⁷ In the HP (10), the embedded clause γ is labeled QP, since the *wh*-object in [Spec, γ] agrees with C_Q, which prevents the *wh*-object from moving up further. In (the violation of) the ECP (12), the *wh*-subject in [Spec, γ] should move up, since it does not agree with the embedded C of the complement of the verb *credi/think*, which subcategorizes a *che/that*-clause. After the *wh*-subject in [Spec, α] agrees with the matrix C_Q, α is labeled QP. In the EPP (14), the subject moves to [Spec, β] and agrees with T, after which β is labeled TP.

That labeling results from feature valuation further derives from one of the theoretical consequences of the currently assumed syntactic mechanism: only the categories with unvalued features can move out, while those without them cannot move. Chomsky claims that something

²⁴ I do not assume here that the expletive is included in the numeration of (15b). I do not assume either that the expletive has any syntactic features such as Case and ϕ -features, contrary to much literature on expletive constructions (Chomsky 1981, 1986, 1995, 2000; Rizzi 1982; Safir 1982; Williams 1984; Belletti 1988; Lasnik 1992, 1999; Martin 1999; Groat 1999; Moro 2000; Epstein and Seely 2006, among others).

²⁵ Either in syntax before Transfer or in phonology when the highest copy is deleted, which details I leave for future. See Baker (2015), who discusses Case inheritance within a Case chain.

²⁶ The argument here can also apply to the Italian postverbal subject. Italian allows both a preverbal and postverbal subject:

i) a. Gianni vincerà. ('Gianni will win.') (=7a)
b. Vincerà Gianni. ('Gianni will win.')

In this case, the subject moves from the postverbal position (ib) to [Spec,TP] (ia) and is assigned Nom. Which copy of the subject, the one in the highest position or the one in the original position, is pronounced is a matter of phonology.

²⁷ As stated at the beginning of section 2, Chomsky (2013, 2015) discards the endocentric property of heads, claiming that labels are necessary only for the interpretation at the interfaces. But (4a) is actually a stipulation and does not seem to have a universal property.

moves out to label a projection as described in (4bi) and (4ci). But it is not the case that any category can move out. In the HP (10), the *wh*-object which completes the valuation of its own unvalued features in [Spec, γ] cannot move up further. If it moved to the matrix Spec, the entire sentence would be ungrammatical as illustrated in (10). In (the violation of) the ECP (12), the *wh*-subject in [Spec, γ] should move up, since it has unvalued Q/*wh*-features and they are not valued by the embedded C of the *che/that*-clause, which does not have Q. In the EPP (14), the subject must move out of [Spec, γ], since it has an unvalued Case and the latter cannot be valued by v^* . It moves to [Spec, β], where it is assigned Nom and completes the valuation of all of its unvalued features.

The argument above answers the question Chomsky (2013:36,ft.36) addresses: why is it always a subject, not v^*P , that moves out? The reason is that v^*P does not have any unvalued features, contrary to the subject. That is, the subject must move out of [Spec, v^*P], since its unvalued Case cannot be valued by v^* ; it moves to [Spec,TP] and is assigned Nom. On the other hand, v^*P does not have any unvalued features in the unmarked case; it thus cannot move out. The same argument also applies to adverbials, which do not have unvalued features in the unmarked case and do not move out.

From the argument here, it is predicted that a category will continue to move, as long as it keeps some unvalued features. As illustrated in (the violation of) the ECP (12), the *wh*-subject Subj-agrees with the embedded T and is assigned Nom. But it still has unvalued Q/*wh*-features, which cannot be valued by the embedded C. Thus, it should move up to the highest Spec, where those unvalued features are valued by the matrix C_Q . This argument applies to all intermediate Spec positions. A *wh*-object, for instance, is assigned Acc in Agree with a verbal head but still has unvalued Q/*wh*-features. It moves to [Spec, v^*P] (Chomsky 2000), but those unvalued features cannot be valued by v^* . It continues to move up to the highest Spec, where they are valued by the matrix C_Q (cf. (13)).²⁸

