On the Feature-Checking of Embedded Clauses

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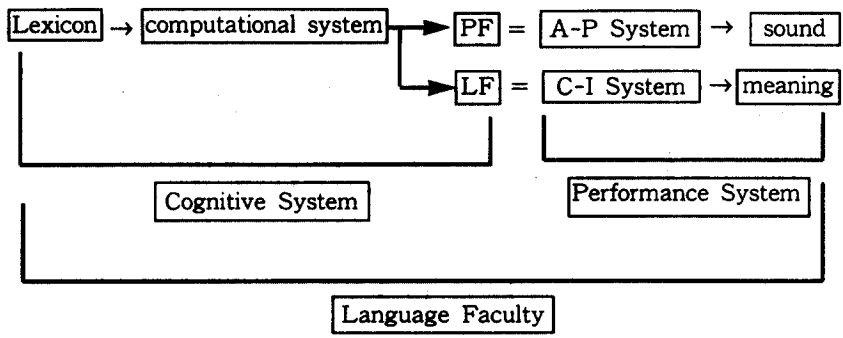
Chong-Taek Yu(1995). **On The Feature-Checking of Embedded Clauses.** *Linguistics. Vol 3.* This paper follows the Chomsky's (1995) assumption that AGR can be eliminated from the IP structure with a multiple specifier construction and multiple subject construction. Strictly speaking, a CP is a [±Q]P whose head is [±Q]. The [±Q]-Checking Principle (QCP) is that the English strong feature-checker [±Q] of an embedded clause (EC) cannot check off the formal features (FF) of more than one lexical item. EC optionally selects a DP-clause. For example, a sentential subject selects a DP-clause which can raise to a topic position, whereas an ECM verb selects a CP-clause. The FF(LI or EC) Raising Condition (FRC) is that a CP-clause or DP it contains cannot raise to a checking domain. This paper comes to a conclusion that both QCP and FRC are crucial to the raising of FF (LI or EC).

1. Introduction

Before the feature-checking of embedded clauses, let us sum up some crucial concepts of Chomsky's (1995) minimalist program (MP).[1] We take a particular language to be a generative procedure that constructs pairs (π, £) that are interpreted at the articulatory-perceptual (A-P) and conceptual-intentional (C-I) interfaces, respectively, as introductions to the performance systems. π is a PF representation and £ an LF representation, each consisting of legitimate objects that can satisfy the condition of Full Interpretation (FI). The MP has only two levels—PF and LF. Its grammatical system can be schematized, as in (1)[2]:

(1)



Chomsky assumes that the language determines a set of derivations. A derivation converges at one of the interface levels if it yields a representation satisfying FI at this level, and converges if it converges at both PF and LF; if not, it crashes. It seems that a convergent derivation must be optimal, satisfying certain natural economy conditions: locality of movement, no superfluous steps in derivations and so on. Less economical computations are blocked even if they converge.

Given the numeration (N), computational system (C_{HL}) computes until it converges at PF and LF with the pair (π, λ), after reducing N to zero. A perfect language should meet the condition of inclusiveness.[3] Therefore a core property of C_{HL} is feature-checking, the operation that derives overt or covert movement under the Last Resort condition.[4] A checked feature is marked "invisible"at the interface. If feature (F) is strong, then F is a feature of non-substantive category and F is checked by a categorial feature. Such a checking relation is established between a target and FF inserted or raised by operation Merge or Attract/Move.

Based on the Chomsky's Attract-F theory, this paper will try to find out some necessary FF to be checked off against strong features in embedded clauses, and explain their feature-checking relations which have not been specified clearly yet.

2. Feature-checking in a configuration with no AGR

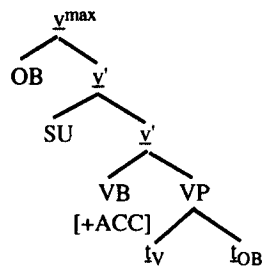
In his highly productive split-INFL theory, Pollock (1989) provides empirical arguments in favor of the view that Infl(ection) should not be considered as one constituent with two different sets of features ([±TENSE, ±AGR]) and that instead each of these sets of features is the syntactic head of a maximal projection, AGR and IP (the latter, to be called, more perspicuously. T(ENSE)P). Belletti (1990) also suggests that I^0, a head of IP, should not simultaneously contain all the material commonly associated to it, that is to say, both agreement features (AGR) and TENSE features (T). If this is the case, she assumes that AGR and T should rather be seen as two independent functional heads. Following the Pollock's split-INFL theory, Chomsky's recent papers assume that AGR, a collection of φ-features (gender, number, person) is common to subject and object agreement, though AGR_S and AGR_O may of course be different selections.[5]

In spite of their great contribution to the analysis of IP structure, Chomsky (1995) proposes that AGR be eliminated from INFL. Functional categories have a central place in his Attract-F theory, primarily because of their presumed role in feature-checking, which is what drives Attract/Move. Three functional categories – T, C, D – have [+Interpretable] features,[6] providing instructions at either or both interface levels, but AGR consists of [-Interpretable] formal features only. His theory is based on the assumption that AGR has no φ-features – that instead these features are assigned to substantive lexical items as they are drawn from the lexicon for numeration. For languages of the French-English type, AGR is not in the lexicon, so that there is no reason to postulate AGR.

As matters stand, it seems reasonable to conjecture that AGR does not exist and that φ-features of a predicate (P), though [-Interpretable], are like the Interpretable φ-features of nouns in that they are part of P in the numeration, added optionally as P is selected from the lexicon.

