1. Introduction

The concept of auxiliary verb has not yet received a solid basis, either in traditional or in generative grammar. Whereas in traditional grammar, the concept remained rather intuitive and semantically based, generative grammar has usually taken a narrow syntactic tack, restricting the concept mainly to well-known English verbs which show restricted syntactic behavior. Various questions have remained obscure, sometimes even in spite of extensive discussion. To mention just one of these, the semantic distinction between epistemic and deontic modality has often been mapped out syntactically in terms of a distinction between subject raising and control (Équiv), while the corresponding verbs in English, such as can, have been analysed as AUX or INFL elements taking VP complements.

In this paper, we attempt to explore the concept of auxiliary verb more thoroughly. Our examination shows that there are many problems that have never received a satisfying treatment. As is to be expected, we will not succeed in solving all these problems either. Rather we present the outline of an approach which seems promising to us, sufficiently so as to suggest that further research along these lines is warranted.

The topic of auxiliary verbs belongs to the domain of verb complementation. The typical model of verb complementation has been that of S' or S (CP or IP) and one might well attempt to extend this model to cover the complement structure of auxiliaries as well. However, English modals provide an alternative complementation model, that of VP. It is this model that we want to explore more fully.

* We are grateful for comments on an earlier version of this article from A. Hulk, R. Kayne, A. Rouveret, M.-T. Vinet and A. Zribi-Hertz.
It should be noted that the notion of VP complement is not necessarily at odds with the actual syntactic status of a particular syntactic complement as CP. If we adopt Chomsky’s (1986) notion of sister, which holds that intervening non-lexical projections are irrelevant for determining sisterhood, the VP embedded in a syntactic CP complement is in fact a sister of the verb governing the CP, both CP and IP being non-lexical projections. Hence even under those circumstances, a matrix verb lexically takes a VP complement. We shall not propose that each CP complement should be construed as a VP complement. Rather, the construal of a complement at LF is determined by the functional categories (if any) intervening between the matrix verb and the lexical VP of its complement. We call this Functional Determination of Categories (FDC). In general, a projection is construed as nominal or verbal (ultimately as argument or predicate) not solely on the basis of the categorial value of its head, but by its syntactic context, as defined in (1):

\[(1)\] Functional Determination of Categories

a. external.
   An XP is construed as a nominal projection if it is casemarked.
   An XP is construed as a verbal projection if it is T-marked.

b. Internal.
   The subject of a nominal projection receives a Case which is determined internal to XP; the subject of a verbal projection receives Case (if any) determined by an external governor.

Nominal projections are interpreted as arguments, whereas verbal projections function as (parts of) complex predicates. Arguments, then, are Case-licensed. Their independence is internally brought out by the fact that if they have an internal subject, this subject is licensed independently from the syntactic context in which it appears. This is the case for NPs with genitive subjects, but it is also true for tensed complements, where the embedded tense licenses the subject of the complement internally with nominative Case. In contrast, if the subject of a complement is licensed from the outside, the complement is in that sense not entirely autonomous.

The notion of T-marking employed in (1a) stands for Tense-marking, which we discuss more fully in Section 4. Typically, but not exclusively, verbs are the scope bearing elements of Tense. A complete functional complex headed by a verb denotes, in the general case, an event, which is situated in time by a tense – operator. Verbs, then, are T-marked. Auxiliary verbs do not denote an event, but rather modify the denotation of a VP. They are therefore not capable of absorbing the Tense value, which they pass on to the
head of their VP complement. We can thus partially define the distinction between auxiliary verbs and lexical verbs as in (2):

(2) An auxiliary verb governs a verbal projection; a non-auxiliary, or lexical, verb governs either a nominal or a verbal projection.

1.1 FDC

The FDC accounts for the fact that a non-finite X node is not necessarily interpreted as nominal or verbal in all contexts. For example, le médecin is construed in LF as a nominal projection in (3) but as (an integral part of) a verbal projection in (4). This constituent manifests nominal properties such as agreement between its head and its specifier or the possibility to function as antecedent for a non-restrictive relative when case-marked as in (3), but not when it lacks case-marking and is instead T-marked by an auxiliary as in (4):

(3) Le médecin, qui me traite depuis longtemps, est bon.
(The doctor, who has been treating me for a long time, is good).

(4) a. Jean est médecin.
"John is a doctor."
b. "Jean est médecin, qui me traite depuis longtemps.

Similarly, IP is construed in LF as a nominal projection nondistinct from NP when assigned case by Inf, V or P, but as a verbal projection non-distinct from VP when governed by an auxiliary verb.

1.1.1 The Construal of Infinitives

Change of category with change of syntactic context is illustrated by the inflected infinitive in European Portuguese (EP). The inflected infinitive is construed as a nominal projection when case-marked by inflection as in (5) or by a verb as in (6). And in both (5) and (6), the inflected infinitive manifests the internal nominal property of case assignment via Inf - subject agreement, in conformity with (1):

(5) [IP Eles aprovarem a proposta] será difícil.
(they approver+agreement the proposal will be difficult)

(6) Eu vi [IP eles roubaram o livro].
(I saw they steal+agreement the book)
Raposo (1987) already proposed that the subject of an inflected infinitive IP is case-marked only if IP itself is case-marked. Raposo suggests that the case assigned to IP percolates to I which transmits it to its subject, within a chain. In our framework, case-marking on IP merely identifies IP as a nominal projection, assigning it a structural “address” in the sense of Vergnaud (1982). While assignment of nominative case to the subject of IP under subject-AGR agreement ensures a coherent interpretation of IP as a nominal projection, this process is syntactically independent from case assignment to IP itself. If it were otherwise, one could not account for the fact that the subject of the inflected infinitive is always assigned nominative case while IP itself may be assigned nominative case, as in (5), or accusative case, as in (6). The non-identity of the two cases assigned in (6) makes the chain hypothesis problematic, as Raposo (1987) notes.

The criteria in (1) identify the inflected infinitive in (7a) as a nominal projection and that in (7b) as a verbal projection:

(7)

a. Eu lamento [XP os deputados terem trabalhado pouco].
   (I regret the deputies to have+agr worked little)

b. Eu lamento [XP terem, [XP os deputados t, trabalhado pouco]].
   (I regret to have+agr the deputies worked little)

(8) below, from Raposo (1987), shows that lamentar is a case assigner:

(8) Nos lamentamos [NP os pedidos dos Jesuitas].
   (We regret the requests of the Jesuits)

Following Raposo, we propose that lamentar assigns case to its complement XP in (7a). Case marking on IP identifies it as a nominal projection. We assume that the inflected Infl of EP contains a tense morpheme which assigns nominative case to the subject of (7a) via subject-Infl agreement.

In (7b), however, lamentar, whose case F we assume to be optional, does not assign case to XP. This follows if a nominal XP always contains a specifier in EP: in (7b), terem, the head of XP1, has no specifier to its left. Since case assignment to XP1 in (7b) would force a nominal construal, XP1 may not be assigned case. Assuming further that NP and VP exhaust the possible construals of a non-finite XP, XP1, must be VP.

According to (1), VP is identified by T-marking by Tense or an auxiliary verb. We propose that in (7b), the auxiliary verb terem raised from XP2 T-marks XP2 and identifies it as a verbal projection.
Since terem is the head of both XP₁ and XP₂, XP₁ and XP₂ are analysed as two segments of the same VP (cf. Chomsky 1986). The abstract tense morpheme of the raised auxiliary terem assigns its nominative case to os deputados by government, not by agreement, satisfying (1b).

We do not deny that (7b) instantiates the process of Aux-to-Comp movement proposed in Rizzi (1978) and (1982) for Italian and adopted for EP by Raposo (1987). We claim rather that CP itself is identified as either a nominal or a verbal projection in LF (cf. Kayne 1982). (7b) is associated with the S-structure (9a), interpreted as (9b) in LF:

(9)    a. Eu lamento [CP terem, [NP os deputados t₁, [VP trabalhado pouco]].
       b. Eu lamento [VP₁ terem, [NP₂ os deputados t₁, [VP₂ trabalhado pouco]].]

Raposo cites (10) to show that the epistemic verb pensar is not a case assigner. It would then follow that pensar cannot generate a structure like (7a), as shown in (11), but only one like (7b), shown in (12):

(10)    *O Manel pensa [NP os pedidos dos Jesuitas].
        (M. thinks the loss of the Jesuits).

(11)    *Eu penso [XP os deputados terem trabalhado pouco].
        (I believe the deputies to have+agr worked little)

(12)    Eu penso [XP₁ terem, [XP₂ os deputados t₁, trabalhado pouco]].
        (I believe to have+agr the deputies worked little)

Raposo proposes that pensar takes a CP complement in (12), on analogy with (13):

(13)    O Manel pensa [CP que eles recebiam pouco dinheiro].
        (M. thinks that they received little money)

¹ (9a) and (9b) should not be confused with parallel structures, which we criticize in Section 2. on theoretical and empirical grounds. While parallel structures are syntactically distinct, (9a) and (9b) are syntactically identical, differing only in the categorial identity of the complement XP in LF. And while parallel structures pertain simultaneously, (9a) are pertinent on two distinct levels of grammar, S-structure and LF.

² Although terem assigns case by government in (9b), the affix of terem agrees with the subject of VP₂. This disjunction of case assignment and agreement suggests that case is assigned in S-structure while agreement is checked in LF or LF', following reconstruction. The hypothesis that agreement follows reconstruction is
However, this hypothesis does not account for the obligatory presence of an auxiliary verb whenever an infinitive, inflected or not, is embedded under an epistemic verb like pensar (Raposo 1987). An auxiliary is not obligatory in a CP introduced by que such as (13) nor in nominal inflected infinitives such as (5) and (6). Our proposal does account for this surprising constraint. If it does not assign case to its complement XP, pensar cannot identify XP as an NP. The complement cannot be VP either unless it is T-marked by Tense or an auxiliary verb. A tensebearing auxiliary verb must therefore be available to “raise to COMP” as in (9a) or, equivalently, adjoin to VP as in (9b). The auxiliary T-marks VP, identifying it as a verbal projection. In (13), Aux-to-Comp is not necessary because Tense in Infl T-marks VP.

Although factive lamentar and epistemic pensar govern VP like auxiliary verbs, we classify them as lexical verbs, not auxiliaries. For they can alternatively govern a tensed CP to which they assign a theta-role. We assume that a tensed CP obligatorily receives a theta-role. Auxiliary verbs, having retracted or null semantic content, assign no internal theta-roles and consequently do not govern a tensed CP.

The identification of pensar as a lexical verb taking a VP complement suggests that although only NPs have case, both NP and VP may be assigned a theta-role. If so, T-marking counts for visibility as well as case-marking.

Rouveret (1980) points out the parallelism between (12) in EP and Aux-to-Comp structures in Italian as analysed in Rizzi (1978). Persuing this analogy, we propose that (14a) has the S-structure (14b) and the LF (14c):

\[(14)\]
\[
\begin{align*}
\text{a. Suppongo non esser lui in grado di affrontare la situazione.} \\
&
\text{(I suppose not to be he capable of to affront the situation)} \\
\text{b. Suppongo [CP non esser, [IP lui [t in grado di affrontare NP]]].} \\
\text{c. Suppongo [VP, non esser, [VP2 lui [V' t, in grado di affrontare NP]]].}
\end{align*}
\]

If the epistemic verb supporre does not assign case, its complement must be VP, by (1). The auxiliary verb raised to Comp in (14b) or, equivalently, adjoined to VP in (14c), T-marks VP₂, identifying it as a verbal projection. Ettorre being the head of both VP₁ suggested independently by Ss such as Belle, elle l', est et, 'Beautiful, she it is', where the adjective does not have access to the subject with which it agrees until some form of reconstruction applies in LF.
and VP₂, the two verbal projections are construed as two segments of the same projection.

The absence of Ss like (7a) in Italian suggests that the infinitival inflection of the auxiliary verb differs from its counterpart in EP in lacking pronominal agr capable of manifesting phi-features (phi-Fs). This difference is reflected in the infinitival morphology of the two languages. The existence of Ss like (7b) suggests, however, that in Italian as in EP, the infinitival inflection of the auxiliary verb contains an abstract tense morpheme capable of assigning nominative case. In (14c), the auxiliary assigns Nominative case to the SC subject of VP₂ by government, in accordance with (1b).

There is no French analogue to either (7a) or (7b). Regretter being a case assigner, as shown in (15a), the absence of (15b) comparable to (7a) in EP suggests that in French as in Italian, the infinitival inflection lacks a pronominal agr-morpheme. The absence of Ss like (7b), such as (15c), suggests further that in French, contrary to EP and Italian, the abstract tense morpheme of the infinitival affix is too weak to assign nominative case to the subject of its SC complement:

(15)  

a. Il regrette [_{NP} le départ des Jésuites].  
(He regrets the departure of the Jesuits)

b. *Il regrette [_{XP} les députés avoir travaillé peu].  
(He regrets the deputies to have worked little).

c. *Je crois [_{XP} avoir les députés travaillé peu].  
(I believe to have the deputies worked little).

The difference between EP, Italian, and French testify to a pro-drop parameter in the domain of infinitival inflection. The parameter would consist of two sub-parameters, where (ii) plausibly presupposes (i): (i) Infl contains a Tense morpheme strong enough to assign nominative case; (ii) Infl contains pronominal agr. EP is positive for (i) and (ii), Italian for (i) and French for neither.

Surprisingly, French does manifest Aux-to-Comp in wb-structures with epistemic matrix verbs such as croire. (16c) is the LF corresponding to the S-structure (16b):

(16)  

a. Qui crois-tu être venu?  
(Who believe you to be come?)

b. [_{CP} Quiₜ₁ [_{C} croisₜ₁ [_{IP} tuₜ₁ [_{CP} tₜ₁ [cₜ₁ êtreₜ₁ [_{IP} tₜₜ venuₜₜ]]]]]]

c. [_{CP} Quiₜ₁ [_{C} croisₜ₁ [_{IP} tuₜ₁ [_{VP₂} tₜₜ venuₜₜ]]]]

We owe this suggestion to A. Rouveret (p.c.).

