FUNCTIONAL CATEGORIES AND PRINCIPLE OF FULL INTERPRETATION*

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0. Introduction

There has been extensive discussion in recent literature on the theory of phrase structure which concerns dismantling the categorial component and deriving the properties of phrase structure, i.e. precedence relations and domination relations, from general principles of other components of the grammar. Koopman (1984), Stowell (1981), and Travis (1984) have been devoted to showing that precedence relations can be deduced form Case theory and θ-theory, while leaving the X-bar schema as a set of well-formedness conditions on domination relations. Speas (1986) has extended their works, and has argued that the restrictions on domination relations encoded in the X-bar schema would also be derivable from other components of the grammar. Her proposal is based on the theory of lexical representations of Higginbotham (1985a;1985b), where words of all lexical categories (N, V, A, P) are assumed to have a θ-grid as part of their lexical entry. She has shown that the relations which hold among θ-grids are sufficient to give all the information that is needed to deduce the domination relations which result when these lexical entries are projected from the lexicon. Under her theory, no lexical head or its projections are licensed by well-formedness conditions on phrase structure configurations. It has been argued that such a "modular" approach to phrase structure is theoretically desirable since it would severely restrict the descriptive power of the categorial component or would eliminate the categorial component entirely so that explanatory power is increased. However, there are elements in the realm of phrase structure which have so far escaped an account in a modular fashion: functional (non-lexical) categories. It is to exploring the possibility of stating the licensing conditions for functional categories, especially COMP and INFL, in a modular fashion that the discussion of this paper is devoted.

1. Theoretical Background

1.1 A System of Category Projection

The present study assumes a system of category projection proposed in Fukui (1986), Fukui and Speas (1986), and Speas (1986). Their system of category projection would be summarized as follows:

(i) Lexical categories are those which bear the categorial features ([+/-N] and [+/-V]) and have θ-grids as part of their lexical entries, namely N, V, A, and P. They project up to a single-bar level $\bar{X}$ allowing free recursion at that level as far as licensed by the projection principle or the principle of modification or predication.

(ii) Functional categories are those which neither bear categorial features nor have θ-grids as their lexical entries, namely COMP, INFL, and DET. They project up to a double-bar level $\bar{\bar{X}}$ taking a unique specifier and a unique complement.

(iii) A specifier is an element closing off a category projection. Since a projection of lexical categories is indefinitely iterable, only functional categories may have a specifier in this sense.

(iv) A specifier position can only appear when Kase is assigned to that position, otherwise the projection of a functional category stops at the single-bar level. The term "Kase" employed here refers to both Case in the standard sense, i.e. Case assigned by lexical categories, in particular objective Case assigned by V, and functional features assigned by functional categories, i.e. nominative

Case assigned by tense/AGR, [+WH] assigned by a WH-COMP, and genitive Case assigned by *'s*.

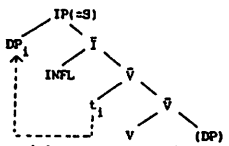
(v) The relation between a functional category and its specifier is an instance of agreement ("Spec-head" agreement).

(vi) As V and P do not always assign Kase (for instance, intransitive verbs do not assign Kase, i.e. objective Case, to the immediately following DP(=NP)), neither do functional categories. Each functional category includes some elements which assign functional features or other elements which do not assign these features, as shown in the following paradigm:

	C	I	DET
Kase-assigner	+WH	Tense/AGR	*'s*
Non-Kase-assigner	that	*to*	*the*

(Fukui, 1986, p. 55)

(vii) All arguments of the verb appear under a projection of the verb. A movement operation parallel to that in the standard Raising cases takes place in ordinary tensed sentences, as depicted below [1]:



According to this system of category projection, the notion "maximal projection (category)" has quite a different content than the one generally assumed in the literature. Specifically, this system would make it impossible for us to define the notion of maximal projection in terms of the number of bars of a given node. We have to define "maximal projection" based on something other than the number of bars. Fukui's (1986) definition is given below:

(1) α is the MAXIMAL PROJECTION CATEGORY iff α is a projection path $N = (\beta_1, \ldots, \beta_n)$ such that
 (i) β_1 is the maximal projection node, and
 (ii) all β_i have the same number of bars
(Fukui, 1986, p. 167)

where PROJECTION PATH and the MAXIMAL PROJECTION NODE are defined as follows:

(2) N is a PROJECTION PATH iff N is a sequence of nodes $N = (n_1, \ldots, n_n)$ such that
 (i) $\forall_i$, n_i immediately dominates n_{i+1}
 (ii) all n_i have the same set of FEATURES, and
 (iii) the bar level of n_i is equal to or greater than the bar level of n_{i+1}
(Fukui, 1986, p. 164)

(3) n_i is the MAXIMAL PROJECTION NODE of a projection path $N = (n_1, \ldots, n_n)$ iff $i = 1$. (Fukui, 1986, p. 166)

1.2 Government and Barriers

"Government" is a structural notion involving the more basic notion "c-command" and "m-command". Chomsky's (1986b) definition is given below:

(4) Government
 a. α governs β iff α m-commands β and there is no γ, γ is a barrier for β, such that γ excludes α.
(Chomsky, 1986b, p. 9)
 b. If α governs β, it also governs the head of β [2].