Let us now consider how FF are checked off in a configuration with no AGR. First of all, let us look at how OB checks off its Case and φ-features against a raising verb. Chomsky keeps to a transitive verb construction, that is to say, a multiple specifier construction (MSC) which includes a Larsonian shell,[7] as shown in (2):

(2)

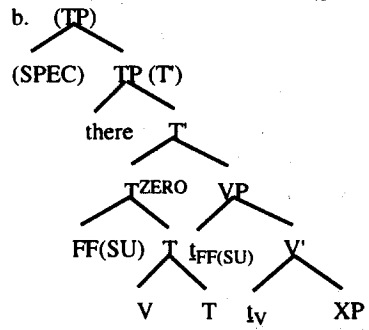


Here v is a light verb to which V overtly raises. VB(= [v V v]) is formed by the adjunction of V to v. OB and SU are outer and inner specifiers of a head v respectively. The light verb v has a strong D-feature (or perhaps, the more neutral strong [nominal-] feature), so that it requires overt substitution in the outer SPEC of MSC. OB will be in the checking domain of V, so that it checks off its [+ACC] Case and (object-agreement) φ-features. On the one hand, SU inserted by Merge[8] in [SPEC, v] is not in the checking domain of VB, because it does not head a non-trivial chain, that is to say, it's in a position to receive a θ-role by V without any movement. On the other hand, SU is not closer to higher v' than OB, for they are equidistant from t_{OB}.[9] No matter how equidistant they are from it, SU cannot possibly enter into the outer SPEC to check off its FF against VB. That is undoubtedly barred by the Minimal Link Condition (MLC),[10] since SU and OB are not equidistant from T, given the v-VP analysis of transitives; they are in different minimal domains; Therefore OB, only one candidate to enter into the outer SPEC, is able to check off its [+ACC] against VB in MSC with no AGR_O.

Secondly, if AGR_S doesn't exist in the lexicon, how can SU check off its FF(SU) – D-, Case-, and φ- features? According to the feature-movement theory developed in Chomsky (1995) and Lasnik (1995), LF movement is understood as the movement of FF only, such as Case- and φ-features, and not of an entire syntactic category constituted of such features.[11] Chomsky also keeps to a multiple subject construction, whether it is a transitive expletive construction (TEC) or not, in case of some languages.[12] Let us consider an English expletive-associate construction.

(3) a. there [FF(SU) [T^{zero} VP XP]]

b.



Here (3b) is a tree diagram of (3a). *There* is a pure expletive (EXP) with only a categorial feature D, which differs from *it* with Case- and φ-features as well as a D-feature. *There* lacks Case- and φ-features in an expletive-associate construction.[13] T has a strong D-feature which permits only an overt-raising, but in case of English, it does not permit overt-raising, as in (3b). For it has already been erased by the Merge of EXP in [SPEC, T]. Suppose that EXP is merged in a θ-position. That leads to a violation of the θ-criterion, crashing a derivation for convergence. Therefore Chomsky assumes that EXP should be in [SPEC, T], and that its Merge is more costless than Attract/Move.

Suppose a remaining lexical item *there* is drawn from the numeration. It soon merges with a target T'. First of all, the D-feature of *there* checks off the strong [nominal-] feature (EPP) of T. A raising verb V cannot have a strong feature at this stage of derivation, but a checking relation is established with T. A covertly raising FF(SU) subsequently adjoins to a maximal zero-level projection, checking off its features against the Case-feature of T and φ-features of V respectively.[14] The checked FF of T and V must be deleted and erased at LF, since both are [-Interpretable]. EXP has no other FF except the categorial feature D. Lacking the semantic feature, EXP has to be eliminated at LF. If its derivation (3b) is to converge, D must enter into a checking relation with an unchecked feature N. For its D-feature must be [-Interpretable]. Although the checking of the categorial feature of EXP deletes the D-feature, it does not erase the feature. According to the Longobardi's (1992) assumption that allows N-raising to D, the head-complement forms [D N there]. The D-feature checks off N in a properly-formed checking relation, just as in the D-complement structure.

So far, I have considered the Chomsky's assumption that AGR can be eliminated from INFL, and that OB or SU can check off its FF in MSC or TEC.

Let us turn to look at the checking of the FF of the functional category C (complementizer) that determines clause type. An English C has a strong feature, whose feature must be eliminated by the insertion of F_Q in the checking domain. F_Q may enter into the checking domain by Merge or Move, as illustrated in (4):

(4) a. (I don't know) [$_{CP}$ whether Q [$_{IP}$ he will come]]
b. (I don't know) [$_{CP}$ [$_{Q}$ if Q] [$_{IP}$ he is willing to come]]
c. (I don't know) [$_{CP}$ which book Q [$_{IP}$ John gave to Mary]]
d. [which book did Q [$_{IP}$ John give to Mary]]?

F_Q is often called the *wh*-feature, a variant of D. In (4a), *whether* containing F_Q merges with Q in [SPEC, Q], establishing the SPEC-head relation for feature-checking. Chomsky assumes that the strong feature of Q must be eliminated by insertion of F_Q in the checking domain before Q is embedded in any distinct configuration. If the operation is adjunction as in (4b), *if* adjoins to Q as a maximal zero-level category. What we may call the head-head relation is established for feature-checking in Q. If the substitution option is realized by raising of F_Q to [SPEC, Q]—overt *wh*-movement—as in (4c), the F_Q pied-pipes a full category *which book* for PF-convergence. Contrary to these three embedded interrogative sentences, (4d) is a direct interrogative sentence. F_Q therefore raises to the checking domain of Q, eliminating the strong feature of Q. In this case, an entire *wh*-phrase *which book* and INFL-complex *did* are pied-piped. The former raises to the SPEC position of Q, and the latter adjoins to the left of Q. In other words, the strong feature of C $[Q]_{ST}$ attracts F_Q $[=[D]_Q]$ containing [+WH], and induces I-to-C raising due to residual V-second property in English.