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We propose, following Kayne (1984), that in (16b) (the trace of) croyre assigns case to the ec in embedded Spec CP position.

This proposal raises questions with respect to the case assigning properties of epistemic verbs. The argumentation in Raposo (1987) wrt (10) above suggests, given the ungrammaticality of (17a), that croyre is not a case assigner. If it is not, how can it assign case in (16)? If it is, why are (10) and (17a) below ungrammatical?

The data in (17) suggest that croyre is a case assigner:

(17) a. *Je croyais [NP le départ des Jésuites].  
    (I believed the departure of the Jesuits)
b. Je croyais [NP cette histoire].  
    (I believed that story)
c. ?Je croyais [VP Marie partie].  
    (I believed Marie gone)
d. Je croyais [VP Marie aimée de Georges].  
    (I believed Marie loved by Georges)
e. *Je croyais [VP Marie aimée par Georges].  
    (I believed Marie loved by Georges)
f. *Je croyais [VP Marie partir].  
    (I believed Marie leave)
g. Je le crois.  
    (I believe it)
h. Je crois [IP PRO Infl me tromper].  
    (I believe to be wrong)

Croyre assigns case non-problematically to a nominal projection in (17b), (17g) and (17h) and to the subject of a SC in (17c) and (17d). The ungrammaticality of (17a), (17e), and (17f) must then be independent of case theory.

We attribute the ungrammaticality of (17a) to a constraint on the semantic and syntactic distribution of epistemic verbs like croyre:

(18) If the non-finite complement of an epistemic verb such as pensar/ritenere/ croyre etc. denotes an event, then the epistemic verb must govern the tense morpheme of its complement.  

Epistemic verbs share property (18) with auxiliary verbs, which always govern the tense morpheme of a non-finite VP complement.

A similar proposal is made in Raposo (1987). Note that if the tense morpheme of CP is in Comp, then all verbs which take a tensed CP complement would satisfy (18), since V governs CP and its head C. But there is no contrast between croyre, regretter, and vouloir when they take finite complements. Moreover, we do not want the matrix finite tense to govern the finite tense of its complement, incorrectly forming a complex T-chain as described in the text. We will suppose then that tense is in Infl in a finite complement so that C prevents government of the lower tense by the higher tense under minimality.
We propose that (17b-d) and (17g) above are grammatical because (18) does not apply: the complement of *croire* is stative.

(17h) is grammatical because *croire* directly governs IP and the abstract tense morpheme in Infl, the head of IP.

(17a) is ungrammatical because it violates (18): the complement of *croire* denotes an event but lacks a tense morpheme.

(17e) and (17f) do not violate (18). The grammaticality of the Ss of (19) suggests that the tense morpheme of a non-finite VP is accessible to its governor:

(19) a. *J'ai [VP vu Pierre].*  
(I have seen Pierre)

b. *Elle laisse [VP les enfants partir].*  
(She lets the children leave)

We attribute the ungrammaticality of (17e) and (17f) to the impossibility of identifying the complement of *croire* as a VP. In these examples, the embedded VP is not T-marked by tense or an auxiliary verb. In (19), on the contrary, the embedded VP is in each case governed by an auxiliary verb which T-marks it.

In (16b) above, Aux-to-Comp movement in the embedded CP permits the epistemic verb to govern the tense morpheme of its CP complement, satisfying (18). The auxiliary verb T-marks its complement, identifying it as VP in LF, satisfying (1).

*Être* being the head of both VP₂ and VP₁ in (16c), these two projections are construed as two segments of a single VP projection in LF.

In (16b), *croire* assigns case to the trace in Spec CP position. CP being construed as VP in LF, the embedded Spec CP position in (16b) is construed as Spec VP, an argument position, on that level, as in (16c). We propose that it is this construal which permits the case-marked empty category to function as a variable in LF.

If *être* did not raise to Comp, as in (20), in the absence of T-marking, the CP complement would be construed as an NP in LF. *Croire* would obligatorily assign its case F to CP, by (1). Neither the trace in the embedded Spec CP or that in the embedded Spec IP position would be case-marked. Consequently, the embedded clause would contain no variable in LF and *qui* would quantify vacuously, condemning the structure:

(20) [[CP Qui [C: crois, [IP tu t₁ [CP t₁ [C: [IP t₁ [VP être venu t₁]]]]]]]]

*Wh*-extraction of the subject of a non-finite complement is thus a
function of Aux-to-Comp movement in French as in EP and Italian. The one difference is that in the pro-drop languages, the tense morpheme of the embedded auxiliary verb is strong enough to assign nominative case to an ec in embedded Spec IP position, while in French, a non pro-drop language, the tense morpheme of the infinitival auxiliary is too weak to assign nominative case structurally. It is the matrix verb which assigns case to the ec in Spec CP position. Otherwise, (16) in French is equivalent to (9) and (14) in EP and Italian.\(^5\)

If we assume that the ability of an infinitival auxiliary to T-mark the VP it governs presupposes the existence of a tense morpheme in its inflection, then the grammaticality of (16) requires that we assume the existence of a tense morpheme in infinitival auxiliaries in French, even though this morpheme does not manifest itself through nominative case assignment as in EP and Italian.

Pollock (1987) shows that only auxiliary verbs raise to (Infl and) Comp in infinitival Ss. The contrast between (16) and (21) supports our hypothesis that Aux-to-Comp movement applies in (16).\(^6\)

(21)  
\[ \text{a. }^{*}\text{Qui crois-tu venir?} \]
\[ \text{b. [CP Quii} \{C: \text{crois} \{IP tu ti} [C: \text{venir} \{IP ti eq.}]\}\}]\]

Rule (1) accounts in turn for the inability of lexical verbs to raise to Infl and Comp infinitivals. In the absence of finite Tense, only an auxiliary verb can T-mark and identify a verbal projection. As dis-

\(^5\) We thus propose revising Raposo's analysis of (7b) and (14) above in one respect. If epistemic verbs like pensar and ritenere have the same lexical properties in EP and Italian as croire in French, and are associated with a paradigm like (17), then it is not lack of a case F but constraint (18) which triggers Aux-to-Comp in these languages, as in French.

\(^6\) Believe in English is also subject to (18), as shown by the contrast between (i) and (ii), called to our attention by L. Nash-Haran. The obligatory presence of an auxiliary verb in (i) identifies the complement of believe as a verbal projection, identified by T-marking, rather than a nominal projection identified by case-marking:

(i)  
\[ \text{a. Who do you believe to have come?} \]
\[ \text{b. }^{*}\text{Who do you believe to come?} \]

Note that in English, as in other languages, an auxiliary is necessary only if the complement denotes an action. The acceptability of (iii), with a stative complement, is compatible with (18):

(iii)  
\[ \text{Who do you believe to know more languages than Ken?} \]
cussed in Section 4. below, a lexical verb absorbs rather than assigns a T-index.

Our analysis of (16) is compatible with a restricted grammar in which a variable is always in A-position, provided we assume that the same configural position may be construed as an A'-position in syntax and as an A-position in LF.7

The hypothesis that Spec CP may be construed as an A-position in LF is independently supported by contrasts such as that in (22), noted in Rizzi (1982) for Italian and Kayne (1984) for French:

(22)  a. ?Je le démontre être le plus intelligent.
    b. ?Je le crois être le plus intelligent.
    (I him demonstrate/believe to be the most intelligent)

We associate (22a) with structure (23) and (22b) with the S and LF structures (24a) and (24b), respectively:

(23)  Je lei démontre [CP [IP ei être le plus intelligent]].
(24)  a.  Je lei crois [CP t[CP êtrei [IP ei t[IP ei être le plus intelligent]]]]
    b.  Je lei crois [VP t[VP êtrei [VP ei t[VP ei être le plus intelligent]]]]

In (23), démontrer assigns case to CP, which functions as a barrier for clitic climbing, as discussed below. In (24a), the auxiliary verb être raised to Comp T-marks IP, with IP and CP construed as two segments of a VP projection in LF, as shown in (24b). Spec CP, an A'-position in syntax, is construed as Spec VP, an A-position, in LF, allowing the ec in Spec CP to function as a trace. The syntactic construal (24a) accounts for the marginality of (22b), where a clitic binds an A'-position, while its LF construal (24b) accounts for its neargrammaticality.

Causative verbs, unlike epistemic verbs, cannot govern an auxiliary-headed VP:

(25)  a. Je fais [VP travailler Marie]]
    b. ?Je fais [VP avoir [VP travaillé Marie]]

7 Our analysis of complements of croire in French may extend to those of danna “believe” in classical Arabic. Danna assigns accusative case to an NP in Spec IP position. Although Spec IP is an A' topic position in Arabic, it is nevertheless from this position that NPs are extracted under wh-movement. The ability of an ec in Spec IP to function as a variable for a wh-operator would follow from the construal of an IP governed by danna as a VP in LF under the FDC in (1); the Spec VP position is clearly an A-position in Arabic.

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(26)  a. I made [VP Mary work]
    b. *I made [VP Mary be working].

The inability of faire and make to govern an infinitival complement headed by an auxiliary would be surprising if causatives were lexical verbs taking a CP complement, for lexical verbs have no access to the auxiliary structure of their complement. It is not surprising if, as we claim, causative verbs are auxiliaries of the same class as BE. It is independently necessary to formulate constraints on sequences of auxiliaries within a single tense domain. In our framework, the ungrammaticality of (25b) and (26b) is accounted for on the same basis as that of the Ss of (27): auxiliary verbs with the same syntactic function are in complementary distribution:

(27)  a. *Il est été vu.
    b. *He is been seen.

Causative verbs, again unlike epistemic verbs, allow adjunction of an embedded lexical verb to the VP which dominates it, as in (28):

(28)  a. *Je crois [VP1 chanter, [VP2 Marie t1]].
      (I believe to sing Marie)
    b. Je fais [VP1 chanter, [VP2 Marie t1]].
      (I make to sing Marie)

The contrast in (28), like that between (16) and (25b), is accounted for by the hypothesis that causative verbs are auxiliaries. (28a) is ungrammatical because the lexical verb croire cannot T-mark its VP complement. (28b) is grammatical because the causative verb is itself an auxiliary and a T-marker.

1.1.2 The Construal of PPs

We propose that a PP with a lexical P head is construed as a verbal projection in LF when it is ungoverned or governed by V. We distinguish independent P from dependent P. An independent P heads a verbal projection which functions as an adverbial, or secondary predicate. A dependent P extends the syntactic domain of the verb which governs it. A dependent P governs a nominal projection if it assigns case to its complement, like to in (29), and a verbal projection if it does not assign case, like to in (30):
(29)  a. Mary speaks to John.
b. Mary speaks \([p_p \text{ to } \{NP \text{ John}\}]\).

(30)  a. Mary will have to leave.
b. Mary will have \([p_p \text{ to } \{VP \text{ leave}\}]\).

In (31) below, \textit{to} depends on \textit{believe}, its governor. We propose that here \textit{to} functions as an inflectional Tense morpheme which T-marks \textit{have} and permits \textit{have} to T-mark in turn the embedded lexical VP. Government of the prepositional tense morpheme by \textit{believe} satisfies (18). \textit{Believe} assigns case to the subject of the PP it governs. In LF, PP is construed as VP and the three VPs in (31c) are interpreted as three segments of a single verbal projection. (31c) is thus structurally parallel to (9b), (14c), and (16c) above in EP, Italian, and French:

(31)  a. I believe John to have left.
b. I believe \([p_p \{NP \text{ John} \} \{VP \text{ t} \text{, have \{VP \text{ t} \text{, left}\}}\}]\).
c. I believe \([VP_1 \text{ John} \{VP \text{ t} \text{, have \{VP_2 \text{ t} \text{, have \{VP_3 \text{ t} \text{, left}\}}\}}\}]\).

1.2. Variation Among Languages

Auxiliary verbs do not have identical syntactic properties over or within languages. While English \textit{have} and Portuguese \textit{tem} can govern an empty VP, as discussed in Ambar (1987), French \textit{avoir}, Spanish \textit{haber}, and Italian \textit{avere} may not. French requires \textit{avoir} in certain structures in which Italian requires \textit{essere}. Causative \textit{make} is a structural case assigner in English but French \textit{faire} is not.

Other properties of auxiliaries are constant over languages. English \textit{have}, French \textit{avoir}, Italian \textit{avere}, and Dutch \textit{hebben} percolate the external theta-role of the head of their complement VP to matrix subject position, but \textit{be/être/essere/zijn} do not. Causative \textit{make/faire/fare} and modal \textit{can} and \textit{potere} are like \textit{BE} in this respect. Such systematic correspondences over languages suggest the existence of natural subclasses of auxiliary verbs. We distinguish two such subclasses, \textit{neutral auxiliaries} and \textit{T-auxiliaries}, on the basis of (32):

(32)  A \textit{T-auxiliary} assigns a T-role (Tense role) to its complement; a \textit{neutral auxiliary} does not.

All auxiliary verbs select a non-finite VP complement. A \textit{neutral auxiliary} combines with the T morpheme of its complement to form
a complex tense morpheme defining the tense of $S$.\footnote{French \textit{avoir} combines with the tense morpheme of its complement to form a complex tense morpheme denoting either a simple or a complex tense, as shown in (i). English \textit{have} combines with the tense morpheme of its complement to form a complex tense morpheme which obligatorily denotes a complex tense, as shown in (ii): \begin{itemize} \item[(i)] J'ai vu Pierre à quatre heures/souvent. \item[(ii)] I have seen Peter *at four o'clock/often. \end{itemize}} A \textit{T}-auxiliary governs a VP with an independent tense morpheme. We refer to the selection of a VP complement with independent tense as assignment of a T-role.