(5) C-command
 α c-commands β iff α does not dominate β and every γ that dominates α dominates β.
(Chomsky, 1986b, p. 8)

(6) M-command
 α m-commands β iff α does not dominate β and every γ, γ a maximal projection (category), that dominates α dominates β.
(Chomsky, 1986b, p. 8)

where the terms "exclusion" and "domination" are defined as follows:

(7) Exclusion
 α excludes β if no segment of α dominates β.
(Chomsky, 1986b, p. 9)

(8) Domination
 α is dominated by β only if it is dominated by every segment of β. (Chomsky, 1986b, p. 7)

To define the notion of "barrier" used in the definition of government, we first define "Blocking Category" (BC):

(9) α is a BC for β iff
 (i) α dominates β
 (ii) $\alpha = \overline{X}$
 (iii) α is not L-marked, and
 (iv) α does not m-command the antecedent of β
(Fukui and Speas, 1986, p. 27)

Based on the notion "Blocking Category", we define the notion of "barrier":

(10) α is a BARRIER for β iff (i) or (ii)
 (i) α is a BC for β
 (ii) α immediately dominates a BC for β
(Fukui and Speas, 1986, p. 27)

The notion of "L-marking" in (11) is defined in terms of θ-government:

(11) L-marking
 α L-marks β iff α is a lexical category that θ-governs β.
(Chomsky, 1986b, p. 15)

(12) θ-government
 α θ-governs β iff α is a zero-level category that θ-marks β, and α, β are sisters.
(Chomsky, 1986b, p. 15)

We furthermore assume that "government" meets the Minimality Condition:

(13) Minimality Condition
 In the configuration: $\ldots \alpha \ldots [_\gamma \ldots \delta \ldots \beta \ldots]$, α does not govern β if γ is a projection of δ excluding α and γ immediately dominates β.
(Chomsky, 1986b, p. 42)

Thus, what the minimality condition on government claims is that δ "protect" β from government by α even though γ may not be a barrier or even $\overline{X}$. Thus, we extend the concept of barrier to include the following case for the theory of government but not for the theory of movement [3]:

(14) γ is a BARRIER for β if γ is the immediate projection of δ, a zero-level category distinct from β.
(Chomsky, 1986b, p. 42)

3. Licensing Conditions for Functional Categories

The recent development of a modular approach to phrase structure enables us to license a lexical category and its projections without recourse to the categorial component. No one, though, has directed serious attention to the treatment of functional categories, i.e. COMP and INFL, along this line. In Chomsky (1981), for instance, these two elements are still licensed by the following phrase structure rules:

(15) a. $\bar{S}$ -> COMP - S
b. S -> NP - INFL - VP
(Chomsky, 1981, p. 52)

Although phrase structure rules (15)(a) and (b) are sufficient to describe the distribution of COMP and INFL respectively, they have no explanatory value. This is because (15)(a) merely stipulates that COMP requires S as its sister node and $\bar{S}$ as its mother node, and (15)(b) that INFL requires NP and VP as its sister nodes and S as its mother node. Even under the system of category projection proposed in Fukui (1986), Fukui and Speas (1986), and Speas (1986), the situation does not improve so much, since the distribution of COMP and INFL are determined by phrase structure rules of the sort (16)(a) and (b) respectively:

(16) a. $\bar{C}$ -> C - $\bar{I}^{i}$ i = 1 or 2
b. $\bar{I}$ -> I - $\bar{V}$

We can make a parallel objection against the phrase structure rules in (16), arguing that the licensing of COMP and INFL through these phrase structure rules is simply a stipulation, and thus has no explanatory value.

One might argue that it is not phrase structure rules like (16)(a) and (b) but subcategorization or c-selection in Grimshaw's (1979;1981) and Pesetsky's (1982) terms that licenses COMP and INFL; COMP subcategorizes for or c-selects a projection of INFL, i.e. $\bar{I}$ or IP, and INFL subcategorizes for or c-selects $\bar{V}$. This counterargument would crumble, however, since if we take this position, we are forced to admit that some categories subcategorize for or c-select complements independently of how they themselves are lexically filled, which is contrary to the widely-accepted view that categories subcategorize for or c-select different complement structure depending on the lexical item. Thus, the claim that COMP and INFL are licensed through subcategorization or c-selection could be retained only at the expense of making subcategorization and c-selection less restricted. Given the explanatory inadequacy of a phrase structure origin for the restricted distribution of COMP and INFL, this section makes an attempt to state licensing conditions for COMP and INFL without recourse to phrase structure rules. Toward this end, we will begin the discussion of licensing conditions which hold of PF and LF.

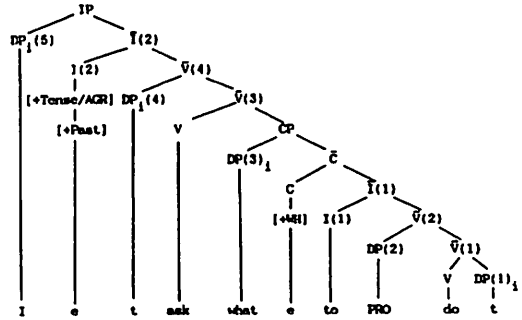
Chomsky (1986a) claims that PF and LF provide an interface with other cognitive systems than the linguistic system: systems of language use. LF representations must be accessible to the semantic system; PF must be accessible to the articulatory and auditory systems. He argues that in virtue of their status as links to these "external" systems, PF and LF are subject to various constraining principles. The most general of these is the Principle of Full Interpretation:

(17) Principle of Full Interpretation (FI)
Every element of PF and LF must receive an appropriate interpretation.
(Chomsky, 1986a, p. 98)

What this principle claims is that all elements which appear at PF and LF must be interpretable in the particular system to which the level in question, PF or LF, provide a link. This principle prevents any elements, i.e. any phonetic segments, in the PF representation of a sentence which do not show up in the uttered string. Similarly, no vacuous elements may appear in the LF representation of any expression. Each element at LF, i.e. each maximal projection category, must be licensed either as an argument, the trace of an argument, a predicate, a modifier, or an operator. There are, however, some elements at LF, i.e. some maximal projection categories, which have hitherto been left out of consideration how to license: the maximal projection category of COMP or INFL and the maximal projection node (the top node) of a lexical category. The discussion to follow will illustrate the fact that explicating the way how to license these two sorts of elements at LF, in fact, amounts to stating licensing conditions for COMP and INFL.