In addition, Chomsky assumes that the operation Merge must be overt with a single exception: covert insertion of an item α lacking phonological features, necessarily at the root. The option left open is that a phonologically null complementizer C may be inserted covertly at root. Since the operation Merge is covert, it cannot be substitution in [SPEC, C], but must be feature adjunction to C:

(5). a. John left.
b.*that John left.

A Declarative C is one of the force indicator, which is weak. It therefore must be present for interpretation at the C-I interface. But it never appears overtly: at the root we have (5a), not (5b). The former is understood as a declarative assertion.

If a declarative C is covertly inserted by the operation Merge, we come to assume that its feature must be checked off against a feature-checker [-Q] (see sec. 3.2). Although the covert insertion of C doesn't have an effect at the PF level, it has an effect at the LF level. Therefore it is not barred.[15]

To sum up, Chomsky (1995) postulates that we can eliminate AGR from the IP structure. The outer SPEC position of a light verb v of MSC can take the place of AGR_OP, and the SPEC position of T of a multiple subject construction, or T position of TEC AGR_SP. As assumed in the Chomsky's recent papers,[16] every syntactic element must check off its FF against feature-attractors by operation Merge/Move in a configuration with no AGR.

3. The feature-checking of embedded clauses

A lexical item has FF for syntactic feature-checking as well as its phonological and semantic features. It has major FF to be checked, as illustrated in (6):

(6) a. categorial features: [N], [D], [V], [C], etc.
b. φ-features on a DP, and verbal head: [person], [number], [gender]
c. Case-features: [nominative], [accusative], etc.
d. strong features: a light verb v, T, Q, etc.

Besides, FF can be distinguished by [$\pm$Intrinsic] features: [+Intrinsic] features are obligatory FF that are listed in a lexical item (LI) (or determined by listed features), whereas [-Intrinsic] features are optional FF that are added as LI enters into the numeration. Categorial features and Case-features of Case assigners (T and V) belong to [+Intrinsic], whereas φ-features (V and N) and Case-features of Case-assignees belong to [-Intrinsic].

Certain features of FF(LI) enter into interpretation at LF, whereas others are uninterpretable and must be eliminated for convergence. Such FF as categorial features and φ-features of N, and Q-features of C are semantically relevant and enter into interpretation at LF. Contrarily, such FF as Case-features, φ-features of V are semantically irrelevant and do not enter into

interpretation at LF.

All the FF in embedded clauses as well as ones in root sentences (see (5)) must be checked off by the overt movement of lexical items before Spell-out, and by the covert one at LF. Among others, let us now investigate the feature-checking of an interrogative head Q, and the feature-checking of embedded clauses.

3.1 The feature-checking of embedded interrogative clauses

As noted in (4), Chomsky assumes that a strong feature-attractor (or trigger) Q checks off [WH]- and C-features, and verb-features pied-piped by a (complex) verb from I to C. However, it seems to us that he doesn't clearly establish the checking relations between Q and feature-checkees in the CP of an embedded interrogative clause (EIC). First of all, let us consider the CP-structures of embedded interrogative clauses both diachronically[17] and synchronically:

(7) a. Ech man loke [$_{CP}$ [whether that] I ly].
...circa 1395, *Plowman's T*, 834
(Each man looks whether I lie down.)
b. [$_{CP}$ [Who that] holdeth ageynst it we wille slee hym].
...1470-85, *Malory Arthur* I . vii
(Who hold against it, we will slay him.)
c. What will Berowne say [$_{CP}$ [when that] he shall heare Faith infringed]?
...1588, Shaks, *L. L. L.* iii, 145
(What will Berown(e) say when she shall hear the Faith infringed?)
d. [$_{CP}$ [Où que] tu vas]?
...popular French
Where that you go? (Where are you going?)
e. [$_{CP}$ [Che belle gambe che] hai]!
...Italian
What pretty legs that you-have! (What pretty legs you have!)

Middle English (ME) in (7a)-(b), and even early Modern English (MnE) in (7c) prove that an English CP-structure originally consists of a *wh*-word and a complementizer *that*, whether it is in an embedded clause (EC) or not. French in (7d) and Italian in (7e) also prove that each CP-structure consists of a *wh*-word and a complementizer *that* just like ME and MnE.

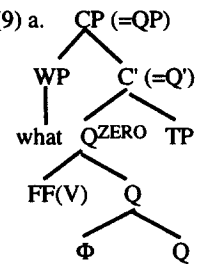
However, we can assume that, in case of present English, the CP-structure of an (embedded) interrogative clause consists of only a lexical *wh*-word and a phonologically null complementizer Φ, a variant of *that*. The complementizer Φ merges covertly with Q before Spell-Out as if it were a lexical item. It must be present for interpretation at the C-I interface but never appears overtly. Let us consider the CP structure of embedded interrogative clauses:

(8) a. He does not know $[_{CP\ (=QP)}\ [_{WP}$ what$]\ [_{Q}\ \Phi\ Q]$ it is to be in debt].
b. The point is $[_{CP\ (=QP)}\ [_{WP}$ whether$]\ [_{Q}\ \Phi\ Q]$ you succeed or fail].
c. He asked $[_{CP\ (=QP)}\ [_{WP}$ if$]\ [_{Q}\ \Phi\ Q]$ I knew Spanish].[18]
d. She wondered $[_{CP\ (=QP)}\ [_{WP}$ e] $[_{Q}$ would $\Phi\ Q]$ he come back again].[19]

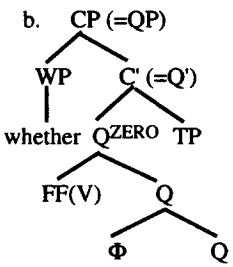
Each WP in (8a)-(d) is a *wh*-word phrase which exceptionally includes *if* and *e*(mpty element), pied-piping a Q-feature(=F_Q) to be checked off against Q. And each Q in (18a)-(d) merges with a null complementizer Φ as a head of two-segment category. That is to say, Φ is checked off against its feature-checker Q in a head-head relation. Although the covert insertion of Φ doesn't have a PF effect, its insertion is not barred. For it has an LF effect. We come to assume supporting Chomsky's (1995) economy principle (see note 15) that Φ exists in lexicon and can be drawn from it for numeration in case of necessity.