The same lexical item may function as a neutral auxiliary in one context and as a \textit{T}-auxiliary in another. In (33a) below, for example, \textit{have} functions as a neutral auxiliary, combining with the past tense morpheme of \textit{burned} to form a complex past tense. In (33b), \textit{have} functions as a \textit{T}-auxiliary: the tense morpheme incorporated in the embedded past participle denotes a time independent of that of the matrix verb:

\begin{enumerate}[leftmargin=*]
  \item[(33)] a. John has [\textit{VP burned his house}].
  \item b. John had [\textit{VP his house burned}].
\end{enumerate}

Interpretively, \textit{have} is a mere tense-carrier in (33a), but a causative (or benefactive) auxiliary, like \textit{make}, in (33b). And while \textit{have} does not assign structural case as a neutral auxiliary in (33a), it does assign structural case when construed as a causative verb in (33b). Generalizing this behavior, we will say that neutral auxiliaries do not assign structural case, while \textit{T}-auxiliaries may or may not.

We distinguish a \textit{T}-role, assigned by a \textit{T}-auxiliary, from a \textit{theta-role}, assigned by a lexical verb. A theta-role assigns referential content to a complement construed as an object or a proposition, while a \textit{T}-role assigns an independent tense value to its complement. We thus posit a tripartite division: lexical verbs assign theta-roles, \textit{T}-auxiliaries assign \textit{T}-roles, and neutral auxiliaries combine with the tense morpheme of their complement to define the tense of $S$.

The constraint in (34) links thematic saturation to independent tense:

\begin{enumerate}[leftmargin=*]
  \item[(34)] An XP which is assigned a \textit{T}-role is a Complete Thematic Constituent (CTC): all theta-roles associated with X, the head of XP, are assigned internal to XP.
\end{enumerate}

What underlies (34) is the interpretive function of tense as an
operator on a theta-domain. As a consequence of (34), the argument domain of X is identical to its tense domain.

Various syntactic processes illustrate the identity of tense and theta-domains. One such process is clitic climbing. In the output structure of clitic climbing, the arguments of a lexical verb are adjoined to the head of the T-chain which T-marks that verb. While the clitic defines the initial boundary of a tense domain, its trace marks the final boundary.

A second syntactic process which illustrates the identity of tense and theta-domains is theta-role percolation. When HAVE functions as a neutral auxiliary, as in (33a), it does assign a T-role to its VP complement and cannot govern a CTC. The external theta-role F of the VP complement percolates to the matrix subject. In (35) below, for example, the external theta-role F of laugh percolates to Infl, which assigns it to the matrix subject under subject-Infl agreement. The tense-argument domain of HAVE then includes the T morpheme in Infl, the subject (under Spec-head agreement), the auxiliary verb have, and the main verb laugh:

(35) John [t I [VP has [VP laughed]]].

\[ \theta_1 \]

BE is a T-auxiliary, which assigns a T-role to the VP it governs. Consequently, the tense of the embedded VP is independent of that of the matrix V. By (34), the complement of BE must be a CTC, whose external theta-role is assigned within VP itself. In the passive construction (36), for example, the internal (\( \theta_2 \)) theta-role is assigned to the ec in postverbal position and the external (\( \theta_1 \)) theta-role is assigned to the affix of the past participle (cf. Roberts 1985a and 1987). In the unaccusative structure (37), the sole theta-role of venir is assigned to its direct object. The argument domain of a syntactically unaccusative verb is thus invariably identical to its tense domain:

(36) John, was [VP ec seen ec, \( \theta_1 \theta_2 \)].

(37) Jean, est [VP ec venu ec, \( \theta \)]

\* If French avoir is, as we claim, a neutral auxiliary which percolates the external theta-role of its complement to the matrix Infl, then Ss like (i), parallel to the more usual unaccusative structure (ii), are problematic:
We claim that causative and perception verbs are T-auxiliaries, like BE, and assign a T-role to their complement VP. Consequently, they take a CTC complement whose external theta-role is assigned within its VP projection. The external theta-role may be assigned to a lexical NP in SC subject position, as in the Ss of (38), or to an infinitival affix, as in (39), or in other ways to be discussed in Section 7:

(38)  
   a. John made [\textit{VP} Mary sing].  \theta_1 
   b. Jean a laissé [\textit{VP} Marie chanter].  \theta_1 

(39)  
   Cela fait [\textit{VP} lire des livres]  
   \theta_1 \theta_2 

We propose in Section 8. that modal verbs function as lexical verbs in French, as auxiliary verbs in English, and as either lexical verbs or auxiliaries in Italian.

Auxiliary verbs are in general subject to the following constraints:

(40)  
   a. A T-chain may not contain two auxiliaries of the same class.  
   b. Neutral auxiliaries precede T-Auxiliaries.

(40a) is illustrated by (27) above. (40b) rules out the Ss of (41):

(41)  
   a. *John was have seen.  
   b. *Mary made John have played with the baby.

(i)    Il a chanté des enfants. (It sang children)  
(ii)   Il est venu des enfants. (It came children)

In lieu of the absence of structures like (i) in Italian and other languages, it is plausible to posit that HAVE requires theta-role percolation, precisely because its tense domain is the matrix IP rather than the embedded VP. There is reason to believe that the VP in (i), contrary to that in (ii), does not in fact have independent tense. We assume that participial adverbials such as (iii) have independent tense. If so, the absence of participials such as (iv), derived from (i), would be surprising if (i) and (ii) were generated in the same way:

(iii)   Une fois les enfants venus... (Once the children come)  
(iv)    *Une fois les enfants chantés... (Once the children sung)

We propose, therefore, that while the Theme theta-role is assigned to the object directly by V in (ii), in (i), the Agent theta-role is assigned to the direct object by Inf. This hypothesis accounts both for the choice of \textit{avoir} instead of \textit{être} in (i) and the absence of participial structures, which lack an Inf node in LF, of the form (iv).
Epistemic modals, which are auxiliaries in English and, we claim, may also be construed as auxiliaries in Italian, are problematic with respect to (40), however.

While HAVE, BE, and root modals may not recur in a simple T-chain, epistemic modals may, even when functioning as auxiliaries in an Italian clitic climbing structure such as (42):

(42) Maria, ci potrebbe esser dovuta tornare t₁ t₂.
     (M. there could be must returned)

And while neither BE, MAKE, nor root modals may precede a neutral auxiliary, an epistemic modal may, as in (43):

(43) a. John must have met Bill.
    b. Mario lo deve aver incontrato t₁

From this point of view, epistemic modals resemble epistemic verbs which can also govern a VP headed by a neutral auxiliary, as in (44):

(44) John was believed to have been seen.

It may therefore be tempting to classify epistemic modals as verbs rather than as auxiliaries. However there are important differences between epistemic modals such as MUST and epistemic verbs such as BELIEVE. (i) Modal verbs do not govern a tensed CP in the languages studied, but verbs like seem and croire do. (ii) An epistemic verb such as BELIEVE can intervene between two auxiliaries such as have and be, as in (44) above, but an epistemic modal cannot, as shown by the ungrammaticality of (214) below in Italian. (iii) A modal may govern a lexical VP directly, with no other tense marker intervening, as in (45a), but an epistemic verb may not, as shown by the ungrammaticality of (45b) without inflectional to:

(45) a. John must [speak English well].
    b. *John seems [speak English well]

(iii) Modal verbs but not epistemic verbs are generated in Infl in English. (iv) Modal verbs can raise to Infl and Comp in infinitival structures in EP, Italian, and French, but epistemic verbs may not.

We therefore classify epistemic modals as auxiliaries. We attribute the difference between epistemic auxiliaries and other aux-
iliaries to different scope properties in LF. While the scope of a root modal is limited to the VP which it governs, the scope of an epistemic modal, as has been often noted, is the entire tense domain which contains it. Huang (1982) argues that the syntactic position of a *wh*-word in S-structure in English corresponds to the LF position of a *wh*-word in Chinese. It may be the case that the syntactic position of a modal verb in English corresponds to the position to which modals move in LF in other languages. We will explore this suggestion in future work, where we will also examine aspectual auxiliaries such as *stare per* in Italian and their interaction with neutral and T-auxiliaries. Hopefully, the scopal properties of epistemic modals will account for their free recurrence in a T-chain in Italian and their ordering properties wrt other auxiliaries.

We assume that a negative operator governs VP and is itself in or governed by Infl. We will construe the absence of NEG in a non-finite complement as an indication of the absence of an Infl node in LF and thus as a sign that the complement is construed as VP on that level. The assumption that every VP belongs to T-domain will then require that the governing verb be analyzed as an auxiliary. For example, in English, where Infl can contain but a single auxiliary, the ungrammaticality of (46b) and (47b) indicate that *be* and *have* govern VP, not IP, in LF and thus that they are auxiliary verbs:

(46)  
   a. I have not been seeing Mary.
   b. *I have been not seeing Mary.

(47)  
   a. John will not have been visiting his parents.
   b. *John will have not been visiting his parents.

The inability of causative complements to contain a negative operator, as shown in (48), likewise supports the hypothesis that causative verbs govern VP and are construed as auxiliaries:

(48)  
   a. Jean ne laisse pas [aller les enfants à l’école].
       (Jean does not let the children go to school).
   b. *Jean laisse [ne pas aller les enfants à l’école].

Frésina (1980) observes that in Italian, clitic climbing cannot take place from the complement of a modal verb if the complement contains a negation. As Frésina points out, the contrast in (49) supports the hypothesis that Italian modals take VP complements in clitic climbing structures:

Frésina (1980) observes that in Italian, clitic climbing cannot take place from the complement of a modal verb if the complement contains a negation. As Frésina points out, the contrast in (49) supports the hypothesis that Italian modals take VP complements in clitic climbing structures:
(49)  a. Lo, potemmo denunciare e,
b. Potemmo non denunciarlo.
c. *Lo, potemmo non denunciare e,
   We can (not-) denounce him

Auxiliary verbs vary in their morphosyntactic properties. The
causative auxiliary is a verb in Romance and Germanic languages, as
shown by the possibility of inserting adverbial elements between the
causative verb and its complement. The causative can be a mor-
phological affix in Eskimo languages, Japanese and Arabic. Since
lexical verbs assign a theta-role to their complement, a verbal affix
embedded in a lexical verb must be an auxiliary. If both root and
affix were lexical, one would expect a conflict between the two parts
of the word with respect to theta-role assignment to the comple-
ment. The affixal status of causatives in Eskimo, Japanese, and
Arabic thus provides an argument in favor of the auxiliary status of
causatives in UG.

A tense-carrying inflectional preposition may likewise function
either as an independent auxiliary or as a bound morpheme. The
contrasts in (51) vs (52) below show, for example, that the Ss of (50)
cannot have the same structure:

(50)  a. John has to leave Mary.
b. John is to leave Mary.

(51)  a. *John has not to leave Mary.
b. ?*John has to not leave Mary.
c. John does not have to leave Mary.

(52)  a. John is not to leave Mary.
b. ?*John is to not leave Mary.
c. *John does not be to leave Mary.

We have identified the inflectional P to as a T-marker. As head
of PP, to defines an independent tense domain. The neutral auxiliary
have, on the other hand, percolates the external theta-role of its
complement to the matrix subject. Since the tense domain of S is
identical to its theta-domain, the properties of auxiliary have and of
inflectional to are incompatible. This problem is solved in (50a) by
adjunction of to to V, where it incorporates with have to form an
epistemic modal, as shown in (53a):

(53)  a. John, I [VP has+to, [PP e, [VP e, leave Mary]]]. S-structure
     91
     b. John, I [VP has+to, [VP e, [e, leave Mary]]]. LF
     VP

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Have + to form a single syntactic constituent, as shown by the ungrammaticality of (51a), in which not intervenes between its two parts. The T-auxiliary status of have + to is shown by its resistance to movement to Infl, to the left of NEG, in (51b). Such resistance is typical of T-auxiliary have in American English, as shown by the contrast between the negative forms of (36) in (54). As a T-auxiliary, have + to does not, like have, percolate a theta-role to the matrix Infl but rather governs a CTC: (53) is a raising structure:

(54)  
a. John has not burned his house.  
b. *John had not his house burned.

In (51b) there is no incompability between the T-auxiliary BE, which takes a CTC complement, and the construal of to as head of a tense domain. The syntactically disjoint constituent consisting of be and to functions as an epistemic T-auxiliary. While not cannot intervene between have and to in (51a), such intervention is possible in (52a), where have and to are interpreted as two distinct auxiliary elements. As an inflectional head, to can define a subject position through which the external argument of its complement raises on its way to (SPEC IP), as illustrated in (55):

(55)  
a. John, I is [vp t, to [vp t, leave Mary]].  
   Θ1
b. John, I is [vp t, to [vp t, leave Mary]].  
   Θ1

The affixal nature of to in (50a) is further revealed by the existence of the word hafta, which substitutes for have + to. The inexistence of the word ista is predicted by our analysis, under which to is not the affix of be in (50b), but a separate inflectional auxiliary.

Italian also forms a modal verb by adjoining da to avere as in (56), associated with the structures in (57). In Italian, the merged verb is construed as a root modal, plausibly because da, unlike to, does not define a tense domain:

(56)  
L’ho da scrivere ((I it have to write)

(57)  
a. pro l, ’ho + da, [pp e1 [vp scrivere e1]].  
b. pro l, ’ho + da, [vp e1 [vp scrivere e1]].  

For some speakers, clitic climbing is obligatory with avere da, as shown by the ungrammaticality of (58) for such speakers:

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The syntactic behavior of avere da would contrast with that of other modals such as volere, where clitic climbing is apparently optional for all speakers:

(59)  
   a. Voglio scrivere  
   (I want to write)  
   b. Loi voglio scrivere.