As an illustration, consider the following structure:

(18)



Structure (18) contains twelve maximal projection categories: IP, $\bar{V}$(4), $\bar{V}$(3), DP(5), DP(4), CP, $\bar{I}$(1), $\bar{V}$(2), $\bar{V}$(1), DP(3), DP(2), and DP(1), which the FI would require to be licensed in one of the ways mentioned above. DP(5), DP(3), and DP(2) are licensed as an argument, DP(4) and DP(1) as the trace of an argument, and $\bar{V}$(3) and $\bar{V}$(1) as a predicate. So far, so good. How would the maximal projection categories of COMP and INFL (i.e. IP, CP, and $\bar{I}$(1)), and the maximal projection nodes of lexical categories (i.e. $\bar{V}$(4) and $\bar{V}$(2)) be licensed? Let us first consider the maximal projections of COMP and INFL. CP is licensed in a familiar fashion; it is licensed as an argument of the verb *know*. The problem is how to license IP and $\bar{I}$(1), which are neither an argument, nor the trace of an argument, nor a predicate, nor a modifier, nor an operator. Our recourse is to hold that although IP and $\bar{I}$(1) are not arguments in themselves, their heads agree with (the head of) an element which is externally licensed as an argument. I(2), the head of IP, agrees with the argument DP(5) in its specifier position, which is considered as an instance of "Spec-head" agreement. Furthermore, on the supposition that COMP agrees with INFL (that-[+Tense/AGR] vs. *for*-[-Tense], etc.), "Head-head" agreement holds between I(1) and C, the head of the argument CP. Thus, the maximal projection category of a functional category may be either licensed externally as an argument, the trace of an argument, or a modifier, or licensed indirectly through its head being in agreement relation with (the head of) an externally licensed element. Turning now to the top node of a lexical category, it is entirely conceivable that the notion "clause" is added to the repertoire of the way how to license an element at LF, since "clause" is an LF notion just like "argument", "predicate", "modifier", and "operator." We presume that an element is licensed as a clause if it is governed by INFL. INFL is assumed to contain a bundle of features for tense as well as AGR, i.e. a bundle of features for person, number, gender. Government, as a special case of c-command, implies scope. Hence, this licensing condition seems entirely natural, since it is common to treat tense as an operator with a clausal scope. If this conjecture is correct, $\bar{V}$(4) and $\bar{V}$(2) in structure (18) are licensed as a clause; they are governed by INFL(2) and INFL(1) respectively [4].

On the basis of the foregoing discussion, we posit the following licensing conditions which would provide a non-phrase-structure origin for the distribution of COMP and INFL:

(19) A functional category is licensed if
(i) its maximal projection category is externally licensed at LF, or
(ii) it agrees with (the head of) an element externally licensed at LF

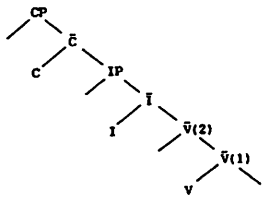
(20) An element is licensed as a clause at LF if it is governed by INFL

In the remainder of this section, we will explicate how these licensing

conditions would only permit well-formed configurations, while filtering out impermissible configurations which would be overgenerated due to the elimination of phrase structure rules introducing COMP and INFL.

Let us first consider the configurations which always satisfy these licensing conditions no matter where they appear:

(21)



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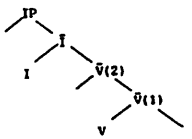


Structures assigned to the bold-faced parts in (23) and (24) would exemplify those configurations given in (21) and (22) respectively:

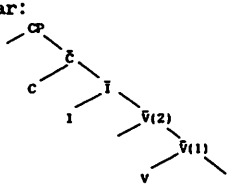
(23) a. **Who did you see?**
b. I can't imagine **what they want.**
c. **Who should do the packing** is still an open question.
(Inoue, et al., 1985, p. 148)
d. This is the house **which we wrote to you about.**

(24) a. **Mary refused the offer.**
b. I think **she might refuse.**
c. I consider **John to be stupid.**
d. ***John to be stupid** is believed by everyone.
e. ***The world is round** is obvious.

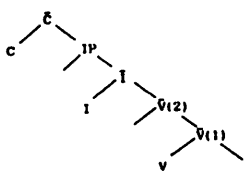
The top node of a lexical category, i.e. $\bar{V}(2)$, is governed by INFL both in (21) and (22); it would satisfy licensing condition (20). What about COMP and INFL? In structure (21), both COMP and INFL are in agreement relation with arguments in their specifier positions, because they assign Kase, [+WH] feature and nominative Case respectively, to them. Thus they satisfy licensing condition (19) regardless of whether CP is externally licensed ((23)(b-d)) or not ((23)(a)). In (22), INFL is licensed either through being in agreement relation with an externally licensed element as in (24)(a), or its maximal projection category being externally licensed as in (24)(b) and (c) [5]. We take it that the ungrammaticality of sentences (24)(d) and (e) results not from the contravention of our licensing conditions but from that of other principles. In (24)(d) the specifier position of IP is not licensed. The ill-formedness of (24)(e) is due to the difficulty in perception [6][7].