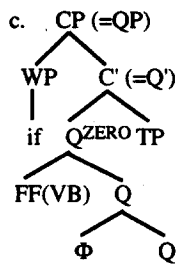
As suggested in (7). a phonologically null complementizer Φ merges with a strong feature-checker Q in the CP-structure of embedded interrogative clauses. Let us now consider how the feature-checker Q checks off its FF against a complementizer, verb, and *wh*-word. Each CP-structure of (8a)-(d) can be schematized correspondingly, as in (9a)-(d) below:

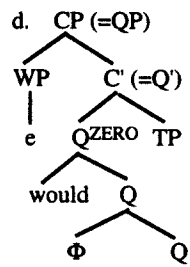
(9) a.



b.



c. 

d. 

In each of (9), Q is a head of CP (strictly speaking, QP), which has strong features to check off three kinds of feature-checkees—Φ, V, and *wh*-word. Q^{ZERO} is a maximal zero-level projection as a two-segment category. In case of (9a), first, a covertly inserted Φ checks off its feature against the lowest Q in the head-head checking relation. Secondly, a covertly raising FF(V) checks off its feature against the Q which is a sublabel of the target of adjunction.[20] Lastly, a overtly raising *what* checks off its feature against Q^{ZERO} in the SPEC-head checking domain. In (9b), a overtly merging *whether*[21] lastly checks off its feature against Q^{ZERO}, and the others have the same feature-checking relations as (9a). In (9c), a overtly merging *if* like *whether* also checks off its feature against Q^{ZERO}, and the rest has the same feature-checking as (9a). In (9d) which conveys the semi-indirect speech, a modal auxiliary adjoins to a head Q, and it checks off its feature against the lowest Q. In particular, *e* checks off its covert Q-feature against Q^{ZERO} like lexical WP.

In short, a feature-checker Q of an English embedded interrogative clause checks off the FF of Φ, verb, and *wh*-word in order. Besides, as illustrated in (5), the declarative null complementizer of an embedded declarative clause (EDC) may also be inserted covertly at root. This fact leads us to suggest the [±Q]-Checking Principle (QCP):

(10) An English strong feature-checker [±Q] of an embedded clause cannot check off the formal features of more than one lexical item.

Here [+Q] (=Q) is a strong feature-checker of an embedded interrogative clause, while [-Q] is that of EDC. In short, every embedded English CP-structure has a lexical item and Φ, the former, or the latter.

This time, let us turn to look at the feature-checking of EIC as a whole, as shown in (11):

(11) a. [$_{DP}$ [d] [$_{CP\ (=NP)}$ what he says]] is clear].
b. I can't understand [$_{DP}$ [d] [$_{CP\ (=NP)}$ what he says]].
c. We talked about [$_{DP}$ [d] [$_{CP\ (=NP)}$ when he should leave]].
d. It does not matter [$_{CP}$ what he said].
e. It is not important [$_{CP}$ how you do it].

EIC optionally not only receives a θ-role by an initial Merge, but also carries along its FF to be checked against either VB or V, and T by a subsequent Attract/Move. In other words, it may behave just like an NP in a matrix clause. This means that the CP of EIC carries along a categorial feature [N] drawn optionally from lexicon as it enters into the numeration. Therefore the CP of EIC may extend to a DP structure which consists of an empty determiner [d] and an N-feature category CP—[$_{DP}$ [d] (CP=NP)].[22] A DP in (11a) has D-(to satisfy the EPP-feature) and Case-, and φ-features which are all checked off against T and V respectively. A DP in (11b) has Case- and φ-features to be checked off against a complex verb VB. Finally, a DP in (11c) has only a Case-feature to be checked off against a preposition. Contrary to (11a)-(c), each CP in (11d)-(e) does not extend to a DP, but remains in situ. For, as supposed in Chomsky (1994, 1995), an expletive *it*[23] has Case- and φ-features unlike a pure expletive *there*. The former satisfies all properties of the INFL-V head it checks, erasing the relevant features. Therefore it bars an associate from raising. Each embedded interrogative clause requires no feature-checking, for it is not a DP-clause but a CP-clause. In conclusion, we come to an assumption that a CP of EIC may optionally extend to a DP as it enters into the numeration.

3.2 The feature-checking of embedded declarative clauses

It has been suggested that an clausal associate of an expletive *it*—EDC—requires no feature-checking. Let us consider the following illustrations:

(12) a. It is believed [$t_{(it)}$ to have been proved [$_{CP}$ that •••]].
b.*It is believed [[$_{CP}$ that •••] [$_{TP}$ to have been proved]]].
c.*He makes [$_{CP}$ to take a walk every morning] a rule.