Finally, I mention two proposals that are similar to the argument here. Bošković (2007, 2008) claims that feature checking of a moved category drives syntactic movement. He argues that when a raised category checks its unchecked features, it stops there. The argument here differs from his claim crucially in the following three points. First, he does not make use of the copy deletion strategy. Thus, a lot of assumptions are necessary to account for *there*-constructions. Secondly, he claims that feature checking does not occur between a head and a raised *wh*-phrase in intermediate positions such as [Spec,(embedded)CP], and the *wh*-phrase must continue to move. On the basis of his account, the HP illustrated in (1a-b), in which the *wh*-phrase is frozen in the intermediate Spec, cannot be accounted for. Thirdly, the *that*-trace effect cannot be accounted for in his system either. By saying that a *wh*-phrase can continue to move since it is not subject to feature checking in intermediate positions, the presence of the overt complementizer would not result in the ungrammaticality, i.e. both (2a-b) would be grammatical, contrary to fact.

²⁸ The literature has claimed, with various arguments, that there is no Agree in intermediate positions in successive cyclic movement. See, e.g. Bošković (2007, 2008) and Cecchetto and Donati (2015). I turn to Bošković's work soon below.

Rizzi (2015) tries to derive Criterial Freezing from LA, claiming that when XP and YP have a different label in configuration [_α XP YP], one of them can move up. His argument amounts to claiming that in configuration [_α XP YP] with XP being in the Spec of the head Y, XP can move up when it does not share any features with Y.²⁹ Though the HP (6) is simply accounted for by saying that *which dog* and the embedded C share a Q-feature and the former cannot move up further, the other issues have to be accounted for with many assumptions. In the EPP (8a), the subject shares the person feature with the Person head, which is assumed to be one of the heads in the CP system and merge to TP; the subject is frozen in [Spec,PersonP]. In the ECP (8b), the *wh*-subject *who* shares the person feature with Person when it moves to [Spec,PersonP], which prevents the *wh*-subject from moving up further. To account for the Italian cases (7a-b), *pro*, an argument *pro* (7a) and an expletive *pro* (7b), is assumed to occupy [Spec,PersonP]. In (7b), it is claimed that the *wh*-subject *chi* skips [Spec,(embedded)PersonP], which is occupied by an expletive *pro*, and directly moves to [Spec,(matrix)CP] (Rizzi 2015:335,ft.16). See Holmberg (2005) for a convincing argument against assuming *pro*.³⁰

5. Conclusion

I have shown that the HP, (the violation of) the ECP and the EPP are given a unified account in terms of feature valuation, with the interface with phonology taken into consideration. I have argued that a category must stop in the position where it completes the valuation of all of its own unvalued features, which corresponds to the CriP. In the HP, a *wh*-object agrees with the embedded C_Q. It completes the valuation of all of its own unvalued features in the embedded Spec. It is frozen there and cannot move up further. In the ECP, a *wh*-subject should in principle move across a declarative complementizer: since the embedded C does not have Q, Agree does not occur between the *wh*-subject and the embedded C. The *wh*-subject, still having unvalued Q/*wh*-features, does not stop in the embedded Spec. It continues to move up to the highest Spec, where its unvalued features are valued by the matrix C_Q. The ECP violation is not idiosyncratic any longer, with the *that*-trace effect attributed to the matter of phonology. In the EPP, a subject must move to [Spec,TP] to value its own unvalued Case feature, which cannot be valued by v*. In [Spec,TP], the subject is assigned Nom. It completes the valuation of all of its unvalued features and stops there. With the subject located in [Spec,TP] both in English and in Italian, whether an overt subject is required or not is attributed to the requirement from the phonological component. I have argued that this unified account derives from one of the corollaries of the LA derivational system: labeling results from feature valuation in crucial cases.

In conclusion, first, the position designated as the CriP should not exist in the computational system of human language: it is simply the position where a category completes

²⁹ Actually, it is not necessary to refer to LA, since what he refers to as a label corresponds to the feature shared by a head and the category in its Spec. He also makes several assumptions, e.g. closeness of heads, the maximality condition on projections, etc, which in fact do not need to be assumed.

³⁰ The ECP violation (8c) is accounted for by assuming that when C disappears, the entire CP system including CP and PersonP is omitted (Rizzi 2015:335,ft.16), which is quite similar to Chomsky's (2015) account introduced in section 3.

the valuation of all of its own unvalued features. Secondly, as long as the issues of the HP, (the violation of) the ECP and the EPP are all accounted for in terms of feature valuation, with the interface with phonology taken into consideration, they are no longer particular principles and problems, and should be eliminated from the computational system of human language.

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