Consider now the configurations whose well-formedness depends on where they appear:

(25)



(26)



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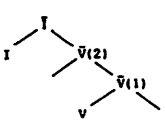
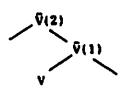


(28)



Structures assigned to the bold-faced parts in (29)-(32) would be taken as examples of the configurations given in (25)-(28) respectively:

(29) a. ***Who to PRO see?**
b. I don't know **what to PRO say.**
c. **How to PRO begin** is now difficult than where to stop.
d. **He is the person to PRO let little things disturb him.**

(30) a. ***That she refused the offer.**[8]
b. ***For you to go there.**
c. **John regrets that she refused the offer.**
d. **I would prefer for Bill to win.**
e. **That the world is round** is obvious.
f. **For you to go there would be silly.**

(31) a. ***To John win.**
b. ***To PRO climb the tree.**
c. John$_i$ seems to t$_i$ be intelligent.
d. John$_i$ is believed to t$_i$ be intelligent.
e. He tried to PRO climb the tree. [9]
f. It is impossible to PRO help John.
g. ***To John win** is certain.
h. **To PRO go there** would be silly.

(32) a. ***John stupid.**
b. ***PRO stupid.**
c. I consider **John stupid.**
d. John$_i$ seems t$_i$ sick.
e. ***I consider PRO stupid.**
f. ***John stupid** is believed by everyone.

Notice that under our proposal, the ungrammaticality of (29)(a), (30)(a) and (b), (31)(a) and (b), and (32)(a) is an automatic consequence, since licensing conditions (19) and (20) would correctly predict that configurations (25)-(28) are ill-formed as structures assigned to matrix sentences although they are well-formed as those assigned to dependent sentences. Let us examine the configurations in (25)-(28) one by one.

In (25), C assigns Kase, i.e. [+WH] feature, to an argument, thus is in agreement relation with it; it would satisfy licensing condition (19). Furthermore, $\bar{V}(2)$ is governed by INFL, thus licensed as a clause. The problem is, however, how to license INFL. Since its maximal projection category, $\bar{I}$, is not externally licensed at LF, it must agree with (the head of) an externally licensed element. The only candidate with which INFL can agree is COMP. Thus, INFL is licensed only if COMP is the head of an externally licensed element. While in (29)(b-d), where COMP is the head of an argument or a modifier, INFL is licensed, it is not in (29)(a), where COMP is not the head of an externally licensed element.

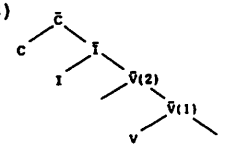
What about (26)? $\bar{V}(2)$ is licensed as a clause, because it is governed by INFL. Since INFL assigns Kase, i.e. nominative Case, to an argument and therefore agrees with it, INFL is licit. COMP, on the contrary, cannot be in any agreement relation with (the head of) an externally licensed element, because the only candidate with which it may agree, i.e. INFL, is not the head of an externally licensed element. Hence, in order for COMP to be licensed, its maximal projection category $\bar{C}$ must be externally licensed. Whereas in (30)(c-f) $\bar{C}$ is externally licensed (as an argument), it is not in (30)(a) and (b), thus the contrast in grammaticality between (30)(a-b) and (30)(c-f) would be predicted.

Consider next configuration (27). $\bar{V}(2)$ in (27) is licensed as a clause since it is governed by INFL. INFL, which is not in any agreement relation with (the head of) an externally licensed element, is licensed only if its maximal projection is externally licensed. While in (31)(c-h) $\bar{I}$ is externally licensed (as an argument), it is not in (31)(a) and (b), thus the ungrammaticality of (31)(a) and (b) would follow. We hold that the ungrammaticality of (31)(g) is not due to our licensing conditions but to Case theory; the DP *John* is not assigned any Case.

In (28), $\bar{V}(2)$ is not licensed as a clause, because there is no INFL which governs it. In (32)(c) and (d), however, $\bar{V}(2)$ is externally licensed not as a clause but as an argument; the well-formedness of these two sentences would result. In (32)(a) and (b), on the contrary, $\bar{V}(2)$ is not externally licensed in any way [10][11]. Although in (32)(e) and (f) $\bar{V}(2)$ is licensed as an argument, this sentence is ungrammatical for other reasons. In (32)(e), PRO is governed by the matrix verb *consider*; it would fall foul of the PRO theorem. In (32)(f), the DP *John* is in a Caseless position; it would violate the Case filter[12][13].

Finally, the configurations which are always ill-formed no matter where they appear are given below:

(33)



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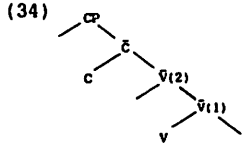

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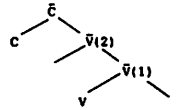

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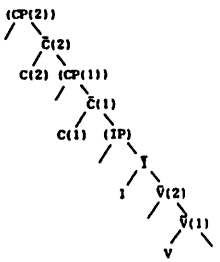

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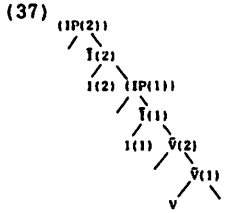


(The categories within parentheses appear if Kase is discharged to their specifier positions) Let us first consider configuration (33). In (33), $\bar{V}$ (2), which is governed by INFL, is licensed as a clause. INFL, whose maximal projection category $\bar{I}$ is not externally licensed, must agree with (the head of) an externally licensed element; the only potential target is COMP. Hence, COMP and INFL are only licensed if the maximal projection category of COMP, i.e. $\bar{C}$, is externally licensed. Although our licensing conditions would predict that configuration (33) is well-formed if $\bar{C}$ is externally licensed, it is, in fact, always ill-formed. This is because there is no suitable lexical item which would fill the C position. Given that no functional category can be left empty as mentioned in note 6, the C position can be filled by either [+WH] feature, or *that*, or *for*. [+WH] feature and *for* would license the specifier position of COMP and INFL respectively. Even though *that* itself does not license any specifier position, "Head-head" (COMP-INFL) agreement requires Kase-assigner, i.e. [+Tense/AGR] feature, to be under the INFL node. Thus the resultant structures would not be something like (33), where the projection of COMP and INFL stops at the single bar level.

In (34) and (35), $\bar{V}(2)$ is not externally licensed in any way; their ill-formedness would result.