Here (12a) is acceptable, for an embedded *that*-clause (*th*-c) has no FF to be checked off. On the contrary, (12b)-(c) are not acceptable. It is because *th*-c in (12b) doesn't have a D-feature to satisfy the EPP-feature of T, and because

an embedded infinitival clause (*in-c*) in (12c) doesn't have FF to satisfy Case- and φ-features of *makes* in an outer SPEC position of $\underline{v}$.

If either *th-c* or *in-c* is a sentential subject without an expletive *it* left in the numeration, we will expect such a derivation to crash. For, as discussed in (12), both *th-c* and *in-c* do not have any FF to be checked off. Nevertheless the derivation will be a convergent one. Let us take a careful look at the following illustrations embedding sentential subjects:

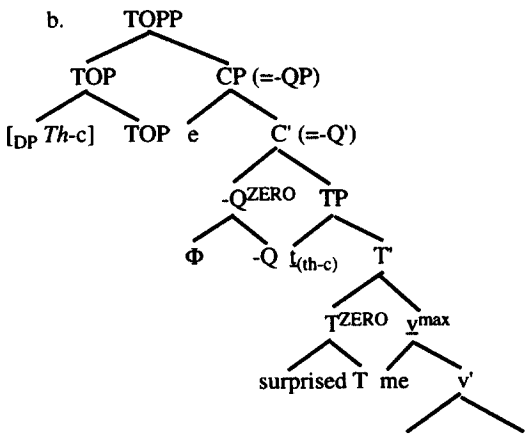
(13) a. $[_{DP}$ [d] $[_{CP\ (=NP)}$ That Pauline moved to Kansas]] surprised me.
b. $[_{DP}$ (d) $[_{CP\ (=NP)}$ To err]] is human, to forgive divine.
c.*Did $[_{DP}$ (d) $[_{CP\ (=NP)}$ that Pauline moved to Kansas]] surprise me?
d.*Is $[_{DP}$ (d) $[_{CP\ (=NP)}$ to err]] human?

Both *th-c* in (13a) and *in-c* in (13b), which are DPs just like embedded interrogative clauses in (11a)-(c), satisfy the feature-checking conditions in case of embedded declarative clauses. As a result, they yield convergent derivations. In case of interrogative clauses, DPs in (13c)-(d) also satisfy the feature-checking conditions, but they yield unconvergent derivations. How should we explain such an unexpected result? To solve this problem, Stowell (1981a) suggests following Emond's (1976) claim that a subject clause is not really in a subject position, but rather in a topic position.[24] It seems to us that their assumption applies well in this case. Each DP in (13a)-(b) raises to topic position to erase its TOP-feature, whereas each DP in (13c)-(d) fails to raise to a topic position, so that it never erases its TOP-feature. We assume that a topic phrase (TOPP) consists of a head TOP and a CP:

(14) TOPP $\rightarrow$ TOP — CP

If it is the case, let us take the topic structure of (13a) as an example

(15) a. $[_{TOPP}$ $[_{TOP}$ $[_{DP}$ (d) $[_{CP\ (=NP)}$ That Pauline moved to Kansas]] TOP] $[_{CP\ (=QP)}$ $[_{-Q}$ Φ -Q] $[t_{(th\text{-}c)}$ surprise me]]].



In (15a), EDC —*th-c* —raises to a topic position, its TOP-feature checked off against a head TOP. (15b) is a tree-diagram of (15a). As suggested in (8), a phonologically null complementizer Φ must be an alternant of *that* which should be checked off against [-Q]. [-Q] is the head of a CP (strictly speaking, -QP). *Th*-c in [SPEC, T] satisfies three kinds of FF—EPP- and Case-features of T, and φ-features of *surprised.* It subsequently merges with a head TOP which has a strong feature, irrespective of the Stowell's (1981) Case Resistance Principle (CRP). That is to say, the embedded *that*- clause raises only to check off its TOP-feature against the strong feature-checker TOP. In short, we come to an assumption that EDC can optionally select a TOP-feature as well as the other FF from lexicon as it enter into the numeration.

Let us look at some different embedded interrogative clauses on the basis of an assumption that the FF of *th-c* can optionally be selected from lexicon:

(16) a. I take it [$_{CP}$ that she has found him].
b. [$_{DP}$ Word] came to me [$_{CP}$ that she was magnificent on the stage].
c. They wanted [$_{DP}$ (d) [$_{CP\ (=NP)}$ the danger to be removed]].
d. Columbus believed [$_{DP}$ (d) [$_{CP\ (=NP)}$ that the earth is round]].

Th-c in (16a) is a CP which lacks Case- and φ-features, and one in (16b), an appositive clause of [$_{DP}$ word], is also a CP. They therefore require no movement for feature-checking. Contrary to them, each embedded *that*-

clause in (16c)-(d) is a DP which has D-, Case-, and φ-features, so that it raises to the outer SPEC position of a light verb v for feature-checking.

Let us now turn to the unconvergent derivations caused by the mismatch of TOP-features in embedded declarative clauses, as illustrated in (17):

(17) a.*[$_{TOP}$ [$_{CP}$ That Jenny is a good hostess] TOP], [$_{CP}$ it is self-evident t$_{(th\text{-}c)}$].
b.*[$_{TOP}$ [$_{DP}$ Bananas] TOP] [$_{CP}$ I don't believe [$_{DP}$ the rumor [$_{CP}$ that he hoards t$_{(bananas)}$]]].
c.*[$_{DP}$ Linguistics], [$_{TOP}$ [$_{DP}$ (d) [$_{CP\ (=NP)}$ for you to give up t$_{(linguistics)}$]] TOP], [$_{CP}$ t$_{(in\text{-}c)}$ would be a wise move].