The contrast between (58) and (59a) would suggest that if a modal obligatorily takes a VP-complement, clitic climbing is obligatory. If so, it is not clitic climbing which is optional in the complement of verbs like volere: what is optional is whether the complement is construed as IP or VP in LF.

2. Alternatives

The hypothesis that causative, perception, and, often, modal verbs function as auxiliaries simplifies the grammar. It obviates the need for a number of powerful syntactic devices which have been proposed in the literature essentially in order to eliminate the CP node of the complement of such verbs. These devices include insertion of one V projection inside another, syntactic reanalysis of two verbs as one, restructuring, and parallel structures.

In an early article, reprinted in Rizzi (1982), L. Rizzi associates the clitic climbing structure (60) with the D-structure (61). A restructuring transformation adjoins the embedded V' in (61) to the matrix V', deriving the S-structure (62). The underlined residue is deleted. Consequently, clitic climbing, blocked by opacity in (61), is grammatical in (62):

(60)  
Loi voglio leggere ci.

(61)  
Voglio [CP PRO leggerlo].

(62)  
[VP V' lo, voglio [V' i leggere ci]] [CP PRO [VP ti]]

Restructuring and reanalysis would account for the fact that structures which appear bisentential with respect to the projection principle function like simple Ss wrt syntactic phenomena such as clitic climbing and NP raising.

The proposals have a number of disadvantages, however.

(i) The proposed mechanisms are not independently motivated. V' adjunction as hypothesized in (62) is not otherwise necessary in Italian, nor, perhaps, in any other language. Chomsky (1986) limits movement to minimal and maximal projections, for principled reasons. However neither VP movement nor V movement are possible in (61). VP movement disallows structures like (63), and V movement does not avoid an opacity violation in (61):¹⁰

(63) Gli, voglio [dare il libro e₁].
     (I) him want to give the book

(ii) The proposed mechanisms are incompatible with well-established constraints on grammatical representations. (62) is ruled out by the ECP if there is a residue after V' movement, because CP contains a free trace. If CP is deleted, (62) is ruled out by the projection principle, which would require volere to take a CP complement on all syntactic levels.

Parallel structures have been proposed by Huybrects in unpublished work and by Haegeman and van Riemsdijk (1986) to account for verb adjunction in German and Dutch, and by Williams (1979) and Zubizarreta (1985) to account for clitic climbing in French causative structures. Under such accounts, in a S like (64), faire simultaneously takes a CP complement as in (65a), and forms a complex verb with lire as in (65b). The parallel structure is shown in (66):

(64) Je le fais lire. (I it make read).

(65) a. Je le₁ fais [CP PRO lire e₁].
     b. Je [VP le₁ fais lire e₁].

¹⁰ Haegeman and van Riemsdijk (1986) argue for V' movement in West Flemish and Swiss German. However recent work by H. den Besten and G. Webelhuth motivates an alternative proposal which accounts for the West Flemish and Swiss German data within a theory of movement restricted to heads and maximal projections. We discuss this alternative in a longer version of this study.
Such mechanisms appear to us to add unwanted power to the grammar.

(i) The mechanisms require grammatical constraints to be arbitrary assigned to different syntactic levels. For example, binding theory must hold solely on (65b), in order to satisfy opacity, while the projection principle must hold solely on (65a). This distribution of constraints is not independently motivated. Moreover the hypothesis that the binding theory holds on the simplex structure (65b) is incompatible with the existence of Ss like (67), from Morin (1978). Grammaticality of coreference between il and lui requires (67) to be associated with a complex structure equivalent to (68).\footnote{In unpublished work (1985), A. Hulc formulates other criticism of the parallel structure theory on the basis of the Binding theory.}

(67) Il me le lui fait donner.
(ii) Under the parallel structure analysis, faire lire is a verb in (65b). Yet it has none of the morphological or syntactic properties of a word. Each verb is conjugated separately (69), only the first moves under verb-second (70), and the pair of verbs are separated by adverbials such as the negative adverbial pas in (71):

(69)  Il fait lire le livre.

(70)  a. Fait-il lire le livre?
    b. *Fait lire -t-il le livre?

(71)  a. Je ne ferai pas lire le livre.
    b. *Je ne ferai lire pas le livre.

(iii) Parallel structures introduce into the grammar the powerful mechanism of crossing branches, which permit a single constituent to have two “is a” relations. For example, faire is a verb in (65a) but only part of a verb in (65b).

(iv) If reanalysis or parallel structures are part of UG, they should be available in all languages and for all complex structures. Yet there is considerable variation among languages. Proponents of such devices need to explain why Italian has causative and modal reanalysis, French has causative reanalysis and English neither of these.

(v) Reanalysis and parallel structures are unnecessary. The rules proposed by previous authors in order to account for clitic climbing or NP raising in complex structures derive output configurations which are syntactically equivalent to base structures headed by auxiliary verbs. These structures independently allow clitic climbing and NP raising. Moreover, reanalysis and parallel structure rules do not apply to auxiliary structures, which contain no embedded CP to begin with. If, as we propose, “restructuring” causative and modal verbs are analyzed as auxiliary verbs, the syntactic behavior which characterizes auxiliary-headed structures automatically applies to structures headed by causative and modal verbs.

Sentence pruning, reanalysis and parallel structures have also been proposed to account for verb raising from embedded complements in German and Dutch. Recent work by Pollock (1987) suggests, however, that only auxiliary verbs raise from VP to Infl in infinitival structures. If the causative and modal verbs which trigger raising to Infl from embedded Ss in German and Dutch are analyzed as auxiliaries, then whatever accounts for the contrast between (72b)
and (73b) in French, adapted from Pollock (1987), can be expected to extend to verb raising in German and Dutch:12

(72) a. [IP Ne [VP pas avoir lu Sartre à son âge]], c'est étonnant.
    b. [IP N'avoir [VP pas t; lu Sartre à son âge]]...
       (not to have/to have not read S. at his age, it's surprising)

(73) a. [IP Ne [VP pas lire Sartre à son âge]]...
    b. *[IP Ne lire; [VP pas t; Sartre à son âge]]...
       (not to read/to read not S. at his age...)

In our framework, the reason auxiliary verbs can optionally raise to Inf in both finite and non-finite Ss is that auxiliary verbs, contrary to lexical verbs, can pass on a T-index to the VP they govern.

3. A-Chains

3.1 NP-Raising and Clitic Climbing

We propose that NP-raising and clitic climbing are possible only out of complements interpreted as verbal projections in LF.

We follow Chomsky (1986) in assuming that proper government is a chain property, i.e. that proper government should be identified with antecedent government. Antecedent government can be obtained through the formation of extended chains, which include positions indexed by movement, head-specifier agreement, and head-head agreement.

NP raising cannot take place out of CP. This result can be derived on the following assumptions: (i) no chain across CP can be created via movement through the SPEC of CP position: this would constitute a case of improper movement in which a trace is A'-bound in the domain of its antecedent; (ii) no chain across CP can be created through head-head agreement between V and C. This follows if we assume that Comp introduces a new T-index and V-V agreement is based on a shared T-index.

There is no NP raising from the specifier of NP. This is expected if such raising also constitutes improper movement.

12 For an analysis of verb adjunction compatible with the framework developed here, cf. forthcoming work by J. Guéron and T. Hoekstra, and by H. Bennis and T. Hoekstra.
In Section 1., we generalized over CP and NP in terms of the FDC, which interprets both NP and CP as arguments, i.e. as nominal projections. Our proposal implies that the converse holds as well: where NP-raising is possible, the XP out of which raising has taken place is a verbal projection.

Chomsky (1986: section 11) considers two alternatives for raising configurations. In a configuration such as (74), we may either assume that $V_2$ is coindexed with the head of $VP_1$, under head-head agreement, or else $VP_1$ may be taken as an outer segment of $VP_2$, i.e. in effect be an instance of an adjunction structure:

(74) \[ NP_1 I + be_j [vp_1 V_j [vp_2 V_k t_i]] \]

John was killed

where $i=j$ by Specifier-Head Agreement (SHAG)

We want to suggest that the required antecedent government relation is obtained by virtue of head-head agreement, more precisely by virtue of an indexing relation between the intervening heads. Under our proposal, the relevant heads in (74), $I$, $V_1$ and $V_2$, are already assumed to be coindexed as a function of the T-chain, i.e. indexing for the purpose of T-marking between Tense and the lexical verb. We will say that a structure like (74) contains one multisegmented VP as a function of this indexing relation.

Under this approach, simple passives and subject raising constructions are treated identically: there is only a single, albeit multisegmented VP, which contains an auxiliary verb in every segment except the most deeply embedded one. The VP does not constitute a barrier because of the extended chain created by SHAG between (Spec, IP) and $I$, sharing an index with the trace of the raised NP.

Languages may vary in the class of verbs that allow NP-raising. While the Italian modal verb volere allows raising, as shown in (75a), this is excluded in French (75b):

(75) a. Maria, è voluta tornare ti a casa.
    Maria is (has) wanted to return home.

b. *Marie, est;/a voulu(e) rentre ti.

We shall return to this construction in Section 8. The ungrammaticality of (75b) suggests that the complement of a French modal is obligatorily interpreted as a nominal projection by the FDC, unlike its Italian counterpart.

We analyze clitic climbing as parallel to NP raising except that the clitic lands in or is base-derived in matrix Infl rather than matrix subject position. In our framework, clitic climbing in the modal
structure (76c) is parallel to clitic climbing in the auxiliary structure (76a) or the causative structures (76b) in French:

(76) a. Je l' ai [VP e; vu e].
b. Je le ferai [VP lire e].
c. Lo, voglio [VP leggere e].

Kayne (1987b) proposes that (i) clitics are heads, not NP's, and (ii) modal structures in Italian take a CP complement in which the clitic raises to the matrix Infl via the embedded Infl and Comp nodes, as in (77):

(77) [IP CL1 [CP [C t; [IP l; t; [VP t]]]]]]

The derivation in (77) would be available only in pro-drop languages, including older or dialectical forms of French, for it necessitates a strong Infl capable of L-marking the embedded VP.

Claims (i) and (ii) are logically distinct. Clitics may be heads without necessarily raising through Infl and Comp. Essentially, clitics A' bind NP positions. There exist other A' binders which are bare heads, and which bind A positions, such as, e.g. ne (cf. Kayne 1987b), beaucoup (Obenauer, 1985), and tous (Kayne 1975). It is not clear that all or any of these binders raise through Infl and Comp.

The hypothesis that the complement of a modal is a CP in Italian does not extend to clitic climbing in structures headed by avoir or être, which do not take CP complements. It does not extend (nor does Kayne claim it to extend) to clitic climbing in factive structures in modern French, which is not a pro-drop language. It does not extend to NP raising, which is also possible out of modal complements in Italian, as in (75a) above, for NPs are not heads and may not raise via Infl and Comp. Finally, this hypothesis does not account for the fact that NP raising out of modal complements triggers “auxiliary change”.

Kayne provides several arguments in favor of the hypothesis that the complement of the modal in clitic climbing structures is a CP. (a) There exist Ss with a wh-word intervening between clitic and trace, as in (i), from Rizzi (1982). (b) There exist Ss with the P di, which usually introduces a CP, intervening between the clitic and its trace, as in (ii):

(i) Su questo punto, non ti saprei che dire.
On this point, I wouldn't know what to say.

(ii) Lo, finirò (di leggere e).
I it will finish to read.

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The hypothesis that the modal complement is a VP in Italian extends, on the contrary, to all other cases of NP and clitic raising. Moreover it treats auxiliary choice in modal structures in exactly the same way as in passive or unaccusative structures, as shown in Section 6.

3.2 Past participle agreement

Kayne (1985) proposes that past participles agree with the subject of the small clause they head, as in (78b). More recently, Kayne (1987b) proposes that past participles agree with AGR within an IP or AGR-phrase, AGR agreeing in turn with the SC subject, as in (79):

(78)  a. Paul les a repeintes. (les chaises-fem.)
      (Paul repainted them - the chairs)
   b. Paul les\, a \{vp e\, repeintes e\}_i.

(79)  Paul les\, a \{ip e\, AGR\_i repeintes e\}_i.

In our framework, (78b) and (79) are equivalent. In (79) IP is not case-marked. It is therefore construed as a VP in LF under the

It seems to us that there is a problem with the productivity of Ss like (i). The speakers we have consulted frankly reject the Ss noted in Rizzi (1982) as marginal, except for (i), and refuse Ss of the type of (i) with verbs other than dire, such as (iii)-(vii):

(iii) *Non ti saprei chi presentare/mandare.
(iv)  *Non ti saprei che dare.
(v)   *La domando dove incontrare.
(v)   *Non gli saprei quanti soldi lasciare.

Moreover, as pointed out to us by Ignazio Mauro Mirto, Ss like (vi) exist, but not Ss like (vii):

(vi)  [Saperlo dire] è importante.
      ((to know how it to say) is important)
(vii) *[Saperlo che dire] è importante
      ((to know to you what to say) is important)

The hypothesis that a clitic can climb over a filled Spec CP predicts that constructions like (i) should be as productive as ordinary wp-movement structures, and that (vii) should be grammatical, contrary to fact. While we have no analysis of (i), the non-productivity of the construction makes us doubt its usefulness as a model of clitic climbing structures in general.
FDC, as in (78b). In order to be construed as a VP, IP must be T-marked, which it of course is, by tense-bearing avoir which governs it.

The reason IP is not case-marked in (79) is not that avoir lexically lacks a case F – Ss like (33b) above belie this hypothesis – but because of the visibility principle. If IP were case-marked, it would have to receive a theta-role, which auxiliary verbs cannot provide.

We propose that in (79), the case avoir assigns to IP is absorbed by AGR in Infl. Case marking makes agr visible, and enables it to function as a pronominal, agreeing with the sc subject of IP. V raises to Infl and the non-case-marked IP is construed as VP in LF.

The non IP character of past participle SCs is shown by the absence of NEG:

(80)  a. Je n’ai pas vu Charles.
      b. *J’ai ne pas vu Charles.