Let us next take a case of stacked COMPs with one INFL as in (36). Here, we propose the following licensing condition on COMP:

(38) COMP must agree with INFL which it governs.

This licensing condition might not be unnatural, because as mentioned earlier COMP and INFL must agree, and it is common to impose a locality condition such as government on agreement phenomena. Since COMP(1) governs INFL, it satisfies licensing condition (38). On the other hand, COMP (2) is not licensed, since it does not govern INFL due to the intervening barriers:

(CP(1)) and $\bar{C}(1)$. The barrierhood of CP(1) is self-explanatory. $\bar{C}(1)$ gets the barrierhood because of the minimality condition on government: $\bar{C}(1)$ is a barrier for $\bar{I}$ or IP, and therefore for INFL, since $\bar{C}(1)$ which immediately dominates $\bar{I}$ or IP, is a projection of C(1) excluding C(2).

What about cases where there are stacked INFLs as in (37). We postulate licensing condition on INFL (39):

(39) INFL must govern a clause.

Notice that on the supposition that INFL is a tense-operator with a clausal scope as mentioned above, this licensing condition would be derivable from the general principle that forbids a vacuous operator. Given the validity of this licensing condition, INFL(2) is not licensed. This is because INFL(2) cannot govern any clause due to the intervening barriers: (IP(1)) and $\bar{I}(1)$. The barrierhood of IP(1) is self-explanatory. $\bar{I}(1)$ is a barrier for $\bar{V}(2)$ because of the minimality condition on government; $\bar{I}(1)$, which immediately dominates $\bar{V}$, is a projection of INFL(1) excluding INFL(2). Hence, configuration (37) is ill-formed because INFL(2) does not meet licensing condition (39) [14].

To recapitulate, the discussion in this section has illustrated the effects for the distribution of COMP and INFL of assuming licensing conditions (19-20) and (38-39). We have shown that they would correctly predict the restricted distribution of COMP and INFL, filtering out impermissible configurations if they are overgenerated.

4. Structure of English S

If the foregoing considerations are correct, and if the distribution of the node INFL is determined only by licensing conditions (19), (20) and (39) we would expect that any category may appear as a sister of the node INFL as far as it is interpreted as a clause at LF. This prediction turns out to be entirely correct. Sentences exemplifying the phenomena of INFL's taking a category other than $\bar{V}$ are given in (40):

(40) a. John is foolish.
b. John is under the weather.
c. John is a liar.

Before beginning to analyze the sentences in (40), a morphological property of verbs will be in order. Let us assume that only verbs, but not adjectives, prepositions, nouns, are subject to morphological requirement (41), essentially following Rothstein (1983):

(41) Verbs have a morphological "slot" for an abstract Inflection, and require an abstract Inflection in order to be morphologically well-formed.

Rothstein (1983) argues that evidence supporting this proposal is provided by the fact that there do not exist verbal adjuncts, a fact attested by the following examples:

(42) a. John eats carrots [$_{AP(\bar{A})}$ raw]
b. John sprayed his new car [$_{NP(\bar{N})}$ a brilliant shade of green]
c. We eat strawberries [$_{PP(\bar{P})}$ with cream and sugar]
d. *We like John [$_{VP(\bar{V})}$ run]

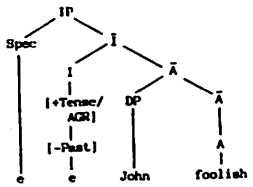
(Rothstein, 1983, p. 148)

On the assumption that adjunct predicates must be uninflected, there is no problem with adjectival, nominal, and prepositional adjuncts, since their heads are not morphologically inflected. A verbal adjunct, by contrast, is prevented by the fact that a verb must be assigned an abstract Inflection in order to be morphologically well-formed, in which case, as an inflected predicate, it is ill-formed as an adjunct. The present and past participle forms of verbs, on the contrary, would behave like adjectives, prepositions, and nouns, rather than verbs, since the morphological "slots" for an abstract Inflection are already filled by the *-ing* and the *-ed* suffix respectively, and therefore there is no problem with their use as adjuncts, as illustrated in (43):

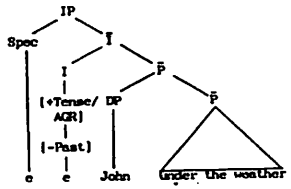
(43) a. We found John at last, [$_{PrtP}$ sleeping in the library]
b. John wrecked the car [$_{PrtP}$ drunk]

Returning to the main issue, according to our analysis, the sentences in (40) would be assigned the following D-structures:

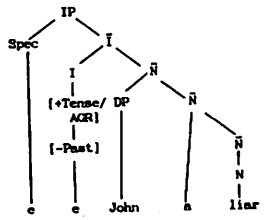
(44) D-structure



(45) D-structure



(46) D-structure

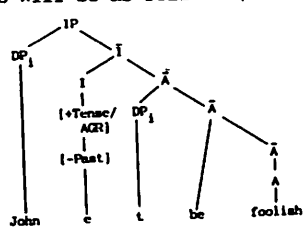


The appearance of copula *be* in sentences (40)(a)-(c) will be accounted for by the adoption of the *be*-support rule [15] (though in some way this rule dates back to earlier works in the late 1960s, such as Bach (1967), Fillmore (1968), Jacobs and Rosenbaum (1968)):

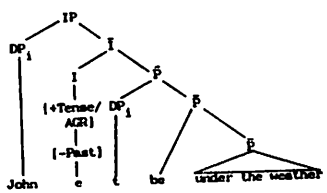
(47) *Be*-support Rule
Adjoin copula *be* to the predicate just in case an abstract Inflection is required, but cannot be assigned to the head of the predicate.