Even if *[$_{CP}$ th-c]* in (17a) carries along its TOP-feature from a matrix clause CP, the derivation crashes. Why does it crash? The answer to this question is that *[$_{CP}$ th-c]* doesn't have any other FF by which the TOP-feature can be pied-piped as a free-rider. That is to say, *[$_{CP}$ th-c]* is a CP-clause. *[$_{DP}$ bananas]* in (17b) checks off its Case- and φ-features in *[$_{CP}$ th-c]*, constituting a complex noun phrase (CNP), but it can't raise to a topic position for being checked off its TOP-feature. It is because *[$_{CP}$ th-c]* lacks Case- and φ-features. In case of (17c), *[$_{DP}$ [$_{CP\ (=NP)}$ in-c]]* raises to a topic position, as supposed in (13). As soon as a strong TOP-feature checker checks off the TOP-feature of *[$_{DP}$ [$_{CP\ (=NP)}$ in-c]]*, it is erased in a topic position. *[$_{DP}$ linguistics]* cannot have the TOP-feature checker any longer, so that (17c) crashes the derivation. We may tentatively define the Topic Condition, as in (18):

(18) The TOP-feature of a CP-clause is a free-rider, and no DP raises from a CP-clause to a topic position.

This Topic Condition will be refined in the following section.

4. Feature-raising for convergence

All the FF of syntactic elements must be checked off in the checking relations. In other words, all the feature-checkees must raise overtly or covertly to their optimal feature-checkers. If features mismatch, the derivation terminates. If they match, the derivation converges. To begin with, let us reconsider the topicalization of embedded clauses:

(19) a. $[_{TOP}\ [_{DP}\ [_{CP\ (=NP)}$ That someone would be invited]] TOP], $[_{CP}$ I never expected $t_{(th\text{-}c)}$]

b.*$[_{TOP}\ [_{CP}$ someone to be invited] TOP], $[_{CP}$ I never expected $t_{FF(someone)}\ t_{(in\text{-}c)}$]

c. $[_{TOP}\ [_{DP}\ [_{CP\ (=NP)}$ That he is honest]] TOP], $[_{CP}$ I know $t_{(th\text{-}c)}$]

According to the Topic Condition formulated in (18), (19a) is a convergent derivation. For its TOP-feature is pied-piped by the D-, Case- and φ-features of $[_{DP}\ [_{CP\ (=NP)}\ th\text{-}c]]$. What we call an exceptional Case-marking (ECM) verb *expect* in (19b) select a CP-clause from lexicon, but it allows a subject of *in-c* to raise covertly to the outer SPEC position of a light verb $\underline{v}$ in the matrix clause. Here $t_{FF(someone)}$ is a trace of FF(someone) left in the outer SPEC of a light verb $\underline{v}$ by a covert movement.[25] It satisfies the D-(=EPP-)feature of T in an *in-c*, and Case- and φ-features of VB in a matrix clause. It is sure that an ECM verb has an exceptional feature to attract Case- and φ-features of an infinitival subject. Nevertheless a TOP-feature in (19b) mismatches, since *in-c* is a CP-clause which cannot carry along its TOP-feature. The Topic Condition applies accurately in this case. *Th-c* in (19c) satisfies all the feature-checking condition as a DP, so that it matches. If so, we can refine the Topic Condition (18), as in (20):

(20) A CP-clause or DP it contains cannot raise to a topic position.

We have known that the Ross' (1967) Complex NP Constraint rules out the movement of any constituent out of a complex NP clause. However, given the Topic-Condition (20), we can dispense with the CNPC. Let us consider the raising of EC out of a complex NP clause:

(21) a.*$[_{TOP}\ [_{CP}$ That the rain was causing the accidents] TOP], John made $[_{DP}$ claim] $t_{(th\text{-}c)}$.

b.*$[_{TOP}\ [_{CP}$ Who knew very little about politics] TOP], John was speaking to $[_{DP}$ a student] $t_{(wh\text{-}c)}$.

c. $[_{DP}$ The claim] was made by John $t_{(the\ claim)}$ $[_{CP}$ that the rain was causing the accidents].

Both *th-c* (21a) and *wh-c* in (21b) are feature-unchecked clauses, that is, CP-clauses, so that they violates the Topic Condition (20). On the contrary, if each feature-unchecked clause remains in situ, its computational operation clearly yields a convergent derivation at LF. In (21c), a DP raises from a

complex NP to the subject position irrespective of the Topic Condition, for it is not in a CP-clause.

Let us turn to look at the raising of a DP from a CP-clause to [SPEC,Q]:

(22) a.*[$_{DP}$ What] did you quip [$_{CP}$ that Mary wore t$_{(what)}$]?
b.*[$_{DP}$ What] have you met [$_{DP}$ the man] [$_{CP}$ that invented t$_{(the\ man)}$]?
c.*[$_{DP}$ What] do you believe [$_{DP}$ fact] [$_{CP}$ the earth turns around t$_{(what)}$]?

Each DP in (22a)-(c) mismatches in [SPEC, Q] without fail. It's because each embedded clause is a CP-clause. As noted in Stowell (1981b), the clausal complement of a nonbridge verb *quip* (=utter a quip) in (22a) is not actually assigned a thematic role in conventional sense.[26] In other words, such a nonbridge verb as *quit* does not require a DP-clause, but a CP-clause. Both the embedded clauses in (22b)-(c) are also CP-clauses. We come to an assumption that a CP-clause bars a *wh*-word with a Q-feature (=F_Q) from raising to the SPEC position of Q. In the long run, we can formulate the FF(LI or EC)-Raising Condition (FRC) including the Topic Condition (20), as in (23):

(23) A CP or DP it contains cannot raise to checking domain.