Pollock (1987) proposes that the order VERB ADV NP is a sign of raising of V to AGR position in IP, as in (81b):

(81)  a. J’ai à peine vu les enfans.
      b. J’ai vu à peine les enfants.

This data is compatible with our hypothesis that a non case-marked IP is construed as a VP in LF. (81b) is associated with the structure (ii) is also unusual, albeit not unique, according to Burzio. If di is a complementizer, and if complementizers cannot be doubly filled, then clitics cannot raise through Comp. Kayne suggests that di is in Spec CP in (ii). However, di functions as a head in its P and Complementizer uses. We propose, rather, that di is neither a complementizer nor a specifier in (ii), but, like da in (56) above, or to in (30), a P, head of PP which reanalyses with V, here finire, to form a modal auxiliary. This solution is all the more plausible as finire belongs to the class of aspectual verbs, which do not assign a theta-role to a CP complement. The lack of auxiliary change in (viii), noted by Burzio, suggest further that finire di defines a neutral auxiliary which obligatorily percolates the theta-role of the embedded verb to the matrix subject position:

(ix)  Coll’inizio della scuola, \{ avremo finito \} di andare in spiaggia.
      \{ *saremo finiti \}

(With the beginning of school, we will have finished going to the beach)

If the complement XP in (ii) were a CP, then whatever rule accounted for auxiliary change in the embedded CP would have to be blocked just in case the matrix verb was finire and the embedded CP was introduced by di.
S-structure (82a) and the LF (82b), which contains a single verbal projection:

(82) a. \( J'[\text{VP ai [\text{VP vu_i [\text{VP à peine t_i les enfants]}]}.} \)

b. \( J'[\text{VP ai [\text{VP vu_i [\text{VP à peine t_i les enfants]}]}.} \)

The contrast between (83a) and (83c-d) below could be taken as an argument against the SC raising analysis of copular constructions: a SC subject blocks raising in (83c-d). Why does it not block raising in (83a) as well?

(83) a. Il lui est \( [\text{AP t_i fidèle e}_i] \)

(He to her is faithful)

b. Il le croit \( [\text{AP t_i fidèle à Marie}] \)

c. \( ^*\text{Il lui croit [\text{AP Jean fidèle e}_i]}. \)

(He to her believes Jean faithful)

d. \( ^*\text{Il le, lui, croit [\text{AP t_i fidèle e}_i]}. \)

Williams (1983) does in fact argue against a raising analysis of *John seems sick*. The grammaticality of (83a) can be construed as an argument in favor of a raising analysis, however, if we adopt the following two assumptions: (a) proper government is a chain property (i.e. head government does not count); (b) minimality exists.

We assume that T-marking is equivalent to L-marking. If so, AP is not a barrier in (83). Nor is VP a barrier. We have argued that the I-projection can be considered an outer segment of the VP, by being indexed with VP through T-chain formation. (Alternatively, VP is no barrier because of V to I raising).

The ungrammaticality of (83c) and (83d) follows from the lack of antecedent government of the object trace by virtue of the minimality condition. The trace in (83c) is minimally governed by *fidèle*, which is not coindexed with the antecedent of the trace but rather with the subject of the AP.

Minimality is irrelevant in (83b) because, as Chomsky (1986) points out, minimality does not extend to the maximal projection containing a trace.

Now consider the representation of (83a) under our current assumptions, where \( k \) is a T-index:

(84) \( \text{Il lui, lui, +I}^k [\text{VP}^k \text{ est}^k [\text{AP t_i fidèle e}_i]}. \)

By the FDC, AP T-marked by *être* functions as a verbal projection. This hypothesis is supported by the fact that the auxiliary can bear clitics corresponding to the argument positions of A, as in
(83a). We have proposed that clitic climbing is always from a verbal projection. In (84), however, contrary to (83c-d), minimality does not prevent antecedent government of the trace in embedded indirect object position, for the adjective which governs $t_j$ bears the same index as its antecedent. In (84) index $i = index k$ by SHAG and the embedded adjective is indexed $i$ by head-spec agreement internal to AP. Therefore the cc governed by *fidèle is antecedent governed in (84).

The contrast between (83c-d) and (84) crucially depends on the A-chain created by subject raising. The raising analysis of copula constructions is supported as a consequence.

The contrast in (83) is also found in (85):

(85) a. Je laisse [Jean parler avec Marie].
(I let Jean speak with Marie)
b. Je le laisse [VP $t_j$ parler avec Marie]
c. *Je le lui laisse [VP $t_j$ parler $t_j$].

VP is not a barrier for $t_j$ in (85c) since VP is T-marked by the auxiliary verb *laisser. However, the embedded verb parler bears the index of its SC subject, which is distinct from that of its object, as shown in (86). Therefore the trace of the indirect object is not antecedent governed:

(86) **Je le lui laisse [VP $t_j$ parler $t_j$]

There are advantages to construing participial SCs as IP in syntax, although they function as VP in LF. The IP hypothesis permits a unified analysis of assignment of the external theta-role, as stated in (87):

(87) The external theta-role is assigned to Infl by VP.

In (88) below, *avoir, triggers percolation to the matrix Infl of the external theta-role assigned to the embedded Infl. In (89) the external theta-role assigned to the embedded Infl stays in the embedded IP, for BE must govern a CTC:\footnote{Lois (1988) also proposes that the external theta-role of a passive participle is assigned to its Infl.}

(88) a. John has beaten Bill.
b. John I has [IP [$_1$ en [VP beat Bill]]].

\begin{center}
\begin{tikzpicture}
\node[below right] at (0,0) {$\theta_1$};
\node[below left] at (0,0) {$0_2$};
\end{tikzpicture}
\end{center}

\footnote{Lois (1988) also proposes that the external theta-role of a passive participle is assigned to its Infl.}
(89)  a. Bill was beaten.
b. Bill, was [IP [i, en [VP beat t1]].

01  02

The hypothesis that the external theta-role of a passivized verb is assigned to AGR in its SC Infl accounts for the visibility of the external argument of a passivized verb for interpretive processes such as control.

If we assume that clitics appear in Infl, then the contrast in (90) supports the hypothesis that a past participle is construed as a VP rather than an IP in LF:

(90)  a. Je l'ai [XP vu].
b. *J'ai [XP le vu]

When a clitic does adjoin to a past participle, it must be the case that the participle has itself raised not only from VP to AGR of the participial clause but also from AGR to a higher Infl and possibly Comp position (cf. Pollock 1987). Such would be the case in the Italian examples in (91), discussed in Burzio (1986) and Belletti (1987):

(91)  a. la notizia comunicatagli
      the new communicated to him

      b. Conosciutami, Gianni è cambiato.
         Me known, Gianni changed.

In French, lexical participles do not raise to a higher Infl. The impossibility of clitics in French absolute clauses shown in (92) thus supports the hypothesis that participial clauses are themselves construed as VPs:

(92)  Une fois la nouvelle (*me) communiqué (*me/ moi)

While direct object NPs and clitics raise to the matrix S via the SC subject position, indirect object clitics do not, as shown in (93), where agreement is with the direct object, not the indirect object:

(93)  a. Les roses lui ont été données.
b. Les roses, lui, ont k [été k [e1 données k e1]].

In (93), i = k. All the verbs are coindexed by head-head agreement under T-marking as well as with the matrix subject by SHAG.
The matrix verb absorbs the index j of the clitic it bears as well as the index i. Since all the verbs in the T-chain are coindexed, they must all bear the index j of the matrix verb. Consequently the trace in the embedded VP is antecedent governed by index j on the lexical past participle.

We conclude that past participle agreement occurs within a SC interpreted in LF as a VP and governed by an auxiliary verb. The agreement data in (94)-(96) thus supports the hypothesis that in Italian, essere, fare and volere function as auxiliary verbs:

(94)  a. Maria è stata invitata.
      b. Maria, [VP₁ è [VP₂ e₁ stata [VP₃ e₁ invitata e₁]]].
           (M. was/has been invited)

(95)  a. Maria fu fatta invitare.
      b. Maria, [VP₁ fu [VP₂ e₁ fatta [VP₃ invitare e₁]]].
           (M. was made to invite)

(96)  a. Maria è voluta tornare a casa.
      b. Maria, [VP₁ è [VP₂ e₁ voluta [VP₃ tornare e₁ a casa]]].
           (M. is/has wanted to return home)

3.2.1 Failure of Past Participle Agreement

In the general case, a past participle agrees with a raised clitic or NP in French. In (97b), however, from Kayne (1987b), agreement fails to occur:

(97)  a. Je sais combien de chaises Paul a repeint*(es).
      b. Je sais combien de chaises il a été repeint*(es).

We assume, following Kayne, that in (97a), the raised NP moves from object position of the embedded IP to the SC subject position and then to a position adjoined to IP before raising to Spec CP. We associate (97b) with the S-structure (98a), in which the participle does not define a subject position (a possibility envisaged by Kayne), and the LF (98b):

(98)  a. ... combien de tables, il I a [VP été [IP e₁ [IP AGR repeint e₁]]].
      b. ... combien de tables, il I a [VP été [VP e₁ [VP AGR repeint e₁]]]

(98b) contains an extendend chain in which the matrix Infl is coindexed with the matrix auxiliary, the lower auxiliary and the lexical past participle as well as the matrix subject. The cc in embed-
ded object position is antecedent governed independent of agreement in the lowest sc.

But why is such agreement impossible in (97b)? And if agreement is not necessary for antecedent government within an extended chain, why is it obligatory in (97a)?

We account for the contrast wrt agreement in (97) on the same basis as the contrast in grammaticality in (99) and (100), which we attribute to the Definiteness Effect (DE):

\[(99)\]
\[a. \text{Il a été repeint des chaises.} \]
\[b. \text{Il a été repeint les chaises.} \]

\[(100)\]
\[a. \text{Il en a été repeint } e_i. \]
\[b. \text{Il les; a été repeint(les) } e_i. \]

The contrast in (99) illustrates the DE: an impersonal S cannot have a definite object. (100) shows that a clitic with phi Fs is construed as definite.

Under past participle agreement, AGR of the embedded IP acquires phi-Fs and is therefore construed as a definite pronominal. This is a consequence of the passage of the object in SC subject position: the subject of an adjectival or participial predicate is always definite, as shown by the contrast in (101), where (101b) is ungrammatical unless construed as generic:

\[(101)\]
\[a. \text{La chaise est repeinte/rouge.} \]
\[b. \text{Une chaise est repeinte/rouge.} \]

Since the object of an impersonal S cannot be definite, it cannot pass through SC subject position, where it will be construed as the definite subject of a predication and trigger the appearance of a definite pronominal in AGR. But if there is no subject, then there will be no agreement in (97b).

It follows from the existence of Ss like (97b) and (100a) that passage through the SC subject position of IP is not obligatory for all raised objects. The trace of the object of a V governed by an auxiliary is already antecedent governed by the lexical verb under head-head agreement with the auxiliary within a T-chain. Passage through SC subject position is necessary only for definite objects. Spec-head agreement in IP produces a clitic-like pronominal capable of locally identifying the phi-Fs of the definite direct object.

Note that indirect objects need not (and cannot) raise to the matrix S via the SC subject position: the indirect object clitics are
always construed as definite, plausibly as a function of the P à incorporated in lui/leur.

Our analysis of (97) treats agreement in participle IP as analogous to clitic doubling. It recalls recent analyses of wb-structures containing clitics in languages such as classical Arabic or Rumanian. In such languages a clitic-pro chain can double an extracted wb-word provided the wb-trace is construed as definite (Dobrovie-Sorin 1988; M. Amine, conference, U. Paris 8, 1988). We propose that AGR in a past participle in French or Italian has the same function as the clitic in such structures: it identifies the phi Fs of the trace of an extracted constituent construed as definite.

Some Romance languages lack past participle agreement in contexts in which other Romance languages allow it.

French has past participle agreement in contexts where Spanish lacks it, as shown in (102). Italian has past participle agreement in contexts where French lacks it, as in (103) and (104):

(102) a. Je les ai prises. (I them took + agr)
b. Los he tomado. (I them took – agr)

(103) a. Lì ho fatti prendere. (I them made + agr take)
b. Je les ai fait prendre. (I them made – agr take)

(104) a. Maria è stata invitata (M. is been + agr invited)
b. Marie a été invitée. (M. has been – agr invited)

If past participle agreement implies the existence of Infl in the participial SC, then lack of such agreement suggests lack of Infl. If so, some participial SCs must be construed as VPs even in syntax. Such variation in syntactic status of the participle is expected in our framework, in which it is the VP status of the participle in LF, not in syntax, which is crucial.

We account for the contrast in (102) by the universal constraint on AGR in (105), inspired by Ambar (1988) and Lois (1988):

(105) Agr may function as a pronominal clitic if it is T-marked and case-marked.

A non-finite XP governed by an auxiliary is always T-marked. The presence of pronominal agreement must then depend on whether the governing auxiliary can assign case to AGR or not.

Following Lois (1988), we attribute the contrast in past participle agreement between French and Spanish to the hypothesis that haber is not a case assigner while avoir is.
We associate the Ss of (102) with structures (106) and (107):

(106)  
   a. Je l' ai [IP e, I agr, prises ε].
   b. Je l' ai [VP e, prises+agr, ε].

(107)  
   Los, I he [VP como ε].

In (106a), IP is case-marked and T-marked by *avoir*. Since IP gets no theta-role, AGR must absorb the case F, in essence the visibility, of IP. The clitic raises from object position through subject position of IP, triggering pronominal AGR and allowing V+AGR to antecedeent govern the definite ec in object position.

In (107) Infl is invisible, for it is not case-marked by *haber*. Consequently, raising via subject position serves no purpose. As *haber* T-marks *tomado*, Infl, *haber* and *tomar* all have the same index, and the ec is properly antecedent-governed anyway.