Given that INFL can assign an abstract Inflection to the immediately following clause, which is a sister node of INFL, and subsequently to its head through the percolation convention, in (44)-(46) an abstract Inflection is required by INFL on the clauses *John foolish*, *John under the weather*, and *John a liar*, and therefore on their heads *foolish*, *under*, and *liar*, respectively. On the assumption that only verbs have a morphological "slot" for an abstract Inflection, however, an abstract Inflection cannot be assigned to *foolish*, *under*, and *liar*, their being Adjective, Preposition, and Noun, respectively. Then the *be*-support rule will be employed, and the resultant structures will be as follows (after the application of DP(NP)-Movement):

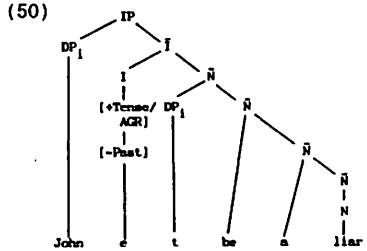
(48)



(49)



(50)



Some phonological rules will convert structures (48)-(50) to their surface forms [16][17].

By contrast to (44)-(46), when $\bar{V}$ appears as a sister of INFL, copula *be* will not emerge. This is because as opposed to adjectives, prepositions and nouns, verbs have a morphological "slot" for an abstract Inflection, and therefore can realize an abstract Inflection assigned by INFL without any support of copula *be*. On the other hand, we should expect that present and past participle forms of verbs need a support of copula *be* in order to realize an abstract Inflection, since morphological "slots" of participle forms of verbs are already filled by the *-ing* or the *-ed* suffix. This prediction is borne out:

(51) a. John <u>is</u> swimming in the pool.
b. The criminal <u>was</u> killed by the police.

To sum up, the discussion above has provided an approach to the structure of a clause in which the requirement that INFL takes $\bar{V}$ as its sister proves to be superficial. Rather we have argued that any category can in fact appear as a sister of INFL as far as it is interpreted as a clause at LF, and copula *be* will be inserted to receive the abstract Inflection assigned by INFL in case its sister is not a $\bar{V}$. Thus, the incorporation of the *be*-support rule together with the morphological properties of verbs into the grammar would enable us to leave unspecified the categorial status of the sister node of INFL.

Apart from its virtue in abandoning the requirement that INFL takes $\bar{V}$ as its sister, our proposal gains additional support from the fact that it would provide a unified theoretical notion of "clause" which holds for small clauses as well as "big" clauses: "clause" is a single-bar level projection of major lexical categories, i.e. $\bar{V}$, $\bar{A}$, $\bar{P}$, and $\bar{N}$ [18]. The only difference between "big" clauses and small clauses resides in the fact that while in the former either COMP, or INFL, or both are attached to clausal expansions, in the latter they are not. Notice that this proposal would follow as a natural consequence of the total elimination of the categorial component, because on the supposition that the LF notion of "clause" is defined in category-neutral terms, we would expect that any category may project to form a clause.

The claim that "clause" is a single-bar level projection of major lexical categories, however, is incompatible with the two prevalent analysis of "clause" within X-bar Theory: "clause" = IP analysis and "clause" = V^{max} analysis. The former analysis is adopted in Chomsky (1986a;1986b), Pesetsky (1982), and Stowell (1981); the latter is adopted in Emonds (1985), Halitsky (1975), Jackendoff (1977a;1977b), Koster (1978), Marantz (1978;1979;1980), Nakajima (1982a;1982b), van Riemsdijk (1978), and Williams (1975). There are, however, some difficulties connected with these two analyses. The central difficulty with "clause" = IP analysis stems from the fact that it asserts INFL to be a head of "clause." X-bar Theory claims that the presence of a head term is obligatory while that of non-head terms is optional. Thus, "clause" = IP analysis would predict that within a clause only INFL must appear obligatorily, but not other elements. This would undermine the

credibility of that analysis, since there exists no clause which consists of INFL alone. Such a problem will not arise under "clause" = V^{max} analysis. This is because "clause" = V^{max} analysis would claim that within a clause a verb alone, namely a predicate alone, must appear obligatorily, but not other elements. Furthermore, on the supposition that the subject of a clause is required by the rule of Predication, this analysis would predict that a phrase will be interpreted as "clause" if it contains a verb, i.e. a predicate, and its subject. This prediction is borne out, since there exists "clause" which comprises a verb and its subject alone: a small clause. A defender of "clause" = V^{max} analysis, however, would be required to account for the asymmetry between categories: why verbs, but not adjectives, prepositions, and nouns, project up to form a clause. One might argue that this asymmetry will follow from the fact that verbs can be assigned an abstract Inflection whereas adjectives, prepositions, and nouns cannot. According to the proposal put forward here, however, this argument crumbles, since categories other than verbs can also be assigned an abstract Inflection through the help of copula *be* which functions as an Inflection-bearer. Thus, our proposal is more plausible than "clause" = V^{max} analysis as well as "clause" = IP analysis in that (i) it would correctly predict that the obligatory element within a clause is a predicate and the rule of Predication would guarantee the obligatoriness of its subject (ii) every major lexical category, V, A, P, and N, may project up to form a clause.

This conclusion is partially overlap with Stowell's (1981;1983) in that small clauses have the categorial status of XP ($\bar{X}$) (though he does not develop any extension of the analysis to "big" clauses). He argues that evidence supporting his contention would come from subcategorization facts.