Even if a DP raises from a feature-checked clause—a DP-clause—to a checking domain, its derivation sometimes crashes. Let us finally consider whether the raising of a DP from a DP-clause to [SPEC, Q] in a matrix clause matches or mismatches in association with the QCP (10) and the FRC (23):

(24) a. We know [$_{DP}$ (d) [$_{CP}$ [$_{WP}$ what] [$_{Q}$ Φ Q] it is to be poor]].
b.*[$_{CP}$ [$_{WP}$ What] [$_{Q}$ do Q] you know [$_{DP}$ (d) [$_{CP}$ t$_{(what)}$ [$_{Q}$ Φ Q] it is to be poor]]]?
c. [$_{CP}$ [$_{WP}$ Who] [$_{Q}$ do Q] you think [$_{DP}$ (d) [$_{CP}$ t$_{(who)}$ [$_{-Q}$ Φ -Q] t$_{(who)}$ broke the window]]]?
d.*[$_{CP}$ [$_{WP}$ Who] [$_{Q}$ do Q] you think [$_{DP}$ (d) [$_{CP}$ t$_{(who)}$ [$_{-Q}$ that -Q] t$_{(who)}$ broke the window]]]?
e. [$_{CP}$ [$_{WP}$ What] [$_{Q}$ do Q] you think [$_{DP}$ (d) [$_{CP}$ t$_{(what)}$ [$_{-Q}$ that -Q] he broke t(what)]]]?

As shown in (24a), *know* seems to require that its clausal complement optionally have a head Q. The head checks off only one lexical item, so that

the derivation follows the QCP. In case of (24b), the instant *what* in the SPEC position of lower Q checks off its Q-feature (=F_Q) against the head Q, the Q-feature is erased. Suppose *what* raises further from a DP-clause to the SPEC position of a higher Q. It does not violate the FRC, but the derivation crashes. It is because *what* has already lost its Q-feature to be checked off against a head Q. Contrary to *know*, such a verb as *think* in (24c)-(e) seems to require that its clausal complement have a head [-Q]. In (24c), the raising of *who* follows the QCP and FRC without fail, so that its feature-checking matches completely. Nevertheless the raising of *who* in (24d) violates the QCP. Its raising also violates the *[that-t] filter supposed in Chomsky and Lasnik (1977). However, the filter is so circular that it cannot give us explanatory adequacy. We assume that QCP can give us more explanatory adequacy than the filter. For [-Q] in (24d) can never checks off the FF of *what*. The categorial and φ- features of a DP remain accessible after checking, while the Case-feature does not. Therefore a single DP can enter into multiple satisfaction of EPP and multiple agreement, but not multiple Case-relations.[27] *Who* in the SPEC position of [-Q] has D-, Q-, and φ- features, but its FF mismatch with [-Q]. No matter how quickly *who* may raise to the SPEC position of Q, the D-feature of a subject to satisfy the EPP-feature of T is certain to mismatch with [$_{-Q}$ that -Q]. For Q- and φ-features can raise to the SPEC position of Q as free-riders of *who* just like those of *what* in (24e). *What*, which has Q- and φ- features in the SPEC position of [$_{-Q}$ that -Q], raises to that of Q without mismatch. It seems to us that only a D-feature to satisfy the EPP-feature of T cannot be a free rider in the SPEC position of [$_{-Q}$ that -Q]. *Who* in (24d) follows the FRC, but violates the QCP because of *who* with a D-feature in the SPEC position of [$_{-Q}$ that -Q]. In short, A head [-Q] of EDC sees only a D-feature to satisfy an EPP-feature of T when a WP (=*wh*-word) passes through the SPEC position of [$_{-Q}$ that -Q]. As matters stand, we cannot help leaving this particular problem unsolved.

5. Conclusion

As assumed in Chomsky (1995), a core property of computational system is feature-checking, the operation that derives overt or covert movement under the Last Resort condition. He also assumes that AGR can be eliminated from the IP structure. The outer SPEC position of a light verb v of a multiple specifier construction can take the place of AGR_OP, and the SPEC position of T of a multiple subject construction, or T position of TEC

AGR_SP. Based on his Attract-F theory, this paper has tried to find out formal features (FF) to be checked off in embedded clauses, and explain their checking-relations.

In case of present English, we assume that the CP-structure of an embedded interrogative clause consists of a *wh*-word and a phonologically null complementizer Φ, whereas that of an embedded declarative clause *that* or Φ. Their FF are all checked off against a strong feature [±Q]. Strictly speaking, a CP is a [±Q]P. The [±Q]-Checking Principle (QCP) is that an English strong feature-checker [±Q] of an embedded clause cannot check off the FF of more than one lexical item. An embedded interrogative clause (EIC) may behave just like an NP in a matrix clause, so that the CP of EIC carries along a categorial feature [N] drawn optionally from lexicon as it enters into the numeration. In this case, the CP of EIC may extend to a DP-structure which consists of an empty determiner (d) and N-feature category CP (=NP).

A sentential subject, which is an embedded *that*-clause (*th-c*) or infinitival clause (*in-c*), raises to a topic position as a DP-clause in order to erase its TOP-feature. An embedded declarative clause (EDC) can optionally draw a D-feature as well as the other FF as it enters into the numeration. An ECM verb can optionally select a CP-clause from lexicon, but it allows a subject of *in-c* to raise covertly to the outer SPEC position of a light verb v in the matrix clause. If so, the CP cannot raise to the topic position. According to the the Topic Condition, a CP-clause or DP it contains cannot raise to a topic position.