If we assume that only an auxiliary which can function as T-auxiliary can assign a case F, then the difference in case assignment properties between *haber* and *avoir* follows from (108):

(108)  
   HAVE is solely a neutral auxiliary in Spanish, but either a neutral auxiliary or a T-auxiliary in French.

In French, *avoir* functions as a neutral auxiliary in its temporal function and as a T-auxiliary in the structures of (109):

(109)  
   a. Elle a deux frères. (She has two brothers)
   b. Elle a [son fils malade].

As Lois points out, Spanish has such structures, but with *tener*, not *haber*:

(110)  
   a. *Ha dos hermanos.
   b. *Ha su hijo enfermo.

(111)  
   a. Tengo dos hermanos.
   b. Tengo mi casa quemada.
   (I have my house burned)

The hypothesis that AGR must be T-marked accounts for the occurrence of temporal adverbials in constructions which are not part of a finite T-chain. In (112a), the particiopial sc is T-marked by the perfect temporal adverbial *une fois*. Adverbial XPs are predicates, not arguments, so IP cannot be theta-marked. The case F normally assigned to topics in A' position is assigned to IP and
absorbed by AGR. Since this case is nominative, it can be transmitted to the SC subject by SHAG. In LF, caseless IP is construed as VP:

(112)  a. Une fois les enfants venus, nous partirons.
   b. [CP Une fois [IP les enfants, [T agr, venus t_i]]].
   c. [VP Une fois [VP les enfants, [V' agr, +venus t_i]]].
   (Once the children arrive, we'll leave)

The impossibility of an external argument as in (113a) or an imperfect adverbial as in (113b) are two sides of the same coin: VP lacks an Infl position, so there is no way to assign an external theta-role. Without an external theta-role, imperfect aspect is not possible, as discussed in section 6.2.:

(113)  a. *Une fois les enfants chantés...
   (Once the children sung...).
   b. *Pendant dix minutes les enfants venus...
   (for ten minutes the children come...)

The necessity to T-mark AGR in a past participle accounts as well for the contrast in (114). We associate (114b) with the structures in (115). Since IP lacks case and theta-role, the participle phrase of (115b) is construed as a predicate rather than as an argument in LF:

(114)  a. *an arrived man.
   b. a recently arrived man.

(115)  a. [NP a [IP recently [IP e, arrived e_i] man_i]] S-structure
   b. [NP a [VP recently [VP e, arrived e_i] man_i]] LF

As for the adverbial participles in (112), in the absence of Infl in LF, both external arguments and adverbs which imply duration are excluded in phrases like (114b):

(116)  a. *A recently sung man.
   b. *A slowly arrived man.

It was shown in (103) and (104) above that French and Italian differ with respect to past participle agreement in the sequence AUX-AUX-VERB.

This contrast may be accounted for if we assume that in French but not Italian, the first auxiliary of an auxiliary sequence loses its
case property. We associate the Ss of (103) and (104) with structures (117) and (118):

(117)  
  a. Li ho [IP e_i agr, fatti [VP prendere e_i]].
  b. Je les_ ai [VP fait [VP prendre e_i]].

(118)  
  a. Maria, è [IP e_i agr, stata [IP e_i invitata e_i]].
  b. Marie a [VP été [IP e_i invitée e_i]].

In (117a) and (118a) avere and essere assign case but no theta-role to the IP they govern. This case is absorbed by AGR, which may then function as a pronominal clitic. In (117b) and (118b), avoir does not assign case to its complement, which then has no visible AGR and functions as a VP even in syntax. This difference in agreement has no consequences. In (117b) the Ec in embedded object position is antecedent governed by the lexical verb within an extended chain: prendere is coindexed with faire and with avoir and therefore bears the index i of the clitic attached to avoir. As infinitives do not show agreement with definite objects anyway, there is no crucial difference in LF between the Ss of (117). In (118b), avoir, inviter and être are all coindexed via SHAG with the raised subject which is identical to the object; so once again the Ec in embedded object position is antecedent governed. As the definite Ec is identified in both Ss of (118) by agreement in the lower SC, lack of agreement in the intermediate VP creates no crucial difference between them.

The contrast in (119) vs (120) is accounted for on the same basis as that in (117) vs (118):

(119)  
  a. Ho fatto leggere i libri.
  b. I libri furono fatti leggere.
  c. I libri, furono [IP e_i agr, fatti [VP leggere e_i]].

(120)  
  a. J'ai fait lire les livres.
  b. *Les livres furent fait lire.
  c. Les livres, furent [VP fait [VP lire e_i]].

In (119b), passive fare assigns its external theta-role to agr within the participial SC. Since fare assigns a case F to agr, the latter is visible and may function as a pronominal clitic on the verb. In (120c), however, the external theta-role cannot be assigned to AGR, for without case it is invisible. The external theta-role is thus unassigned and (120c) violates the projection principle.
4. Properties of T-Chains

a) A T-chain defines a tense domain.

We propose, following Zagona (1982 and to appear), that the abstract T in Infl T-marks (Tense marks) the VP it governs, assigning it a T-index. The T-index percolates to the semantic head of VP and becomes part of the reference of VP. As auxiliary verbs have no referential value, they cannot function as semantic head of VP and consequently cannot integrate the T-index. An auxiliary verb passes the T-index on to the VP it governs. This process is repeated until the index is absorbed by a lexical verb. In this way T-chains are derived of the form shown in (121), where the superscript k represents a T-index:

\[(121) \quad T^k \rightarrow [\text{aux}^k]^k \rightarrow [\text{vp}^k \ W^k]\]

We assume that every CP has its own T-index, originating in Comp, as originally suggested by den Besten, but located in Infl in syntax.

In finite Ss the T-index is assigned by finite Tense in Infl, either to a lexical verb as in (122a), or to an auxiliary verb as in (122b):

\[(122) \quad \begin{align*}
\text{a. Jean} & \quad [t_i \ T^k \ \text{vient}^k \ \text{[vp}^k \ t_i \ \text{souvent}]]. \\
& \quad (J. \ \text{comes often})
\end{align*}

\begin{align*}
\text{b. Jean} & \quad [t_i \ T^k \ \text{a}^k \ \text{[vp}^k \ t_i \ \text{chanté}]]. \\
& \quad (J. \ \text{HAS SUNG})
\end{align*}

In non-finite Ss, the infinitival VP is T-marked by abstract Tense or an auxiliary verb in Infl, as in (123) or (124), if S is construed as a nominal projection:

\[(123) \quad [\text{IP} \ \text{PRO} \ [t \ \text{ne} \ T^k \ \text{pas}^k \ \text{être}^k \ \text{heureux}]], \text{c'est une chose fréquente.}
\]

\[(124) \quad [\text{IP} \ \text{PRO} \ [t \ \text{n'étre}^k \ \text{pas}^k \ \text{heureux}]], \ldots
\quad (\text{Not to be happy, it is a frequent thing})
\]

If the infinitive is construed as a verbal projection, it is T-marked by the T-morpheme of an auxiliary verb, as in causative and modal structures in many languages and Aux-to-Comp structures in

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\[15\] Lexical verbs do not raise to Infl in English (Emonds 1976). We will assume that the T-index is passed on to the finite verb in VP by T in Infl under percolation as proposed by Bennis and Hoekstra (1988).
Romance. In Dutch or English, inflectional P *te/to* can take the place of a tense morpheme, as in (30) above in English.

b) A T-chain creates an extended chain permitting NP raising and clitic climbing as discussed in Section 3. above.

c) A T-chain provides a path for the percolation of syntactic features. We assume the NP which determines the form of verbal inflection to bear nominative case. The distance between Tense in Infl and the NP bearing nominative case provides a measure of the length of a T-chain. For example, in English (125) and Dutch (126) below, a nominative case F percolates down the T-chain from Infl to V, which assigns nominative case to its object:

(125)  
\begin{itemize}
\item a. There is a problem.
\item b. There \( T^k \{ \text{be}^k \{ \text{a problem} \} \} \).
\end{itemize}

(126)  
\begin{itemize}
\item a. dat mijn broer jouw boek niet bevalt.
\item b. \( \text{dat} \{ \text{VP} \{ \text{mijn broer} \} \{ \text{jouw boek} \} \{ \text{niet bevalt}^k \} \} \text{T}^k \)
\end{itemize}

\begin{align*}
\text{DAT} & \text{--- NOM} \\
\text{---} & \text{---}
\end{align*}

In (127) and (128) below, nominative case percolates over the auxiliary verbs *may, have*, and *be*:

(127)  
\begin{itemize}
\item a. There *have* to *be* some changes around here.
\item b. There \( T^{[VP \text{have} \{VP \text{to be some changes around here} \}]} \).
\end{itemize}

(128)  
\begin{itemize}
\item a. There *may* *be* changes around here.
\item b. There \( T^{[VP \text{may} \{VP \text{be changes around here} \}]} \).
\end{itemize}

Clitics climb in the same domain in which nominative case percolates, as illustrated in (129). T, *essere*, and *arrivare* forma single T-chain, the last link of which both assigns Nominative case to and antecedent governs NP:

(129)  
\begin{itemize}
\item a. Ne sono arrivati molti
\item b. \( T^k \{ \text{nei} \} \{ \text{sono}^k \{ \text{NP} \{ \text{molti} \} \text{e} \} \} \text{NOM} \)
\end{itemize}

In (130)–(131), nominative case percolates over the lexical verbs *seem* and *believe*. In (131), for example, the nominative case F
assigned by T percolates from T to be, from be to believe, and from believe to be, which assigns nominative case to its object:

(130)  
   a. There seem to be problems.
   b. There \([T \ [VP \ seem \ [VP \ to \ be \ problems]]]\).

   NOM

(131)  
   a. There were believed to be problems.
   b. There \([T \ [VP \ were \ [VP \ believed \ [VP \ to \ be \ problems]]]]\).

   NOM

The ability of nominative case to percolate over seem and believe raises a problem if percolation is a property of T-chains and only auxiliary verbs function as links of a T-chain. In Section 1. above, we rejected the idea that epistemic verbs are auxiliaries. We will thus distinguish the simple T-chains in (127) and (129) from the complex T-chains in (130) and (131) on the basis of (132):

(132)  
Case percolation may extend from T-chain\(^k\) to T-chain\(^p\) just in case the last verb of T-chain\(^k\) is an epistemic verb like believe or seem. The sequence consisting of T-chain\(^k\) + T-chain\(^p\) is a complex T-chain.

In French, accusative case can percolate along a T-chain. The unaccusative verb in (134) below is not a lexical case assigner (cf. Burzio 1986). Nevertheless its lexical object must be case marked. Nominative case being assigned to the expletive in subject position, we assume the case on the object to be accusative. We propose that the generalization in (133) holds in French:

(133)  
Tense assigns Accusative case iff coindexed with Nominative agr.

In (134) Tense assigns an ALL case F to V which V assigns to its object. In (135) être serves an intermediate link in the T-chain along which ACC case percolates:

(134)  
   a. Il vient des linguistes.
   b. \(\text{Il} \ [T \ [\text{venir des linguistes}]]\).

   \ N O M   \ A C C

(135)  
   a. Il est venu des linguistes.
   b. \(\text{Il} \ [T \ [\text{est [vien des linguistes]}]]\).

   \ N O M   \ A C C

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Theta-role Fs as well as case Fs percolate along a T-chain. The external theta-role normally percolates upward from VP to Infl and is assigned to the subject under agr-subject agreement, as in (136):

(136)  a. John saw Mary.
     b. John\' [agr\' T [VP saw Mary]].

The neutral auxiliary HAVE serves as intermediate theta-role percolater in (137):

(137)  a. John has seen Mary.
     b. John\' [agr\' T [\text{VP has } \text{[VP2 seen Mary]}]].

In a transitive S, the goal theta-role percolates from V to dependent P in (138). In an unaccusative S the benefactive theta-role percolates from V to P via V', as in (139):

(138)  a. We speak to John.
     b. We [VP speak [\text{PP to } \text{[NP John]}]].

(139)  a. Il est arrivé quelque chose à Jean.
         (It happened something to John)
     b. Il [est \text{[VP arrive quelques chose] à Jean}].

5. The FDC and topicalized constituents

Certain constituents are not straightforwardly identified by the FDC. Topics, for example, being ungoverned, bear neither the structural case which would identify them as nominal projections nor the T-index which would identify them as verbal projections. And empty categories may be nominal without being case-marked. The notion of chain will allow us to account for all nominal categories.

We propose that binding relations identify $X'$ categories as nominal in syntax. If so, a Topic is nominal whenever it binds an ec or a pronominal in S and ecs are nominal when bound.
The VP Topicalization structures in the English and Dutch Ss of (140) would then, paradoxically, involve nominal projections:

(140) a. [een boek gelezen] dat heeft hij niet.
   [XP [een boek gelezen] [CP dat [C' heeft [IP hij niet e_i]]]].

   b. And read a book he has.
   [XP [read a book] [CP O_i [IP he has e_i]]].

In the Ss of (140), the XP in topic position is neither case marked nor T-marked. However, it is coindexed with a pronominal operator in Comp. The pronominal operator is itself nominal, for it is part of an A'-chain which includes an ec in A-position. Therefore XP is nominal.

The ec in (140) is operator-bound and construed as a variable. Like other variables, in both Dutch and English the ec obeys island constraints, as shown by the contrast between (140) and (141) (cf. Zagona 1982):

(141) a. *En een boek lezen, dat ontmoette ik een man die niet e_i wil.

   b. *And read a book, I met a man who will e_i.

Note that since all variables are bound, our claim that binding occurs between nominal projections implies that all variables are nominal.

The hypothesis that VP topics are nominal projections accounts for the contrast in (142) on the basis of the FDC:

(142) Bill said John was reading and

a. (reading)_i he may have been e_i.

b. *(been reading)_i he may have e_i.

c. *(have been reading)_i he may e_i.