(52) *I consider [$_{PP}$ John off my ship]
(53) *I expect [$_{AP}$ that sailor very stupid]
(54) a. *We feared [$_{AP}$ John very stupid]
b. *We feared [$_{PP}$ John off my ship already]
(Stowell, 1981, p. 259)

However, we are advised of the spuriousness of this argument by the existence of the following sentences:

(55) a. Unfortunately, our pilot considers [$_{PP(\bar{P})}$ that island off the route]. (Kitagawa, 1985, p. 212)
b. I consider [$_{PP(\bar{P})}$ John in a filthy mood]
c. You consider [$_{PrtP}$ him talented]
(56) I expect [$_{AP(\bar{A})}$ that man dead by tomorrow]
(Kitagawa, 1985, p. 212)

These data would suggest that restrictions on complement selection as in (52)-(54) cannot be accounted for in purely categorial terms. Thus, the argument that Stowell (1981;1983) put forward cannot be adopted to support the claim that the categorial status of small clauses is XP($\bar{X}$). On the contrary, our proposal would require small clauses to have the categorial status of $\bar{X}$(XP) not because of subcategorization facts, but because of the fact that every clause has the categorial status of $\bar{X}$.

5. Conclusion

This study has attempted to account for the distribution of COMP and INFL without recourse to any phrase structure rules. Since we do not posit any phrase structure rules introducing them, we expect COMP and INFL to be overgenerated. The discussion of section three has shown that licensing conditions (19-20) and (38-39) solve such an overgeneration and correctly predict the restricted distribution of COMP and INFL. In the case of a projection of COMP and INFL, most of the properties which used to be stipulated in the categorial component are now accounted for in a modular fashion by other components of the grammar. The only remaining principle in the categorial component is the condition that every phrase is endocentric. Note that in the case of lexical category projection, the saturation theory

proposed in Speas (1986) would enable us to totally eliminate the categorial component. The saturation theory does not work in the case of functional category projection, however, since, as opposed to lexical categories, functional categories do not bear categorial features or θ-grids. We have argued in section four that INFL can in fact take any category as its sister as far as it is interpreted as a clause at LF, which is contrary to the traditional assumption that INFL can take only a projection of V as its sister. If categories other than a projection of V appears as the sister of INFL, copula *be* will be inserted to realize an abstract Inflection assigned by INFL. This proposal enables us to provide a unified theoretical notion of "clause" which holds for small clauses as well as "big" clauses: "clause" is a single-bar projection of major lexical categories.

It is doubtless that there are many more cases where analyses on the basis of the non-existence of the categorial component do not work well. It would be easy to say that assumption of dismantling the categorial component would be throwing out the baby with the bath-water. However, such a reaction is misguided given the modular structure of the overall grammatical model. One should not retain the categorial component if it raises difficulties, but rather pursue alternative analyses which dispense with the categorial component by virtue of interaction of other components of the grammar. It is to the development of such a theory that the present study is meant to make a contribution.

NOTES:

*This is based on a paper read at the 1st Tokyo Linguistics Forum held at International Christian University on August 27, 1986. I am grateful to Professors Kazuko Inoue and Masatake Muraki for their valuable comments and suggestions on the earlier version of this paper. All remaining inadequacies, needless to say, are my own.

1. We will refer this proposal to the structure of a clause as the "Subject Raising" approach. Similar proposals have been suggested in Kitagawa (1986), Koopman and Sportiche (1986), Kuroda (1986), and Zagona (1982).

2. This idea is also adopted by Belleti and Rizzi (1981) and Aoun and Lightfoot (1984).

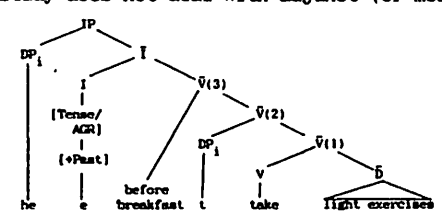
3. Chomsky (1986b) also proposes a broader formulation of the minimality condition on government.

(i) γ is a BARRIER for β if γ is a projection of δ, a zero-level category distinct from β.

To make a choice between these two formulations is beyond the scope of this study. In the following discussion we will assume the narrower formulation (14).

4. This study does not deal with adjunct (or modificational) structures as in (i):

(i)



The question to be addressed at this point is how to license $\bar{V}(3)$ and $\bar{V}(2)$ in (i). We argue that both $\bar{V}(3)$ and $\bar{V}(2)$ are licensed as a clause. The government of $\bar{V}(3)$ by INFL is self-explanatory. According to the definition of government (4), $\bar{V}(2)$ is also governed by INFL, since it is the head of the governed element $\bar{V}(3)$.

5. INFL in the bold-faced part of (24)(b) is also licensed through

being agreement relation with the argument DP *she*.

6. We claim that a functional category, as opposed to a lexical category, cannot be left empty; it must contain either a lexical item, such as *that*, *for*, *to*, or a functional feature, such as [+WH], [+Tense/AGR]. Thus, the underlined parts in (24)(a) and (b), for instance, are assigned the categorial status of IP, which is contrary to the traditional assumption that they are assigned the categorial status of $\bar{C}$ or CP. This proposal has a certain appeal stemming from the fact that the presence of empty categories is only required by the Projection Principle, which states informally that every syntactic representation should be a projection of lexical property. For example, on the assumption that it is specified in the lexicon that the verb *call* takes a subject and a DP complement, we are forced to posit an empty category in the subject position of the embedded clause in (i), otherwise it would violate the Projection Principle:

(i) Mary tried [to PRO call Jane].

On the contrary, the Projection Principle does not require us to posit the presence of empty functional categories either in (24)(a) or (b). Self evidently, the matrix clause COMP position in (24)(a) is not forced by the Projection Principle. Furthermore, let us assume that the verb *think* takes a clausal complement, whose syntactic category realization is either "big" clauses, i.e. CP, $\bar{C}$, IP, $\bar{I}$, or small clauses, i.e. $\bar{V}$, $\bar{A}$, $\bar{P}$, $\bar{N}$. If this conjecture is correct, the presence of an embedded clause COMP position is not forced by the Projection Principle, either.