We can formulate the FF(LI or EC)-Raising Condition (FRC) including the Topic-Condition: a CP or DP it contains cannot raise to a checking domain. Besides, it seems to us that a head [-Q] of EDC sees only the D-feature to satisfy an EPP-feature of T when a WP passes through the SPEC position of $[_{-Q}$ that -Q], so that the raising of a subject out of EDC violates the QCP.

This paper concludes that EC can optionally select a DP-clause from lexicon as it enters into the numeration, and that the raising of a lexical item or clause should follow both QCP and FRC.

Notes

1. Chomsky (1995) have adopted, modified, and extended work in the Chomsky & Lasnik's (1991) model.
2. See Yang (1995) for more detail.
3. Any structure formed by the computation (in particular, π and £) is constituted of elements already present in the lexical items selected for N; No new objects are added in the course of computation apart from rearrangement of lexical properties.
4. Chomsky (1995) revises the Last Resort condition assumed in Chomsky (1993):

(29) F is unchecked and enters into a checking relation.

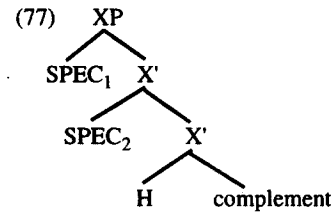
5. Pursuing the basic lines of Pollock's (1989) analysis, Chomsky (1991) finds two kinds of AGR elements: the subject-agreement AGR_{-S} and the object-agreement AGR_{-O}. On the general assumptions, AGR_{-O} should be close to V, and AGR_{-S} close to the subject, therefore more remote from V. Confer Chomsky (1993).
6. Evidently, certain features of FF(LI) enter into interpretation at LF while others are uninterpretable and must be eliminated for convergence. We therefore have a crucial distinction [$\pm$ Interpretable]. Among the Interpretable features are categorial features and the φ-features of nominals. The Case features of V and Tense are intrinsic but [-Interpretable], hence eliminated at LF. See Chomsky (1995).
7. See Larson (1988) for more detail.
8. According to Chomsky (1994), the operation Merge is asymmetric, projecting one of the objects to which it applies, its head becoming the label of the complex formed.
9. γ and β are equidistant from α if γ and β are in the same minimal domain. See Chomsky (1993, 1994. 1995).
10. Chomsky (1995) refined the Minimal Link Condition like the following:

(110) K attracts α only if there is no β, β is closer to K than α, such that K attracts β.

11. Jang (1995) assumes that only Case- and agreement-features of the associate DP raise to the expletive position in LF while the c-command relationship between the associate and negation remains unaffected.

12. Chomsky's (1994) bare phrase structure theory allows multiple SPECs in principle. If so, we will have the structure (77):

(77)



Here we may assume $SPEC_1$ and $SPEC_2$ to be equidistant targets for movement, being within the same minimal domain. Such ideas and phenomena related to them have been investigated in recent works.

13. In an expletive-associate construction, Belletti (1988) considers the properties of partitive Case and concludes that it is not a structural Case, like accusative or nominative, but rather is an inherent Case, as in the sense of Chomsky (1986b). See Lasnik (1992) for more detail.

14. K attracts F if F is the closest feature that can enter into a checking relation with a sublabel of K. See Chomsky (1995).

15. Chomsky's (1995) economy principle is assumed as in (76):

(76) α enters the numeration only if it has an effect on output.

16. In Chomsky (1986a), he assumes for the first time that every element that appears in a well-formed structure must be licensed in one of a small number of available ways..

17. See "whether","who", and "when"in *The Oxford English Dictionary* (OED).

18. Contrary to a Chomsky's (1995) assumption, we assume that *if* is merged in a WP—the SPEC position of Q—just like a *whether that* construction in early MnE.:

> We should not question [if that] he should live.
> ...1594, *First P't.* Contention (1843) 37

Relative or conjunctive subordinants in ME were often reenforced by *that* (*þat*): *how that, whan (when) that, which that, if that,* etc. See *The OED* and Mossé (1952).

19. As Emonds (1976) notes, inversion can take place not only in

main clauses but also in embedded clauses (in so-called 'semi-indirect speech'). But as Goldsmith (1981) notes, inversion is blocked when the embedded complement clause is introduced by an overt complementizer.

20. A sublebel of K is a feature H(K)ZERO. The computation "looks at "only F and a sublevel of K, though "see "more. See Chomsky (1995) for more detail.

21. Even in Modern English, *whether* was used as an interrogative particle introducing a disjunctive direct question, expressing a doubt between alternatives:

a. [Whether does] Doubting consist in embracing the Affirmative of Negative Side or a Question?

...1713, Berkeley *Hylas &Phil.* 1. (1725) 5

b. [Whether do] you demonstrate these things better in Homer or Hesiod?

...about 1822, Shelley *lon* Pr. Wks, 1888 II. 115

22. Kayne (1993) has advanced a radical alternative to the standard assumption, proposing that order reflects structural hierarchy universally. Specifically, he proposes the Linear Correspondence Axiom (LCA), which states that asymmetric c-command imposes a linear ordering of terminal elements. See Chomsky (1994).

23. Expletive *it* is a cataphoric anticipatory subject, as noted in Ek & Robat (1984).

24. Confer Chomsky (1977) and Yim (1984).

25. In the ECM structure, the head H assigns no Case so that its subject raises to the checking domain of AGR_O in the matrix clause; more precisely, its formal features raises covertly to this position. See Chomsky (1995) for more detail.

26. The clausal complements of nonbridge verbs are rather interpreted as adjuncts to the entire VP_s since these verbs absorb the thematic object position. See Stowell (1981b).

27. Agreement can be assigned with or without Case—in the higher and lower [SPEC, AGR] positions, respectively. See Chomsky (1995).

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