If we assume that T-marking identifies a verbal projection in syntax as well as in LF, and if a topic is construed as a nominal projection under binding in syntax, then the topic may not be T-marked as well on this level. It follows that (142b) and (142c) are excluded on grounds of semantic incoherence. The topic binds an ec and is therefore construed as nominal; but it is also T-marked, and is therefore construed as verbal as well.

On the basis of binding relations and resistance to T-marking, we propose that the ec corresponding to the topic in the Ss of (140) is construed as a nominal projection in syntax. The topic must ultimately be interpreted as a VP, however. We propose that an ec which is nominal in syntax may be construed as verbal in LF if it is
T-marked on this level and if such construal violates no grammatical principles. In (140a’) below, corresponding to the reconstructed LF of (140b), the topic XP replaces $e_i$. T-marking by the governing auxiliary identifies XP as a VP in LF:

(140a’) He may have been [$_{XP}$ reading].

Not all empty categories are necessarily construed as nominal, however. An empty cateogory may be construed as a verbal projection if it is T-marked and neither case-marked nor bound. Williams (1977) points out that the empty VP in VP deletion structures need not be bound in $S'$ and is insensitive to island constraints:

(143) John just read that book and I met someone at the party who did $e$ also.

Moreover, unlike the topicalized VP of (142b) and (142c), a null VP may be governed by an auxiliary verb in $S$-structure:

(144) John may have been seeing Mary and
    a. Bill may have been $e$ too.
    b. Bill may have $e$ too.
    c. Bill may $e$ too.

We attribute the contrast between (142b-c) and (144b-c) to the fact that no binding rule of $S$ grammar applies in the latter case. Since nothing forces construal of the $ec$ in the $S$s of (144) as a nominal constituent, it may be construed as an empty VP, T-marked and identified by an auxiliary verb, on all levels of grammar.

Although cleft structures are syntactically equivalent to topicalization structures (Chomsky 1977), the cleft version of $S$s like (142a) is ungrammatical:

(145) a. John may have been reading a book.
    b. "It is reading a book that John may have been.
    c. $I_t$ is [$_{XP}$ reading a book], that, John may have been $e$.

(145c) is ruled out by contradictory construal on the level of LF. In a cleft $S$, the focus constituent is coindexed in syntax with the matrix subject $i_t$. In LF, (145c) has the structure (145c’) after reconstruction. Here, XP is identified both as an NP, by coindexation with the subject, and as a VP, by T-marking:

(145c’) $I_t$ is that; John may have been [$_{XP}$ reading a book].
In the topicalization structure (140a’), on the contrary, repeated below, XP is solely and coherently identified as a VP by T-marking:

(140a’) He may have been \[_{XP} \text{ reading}.\]

As expected, nominative gerunds such as (146) are acceptable in a cleft S, as shown by the contrast between (145c) and (145b) and (146). In (146’), the LF corresponding to (146), XP is coherently identified as a nominal projection both by coindexing with the matrix subject \(it\) and by case marking from the governing verb like:

(146)  
   a. It is reading books that he likes.
   b. It is \[_{XP \text{ PRO reading books}} \] that he likes \(e_i\).

(146’) It is that \(i\) he likes \[_{XP \text{ PRO reading books}} \].

6. HAVE and BE

We distinguish T-auxiliaries, which assign a T-role to their VP complement and govern a CTC, from neutral auxiliaries, which assign no T-role and trigger percolation of the external theta-role of their complement to the matrix Infl.

In Romance and Germanic languages, HAVE functions primarily as a neutral auxiliary and BE as a T-auxiliary. In French, HAVE also functions as a T-auxiliary. In the existential structure (147) and the existential-possessive structure (148) below, avoir governs a SC CTC (cf. Guérin 1986). The subject of the embedded SC is construed as LOCATIVE in (147) and as BENEFACTIVE in (148). The possessive structure (149) differs from the existential structure (148) in one crucial aspect: In (149), the BENEFACTIVE theta-role is percolated to the matrix subject position instead of being assigned in VP. Percolation of the external theta-role \(F\) to matrix subject position generates a transitive rather than an unaccusative D-structure:

(147)  
   a. Il y a un problème. (There is a problem)
   b. Il y a \[_{\text{LOC THEME}} \] un problème.

(148)  
   a. Jean a deux frères. (John has two brothers)
   b. Jean a \[_{\text{BEN THEME}} \] deux frères.

(149) Jean a le livre. (John has the book)
   \[_{\text{BEN THEME}} \]
The fact that (147) and (148) manifest a definiteness effect – the direct object is necessarily indefinite – but (149) does not supports the hypothesis that (149) is a transitive structure while (147) and (148) are not. Only unaccusative structures manifest a Definiteness Effect.

Assuming the unity of lexical items, we will attribute the property of percolating a theta-role which avoir manifests as a neutral auxiliary to the fact that avoir also manifests this property as a T-auxiliary.

Être, on the contrary, lacks the ability to percolate a theta-role to Infl, both as a temporal auxiliary in (150a) and as an existential T-auxiliary in (150b):

(150)  a. Il est venu des gens. (It came people).
       b. Il était une fois une petite fille...
           (It once was a little girl...)

6.1 Aspect

We distinguish perfect from imperfect aspect. VP has perfect aspect if it denotes an event or process which is completed and lacks internal temporal structure. VP has imperfect aspect if it denotes an event which is initiated but not completed and which has internal temporal structure. An adverbial introduced by for/pendant is semantically compatible with an imperfect VP, while one introduced by in/en is semantically compatible with a perfect VP.

In the general case, unaccusative structures have perfect aspect, intransitive structures have imperfect aspect, and transitive structures have either perfect or imperfect aspect, as illustrated in (151)-(153):

(151)  a. Jean lit pendant des heures.
       John reads for hours
       b. *Jean lit en deux heures.
       *John reads in two hours.

(152)  a. *Jean, arrivera e, pendant des heures.
       *John will arrive for hours.
       b. Jean arrivera en deux minutes.
       John will arrive in two minutes.

(153)  a. Jean lit des livres pendant des heures.
       John reads books for hours.
       b. Jean lit un livre en deux heures.
       John reads a book in two hours.
We propose that aspect is a function of the syntax of theta-role assignment. Imperfect aspect requires the assignment of a theta-role external to VP. Perfect aspect is required when no theta-role is assigned externally.

The syntactic principle which determines aspect is reflected in the link between aspect and choice of auxiliary verb. In French *avoir is selected whenever a theta-role is assigned externally, so *avoir governs a VP with imperfect aspect. *Etre is selected when all theta-roles are assigned in VP, so *être governs a VP with perfect aspect. A verb which selects either *avoir or *être has imperfect aspect in the first case and perfect aspect in the second, as shown in (154) and (155):

(154)  
a. Jean a monté pendant des heures.  
     (J. has climbed for hours)  
b. *Jean est monté pendant des heures.  
     (J. is climbed for hours)

(155)  
  a. Jean est monté en vingt minutes.  
     (J. is climbed in 20 minutes)  
b. *Jean a monté en vingt minutes.  
     (J. has climbed in 20 minutes)

That aspect is a function of the syntax of theta-role assignment and not of a lexical entry alone is shown by the fact that a verb which assigns no external theta-role lexically may nevertheless have imperfect aspect if it takes auxiliary *avoir:

(156)  
  a. Ton gâteau a caramélisé dans le four pendant deux heures.  
     (Your cake has/ was caramelized in the oven for two hours)  
b. *Ton gâteau s’est caramélisé dans le four (*pendant deux heures).

If an unaccusative VP occurs with an imperfect adverbial, the VP denotes iterative instances of a perfect action, not a single durative action, as shown by the interpretive contrast in (157):

(157)  
  a. Jean a chanté toute la journée. (J. sang all day)  
b. Jean est tombé toute la journée. (J. fell all day)

Passive Ss have either perfect or imperfect aspect:

(158)  
  a. Le record a été battu en dix minutes.  
     (The record was beaten in ten minutes)  
b. La pâte a été battue pendant dix minutes.  
     (The batter has been beaten for ten minutes).
We attribute this variation to a difference in the scope of the temporal adverbial. In (158a), *avoir* plus *être* form a simple past tense equivalent to the preterite form *fut*. The scope of the perfect adverbial is VP₂, as shown in (159a).

In (158b), where *avoir* and *être* function as independent auxiliaries, the scope of the imperfect adverbial is VP₃, as shown in (159b):

(159) a. Le record [VP₁ a [VP₂ été [VP₃ battu]] en dix minutes].
   b. La pâte [VP₁ a [VP₂ été [VP₃ battue]] pendant dix minutes].

French has structures in which the external argument appears in direct object position but takes auxiliary *avoir*, as in (160a). Our theory of auxiliary assignment requires that the theta-role be attributed to *des enfants* by the matrix Infï in such Ss. If so, they should take imperfect, not perfect, aspect. This prediction is correct:

(160) a. Il a chanté *des enfants*.
   b. Il a chanté *des enfants* pendant *des heures/ en deux heures.*
   (It sang children for hours/ in two hours)

### 6.2 French *être* vs Italian *essere*

*Étre* and *essere* are basically T-auxiliaries which assign a T-role to their CTC complement. We propose that *essere*, unlike *être*, can refrain from assigning its T-role. *Essere* then functions like the neutral auxiliary *avere* except that, as it does not have a possessive use like *avere*, it cannot trigger theta-role percolation.

The difference between *être* and *essere* shows up in a number of syntactic contexts.

Because *être* assigns a T-role to the VP it governs, it is always followed by a verb of action, while *essere* can govern a VP denoting a state or process, as shown by the contrasts in (161)-(164):

(161) a. Il burro, è [fuso e:]. (The butter has melted)
   b. Le beurre, a [fondu e:].

(162) a. È piovuto (It has rained)
   b. *Il a plu.*

(163) a. È sembrato que S. (It has seemed that S)
   b. *Il a semblé que S.*
(164) a. La musica è sempre [piaciuta e a Gianni].
(Music has always pleased Gianni)
b. La musique, a toujours [plu e, à Jean].

And while neutral essere can be followed by a T-auxiliary such as essere, fare, or volere, as shown in (165), French être cannot be followed by a T-auxiliary. Avoir is used in the French analogue of (165a) and (165b), and (165c) is ungrammatical in French whatever the auxiliary:

(165) a. Maria è stata invitata.
Marie a été invitée.
(M. is/has been invited)
b. Maria è potuta tornare a casa.
Marie a pu rentrer à la maison.
(M. is/has could return to home)
c. I libri furono fatti leggere.
*Les livres furent/ont été fait lire.

Italian stare is a T-auxiliary like essere. As an auxiliary, it triggers clitic climbing, as in (166a). As a T-auxiliary, it may be preceded by a neutral auxiliary, as in (166b):

(166) a. Sognava che la, stava baciando e,
(He dreamt that he was kissing her)
b. Essendo Mario stato torturato...
   [CP=VP essendo, [IP=VP Mario, t; [VP stato [VP t; torturato t]]]
   (being Mario been tortured).

While essere may precede stare, as in (166b), stare cannot precede essere, as shown in (167). The contrast between (166b) and (167) supports the hypothesis that essere, but not stare, can function as a neutral auxiliary:

(167) *Mario stava essendo bastonato.
(M. was being beaten)

The constraints on the distribution of auxiliaries in (40) above and the hypothesis that fare is a T-auxiliary while essere may function as a neutral auxiliary likewise account for the fact that while essere may govern fare as in (165c), fare may not govern essere as shown in (168):

(168) *Farà [essere Maria vista dal dottore].
(He will make be Maria seen by the doctor).

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Italian modal structures manifest "auxiliary change": a modal verb selects avere in isolation or in structures without clitic climbing like (169a), but it selects essere in a structure with clitic climbing whenever the most embedded verb normally take essere, as in (169b):

(169) a. Maria ha voluto venirci. (M. has wanted to come here)
    b. Maria ci è voluta venire. (M. here is wanted to come)

The restructuring framework discussed in Section 2. includes a rule which follows restructuring and changes avere to essere in the pertinent stipulated context. Our analysis needs no rule of auxiliary change. In (169a), volere is construed as a lexical verb. It percolates its external theta-role to the matrix subject, as shown in (170a). Consequently, it requires auxiliary avere, which triggers theta-role percolation. In (169b), volere functions as a T-auxiliary associated with the raising structure (170b). In a raising structure, the matrix subject position and all embedded SC subject positions intervening between the raised NP and its extraction site are non-theta positions. Consequently, both VP2 and VP3 of (170b) must be CTCs, and the neutral auxiliary is necessarily essere, which blocks theta-role percolation:

(170) a. Maria, [VP1 ha [VP2 voluto [CP PRO i venirci ei]]].

    \[\text{\underline{\text{\theta}}1 \text{\underline{\text{\theta}}2}}\]

    b. Maria, [VP1 ci è [VP2 ei voluta [VP3 venire ei]] ei] \\
       \[\text{\underline{\text{\theta}}2 \text{\underline{\text{\theta}}3}}\]

The same rules which determine auxiliary choice in the bi-segmental VP of (171) below determine auxiliary choice in the trisegmental VP of (170b) with no further stipulation:

(171) a. Gianni ha parlato.
    b. Gianni [VP1 ha [VP2 parlato]].

    \[\text{\underline{\text{\theta}}1}\]

c. Gianni è venuto.
    d. Gianni [VP1 è [VP2 e, venuto ei]].

French marginally allows climbing of oblique clitics. This raising process does not trigger "auxiliary change", however, as pointed out in Kayne (1987a):
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(172)  a. ?Jean y a voulu aller.
       b. *Jean y est voulu aller.

The hypothesis that essere can function as a neutral auxiliary but être cannot accounts for the ungrammaticality of (172b). In (169b) above, neutral essere precedes the modal auxiliary volere. In French, avoir is the only auxiliary which may precede another auxiliary. So avoir must be selected even when vouloir is construed as an auxiliary rather than as a lexical verb. The contrast between (169b) and (172b) is thus accounted for on the same basis as that between the Italian and French Ss of (165a).