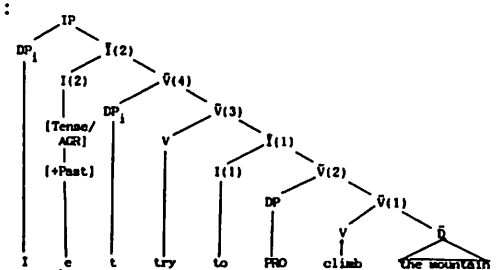
7. The present study assumes that exceptional Case-marking verbs, such as *believe*, *consider*, license the specifier position of their IP complement through assigning Kase, i.e. objective Case, to it as in (24)(c). This option is, however, only granted when the head of IP complement does not contain [+Tense/AGR] feature, otherwise an ungrammatical sentence such as (i) would result:

(i) *I think her might refuse.

8. This observation was suggested to the author by Naoki Fukui (personal communication).

9. This study assumes the PRO theorem, which states that PRO must be ungoverned. Let us briefly examine how it works in the case of PRO in (31)(e). Under the present analysis, associated with sentence (31)(e) would be structure (i):

(i)



The verb *climb* does not m-command PRO, since the maximal projection category V(1) which dominates the verb *climb* does not dominate PRO, thus the verb *climb* does not govern PRO. The verb *try* does not govern PRO due to the intervening barrier $\bar{I}(1)$. $\bar{I}(1)$ gets its barrierhood because of the minimality condition on government (14). Although there is no intervening barrier between I(1) and PRO, I(1) does not govern PRO. This is because functional categories, as opposed to lexical categories, are unable to govern across a maximal projection category to the right (cf. Fukui (1986)).

10. Possible counterexamples are sentences like (i) and (ii):

(i) a. Mine a yellow face?
b. She a beauty!

(ii) a. Max (still) afraid of flying? That's laughable.
b. Fred in prison (again)? That's shocking.
c. Mexico City (currently) the world's largest city? Are you kidding? (McCawley, 1983, p. 285)

Sentences like (i) and (ii) are often used to express one's emotion.

11. The ungrammaticality of the (a) examples in (31) and (32) also follows from the Case theory; the DP *John* is in a Caseless position.

12. Possible counterexamples are sentences like (i), where a small clause occur in the subject position:

(i) [Workers angry about the pay] is just the sort of situation that the ad campaign was designed to avoid. (Safir, 1983, p. 732)

There is simply too little evidence to establish any motivated system for handling this fact. For the purpose of this study, we tentatively conclude following Safir (1983) that the small clause in (i) is an "honorary" DP (NP) in a subject position (especially in a copula construction), though it is not a DP (NP) in any other context.

13. According to the present analysis, we should expect that a small clause the subject of which is PRO appears in the subject position of a clause. But, this prediction is not borne out:

(i) *[PRO bashful] would be a shame. (Williams, 1983, p. 295)

A possible solution is to assume that functional categories can govern across a maximal projection category to the left, though they cannot to the right, which might be related to the fact that functional categories assign F-features uniformly to the left. If this hypothesis is correct, the ungrammaticality of (i) follows; PRO is governed by INFL.

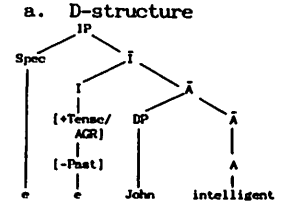
14. Given licensing condition (20), one is forced to the unfortunate conclusion that the maximal projection category of INFL(1) in (37), i.e. $\bar{I}$ (1) or IP(1), is governed by INFL, and therefore licensed as a clause. This difficulty is resolved by assuming that the maximal projection category of a lexical category alone, not that of a functional category, may be licensed as a clause.

15. A similar analysis is proposed in Rapoport (1985) and Rothstein (1983).

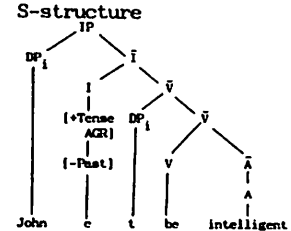
One might argue that *be*-support analysis is impossible within the X-bar syntax, because under this analysis, sentence (i) would be analyzed as in (ii):

(i) John is intelligent.

(ii) a. D-structure



b. S-structure



Since in (ii)(b) *be* is the head of the clause, it is a verbal clause. But underlyingly, it is an adjectival clause. Thus, the *be*-support rule cannot exist as it changes category label.

This argument is subverted, however, since we assume here that copula *be* functions simply as an Inflection bearer, and therefore it is Chomsky-adjoined to the predicate. Thus, at S-structure also the adjective *intelligent*, not copula *be*, is the head of the clause *John is intelligent*.

16. We posit a dual function of so called "determiners": they may function as binders, as suggested in Higginbotham (1985a), Rothstein (1983), and Williams (1984), or as modifiers. Thus, while in (i) the "determiners"

a and *the* function as binders, in (ii) they function as modifiers:

(i) a. [$_{\bar{D}}$ A good doctor] joined the clinic.
b. [$_{\bar{D}}$ The chief] had power of life and death over subjects.

(ii) a. We consider him [$_{\bar{N}}$ a good doctor].
b. I consider Mary [$_{\bar{N}}$ the chief].

17. We assume here that the *be*-support rule applies prior to S-structure. However, it is also conceivable that copula *be* appears at D-structure. The principle (i) excludes structures in which categories other than $\bar{V}$ appears as the sister of INFL and copula *be* is not adjoined to the predicate.

(i) A predicate must realize an abstract Inflection when it is assigned to the head of the predicate.

In this study, we posit the *be*-support rule for expository purposes.

18. A possible counterexample to this proposal would be sentences such as (i) where a clause is used as a predicate:

(i) a. It is that John's tired. (in answer to, *e.g.* what's the matter?) (Rothstein, 1983, p. 139)
b. The house is to let.
c. I have been much to blame.
d. She murmured that the reason was not far to seek.

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