7. Causative Verbs

We analyze causative verbs as T-auxiliaries, like BE, in French, Italian, English, Dutch, and the Scandinavian languages. In this paper, we will concentrate on French and Italian.

In Section 2., we proposed that all verbs which intervene between a raised object and its extraction site are auxiliary verbs. Thus faire and faire are T-auxiliaries in (173):

(173)  a. Je l'ai fait voir.
       Je [vp1 l'ai [vp2 fait [vp3 voir e]]].
       (I it have made see)
       b. I libri furono fatti leggere.
       I libri [vp1 furono [vp2 e fatti [vp3 e leggere e]]]
       (The books were made read)

The hypothesis that faire is an auxiliary verb is independently supported by its function in VP anaphora, as shown in (174b) below:

(174)  a. John will [vp buy bread] and Bill will e, too.
       b. Jean a [vp acheté du pain] ce matin et Pierre le, fera e, ce soir.

In the English VP deletion structure (174a), an auxiliary verb bears the tense value for the ec which replaces a lexical VP. In the equivalent French structures, analyzed in Zribi-Hertz (1986), the pronominal chain (le, e) stands for the lexical VP, while faire functions as the tense carrier. Since only an auxiliary verb can provide the tense for the lexical category it governs, we must analyze faire as an auxiliary, equivalent to English have, will, etc., in (174b).

In English and Dutch, there exist infinitival CP/IPs headed by
the independent P to/te. All bare infinitives are VPs. The causative complement in the Ss of (175) must then be a VP and the causative verb an auxiliary:

(175)  
a. They let [VP John leave].
b. Ze lieten [VP Hans vertrekken].

If a causative verb assigns structural case, like English make or let, Norwegian la or French laisser, it can case mark the subject of its VP complement, as in the Ss of (176):

(176)  
a. We made/let [the warden hang the prisoners].
b. Nous avons laissé [le gardien pendre les prisoniers].
c. Vi lar [vokteren henge fangene].

If the causative verb is not a structural case assigner, like French faire, the grammar contains alternative strategies to ensure that the complement of the causative is a CTC, assigning its external theta role within its VP projection, as required by (34).

In the first causative structure, (177), the complement verb appears not to assign its external theta-role at all:

(177)  
Je ferai [lire ces livres]. (I will make read these books)

If we assume that infinitival SCs are IPs in syntax, however, like participial SCs, the the infinitival VP may assign its external theta-role to the embedded Infl, as in (178a). As an auxiliary verb, faire assigns no theta-role to its complement, so IP must not be case-marked. The case F faire assigns to IP is absorbed by abstract AGR in Infl. With both case and theta-role, abstract AGR functions as a pronominal inflection in IP. The infinitive may raise to Infl, as in (178b), and the non-case-marked IP is construed as VP in LF, as shown in (179):

(178)  
a. Je ferai [IP I [VP lire ces livres]].
       \[1\] \[2\]
b. Je ferai [IP lire, [VP t, ces livres]].
       \[1\] \[2\]

(179)  
Je [VP1 ferai [VP2 lire, [VP3 t, ces livres]]].
       \[1\] \[2\]

The absence of NEG in the causative complement supports the hypothesis that the SC lacks Infl in LF:

(180)  
*Je ferai ne pas lire ces livres.
The multisegmented verbal projection in (179) provides two conjunction sites for VP adverbials, VP₂ and VP₃, as illustrated in (181):

(181)  
  a. Je ferai [VP₂ souvent lire₁ [VP₃ t₁ des livres]].  
  b. Je ferai [VP₂ lire₁ [VP₃ souvent t₁ des livres]].

A transitive complement to a causative verb may have perfect or imperfect aspect. The grammaticality of (182b), with imperfect aspect, supports the hypothesis of a semantically visible external argument in the embedded SC:

(182)  
  a. J'ai fait [lire des livres pendant des heures].  
  b. J'ai fait [écrire cette lettre en une heure].

Unlike participial SCs, infinitival SCs show no agreement with a SC subject. This difference may be a function of the morphology of infinitivals. While past participles absorb and form a single word with AGR in IP, we will assume that infinitives incorporate a syntactically inert AGR in morphology. On the assumption that a verb cannot arbor two AGR-morphemes, the infinitive cannot provide lexical support for abstract AGR in IP after raising to the SC Infl node. Consequently, it cannot raise to Infl at all, unless the IP is construed as a VP in LF and the free Infl in IP is deleted.

The embedded infinitival object raises directly to the higher Infl, without going into the SC subject position. If it did raise to Spec IP, free abstract AGR in Infl, unabsorbed by the verb, would trigger SHAG and force a nominal interpretation of the IP.

The ec in embedded object position is antecedent governed by _lire_, which carries the indexes of the matrix verb, including the index j of the matrix clitic, under T-marking:

(183)  
  Je Tₐ les, ferai [VP lireₖ ec₁]  
  (I them will make read)

The external argument of the causative complement, like that of a passive participle, may be doubled by an adjunct NP within the sc (cf. Roberts 1983a; Zubizarreta 1985):

(184)  
  a. Nous ferons [VP lire ce livre par les enfants].  
  b. Le livre a été [VP lu par les enfants].
The possibility of doubling the external argument supports the hypothesis that the causative complement is construed as a VP in LF. Were it an IP, the external argument in Infl, the head of IP would c-command the adjunct NP and the S would violate Principle C of the binding theory. The grammaticality of (184) contrasts with the ungrammaticality of (185) in Italian where the external argument si in Infl does c-command the coindexed NP in the by-phrase:

(185)  a. Si mangia le mele.
       b. *Si mangia le mele dai bambini.

(one eats the apples (by the children)

A second causative structure exists in French which we propose involves Aux-to-Comp movement within a SC. In (186), the external theta-role of the lexical complement is assigned to the subject of IP via Infl. Faire not being a structural case assigner, the verb raises to SC Comp position in order to assign case to its own subject under government. As an auxiliary, faire T-marks IP, identifying IP and CP as verbal projections in LF. Movement to Comp derives the multi-segmented VP shown in (186c):

(186)  a. Nous faisons [VP pleurer]. D-structure
       b. Nous [VP faisons [CP pleurer, [IP Jean ti]]]. S-structure
       c. Nous [VP faisons [VP pleurer, [VP Jean ti]]]. LF

Aux-to-Comp movement in (186b) complements the Aux-to-Comp movement discussed in Section 1. In SC like (9a) in EP, an auxiliary raises to Comp to T-mark a CP embedded under an epistemic verb. In (186b) a lexical verb raises, for the matrix verb is itself an auxiliary and a T-marker. While (9a) derives complex T-chains with two different T-indexes, causative structures contain a single T-chain and a single T-index.

(188) illustrates (187), the third causative structure we will consider. Here the external theta-role is assigned to Infl, which assigns it in turn to the dative NP in the embedded IP. The dative NP doubles as benefactive argument of VP₁ and as the external argument, and structural subject, of VP₂. Note that construal of faire as a T-auxiliary forces assignment of the external theta-role of lire within IP₂, since a T-auxiliary must govern a CTC:

(187) Je le fais lire aux enfants.
Since $V_2$ T-marks IP$_2$, there is no barrier between the clitic $le_{i}$ and its trace. IP$_2$ receives no case from $faire$ and is construed as VP in LF. V$_2$ is then part of the same T-chain as the matrix causative. Since V$_2$ bears the same index as the matrix verb which carries the clitic, $e_{i}$ is antecedent-governed.

Crucially, if we assume that SHAG takes place between I and Spec IP to its left, the postposed subject of IP$_2$ does not agree with I'. Consequently, there is no minimality violation in (188), contrary to e.g., (85c) above.

The hypothesis that the dative argument of IP$_2$ is construed as its structural subject accounts for the contrast in (189). As pointed out in Kayne (1975), the dative NP of a causative complement can bind an anaphoric object, like a structural subject and unlike a paraphrase:

(189) a. Pierre lève la main. (P. raises the hand)
b. Je fais lever la main à Pierre.
c. *Je fais lever la main par Pierre.

16 Our analysis of the dative NP in (188) as the structural and thematic subject of the embedded verb captures the spirit of the analysis in Kayne (1975) without invoking otherwise unmotivated rules to insert à or extract V' from CP.
This hypothesis also allows us to solve the paradox in (67), repeated below. The grammaticality of (67) suggests that the clitic trace is construed as *pro, a pronominal. In order for clitics to climb in (67), there must be no structural subject intervening between clitic and trace, or there will be a minimality violation. In order for the embedded indirect object and the matrix subject to corefer, however, there must be a subject in the embedded SC: otherwise the matrix S and not the embedded phrase will qualify as the MGC for the pronominal trace, and there will be a violation of Principle B of the binding theory:

(67) Il, me le lui, fait donner.

The paradox is resolved if the structure associated with (67) is as shown in (188). No Specifier-Head agreement in the lower clause prevents coindexing of the lower and higher V, while the presence of a dative subject assures that the embedded IP counts as the MGC of the pronominal trace:

(190) Il, me le lui, fait [IP donner e, e, e, e].

8. Modal Verbs

Modal verbs have many of the same syntactic properties as the auxiliaries HAVE and BE over languages. In English, modal verbs occupy the tensed Infl position and undergo movement to Comp, like *have and *be. In EP, Italian, and French, modal verbs raise to Comp in infinitival Ss, like other auxiliaries and unlike lexical verbs. In the framework of Chomsky (1986), raising to Comp presupposes raising to Infl. Pollock (1987) shows, in fact, that in French, modal verbs raise to Infl, like auxiliaries and unlike lexical verbs, as shown in (191):

(191) a. Il pensait [IP PRO ne [VP pas être heureux]].
   b. Il pensait [IP PRO n'être, pas [VP t, heureux]].
   (He thought not to be/to be not happy.
   c. Il pensait [IP PRO ne [VP pas pouvoir dormir ici]].
   d. ?Il pensait [IP PRO ne pouvoir [VP pas t, dormir ici]].
   (He thought not to be able/to be able not to sleep here)
   e. Il pensait [IP PRO ne [VP pas croire aux histoires de fantômes]].
   f. *Il pensait [IP PRO ne croire [VP pas t, aux histoires de fantômes]].
   (He thought not to believe/to believe not in ghost stories)

In Section 1., we attributed the ungrammaticality of Ss like
(191f) to the hypothesis that in the absence of finite tense, VP must be T-marked by an auxiliary verb. The contrast between (191d) and (191f) implies that a modal can function as a T-marker, and therefore as an auxiliary verb, in French.

In French only modal verbs can introduce an (optionally null) anaphoric VP, as shown in Zribi-Hertz (1986):

(192) Pierre voudrait [XP accorder le piano]
a. mais il ne peut/sait/doit pas [VP le faire].
   mais il ne peut/sait/doit pas.
b. mais Marie ne veut pas [VP le faire].
   mais Marie ne veut pas.
c. *mais il ne croit/décide pas [VP le faire].
   *mais il ne croit/décide pas.

Since a (possibly reconstructed) VP must be identified by T-marking in LF, the contrasts in (192) suggest, like raising to Infl, that modal verbs are T-markers and therefore may be construed as auxiliaries in French.

In Italian, modal verbs allow clitic climbing from their complement. If we assume that clitics adjoin to the first available Infl node, it follows that the complement of a modal is construed as a VP in LF under clitic climbing, and as an NP if the clitic remains in the lower clause.

We assume that a root modal obligatorily assigns an external theta-role and an accusative case F and optionally assigns an internal theta-role. If the modal assigns case to its complement XP, and XP retains the case, then XP is construed as IP and is assigned the internal theta-role of the modal, as in (193). We propose that the accusative case F may alternatively be absorbed by AGR in Infl, in which case XP is construed as VP and the modal as an auxiliary which T-marks rather than theta-marks its complement, as in the structures of (194). We will also assume that in either case root modals must control an ec in argument position of the embedded SC. In (193b), the matrix subject controls the PRO subject of IP while in (194), the matrix subject controls, we propose, pronominal AGR in Infl. V raises to AGR and the caseless IP is construed as VP in LF:

(193) a. Mario vuole leggere il libro. (Mario wants to read the book)
   b. Mario, vuole [IP PRO, [R [VP leggere il libro]]].

(194) a. Mario vuole [IP leggere, [VP ti, il libro]]. S-structure
   [01
   b. Mario vuole [VP leggere, [VP ti, il libro]]. LF
   [01
Clitic climbing is blocked by the ECP in (193), where the upper and lower subjects are part of two distinct chains, as illustrated in (195). Although the matrix subject controls the PRO subject of IP, control occurs between two distinct arguments, subject of different T-chains:

(195)  a.  *Mario lo, vuole [PRO leggere ε₁]

b.  Mario lo, vuolek [ip PRO[τ  PRO[τ  [vp leggereε]ε]ε]].

Clitic climbing is licit in a S like (196) because no subject intervenes between the matrix Aux, which bears the index of the clitic, and the embedded verb, so the latter antecedent governs the trace:

(196)  a.  Mario lo vuole leggere.

b.  Mario lo, vuolek [vp leggerek ε₁].

Frésina (1980) already proposed that the complement of volere is a base-derived VP in clitic climbing structures. Rizzi (1982) argues against this hypothesis on the basis of the interpretive contrast in (197):

(197)  a.  Mario gli, vuole [xp presentare Piero ε₁].
(Mario to him wants to introduce Piero)

b.  Piero gli, vuole [xp essere presentato τ₁ da Mario].
(Piero to him wants to be introduced by Mario)

While Mario is both the wisher and the introducer in (197a), in (197b) Piero is the wisher and Mario the introducer. Rizzi points out that if volere triggers a restructuring transformation, the difference in interpretation can be represented by associating the Ss of (197) with the D-structures in (198):

(198)  a.  Mario vuole [PRO presentare Piero a lei].

b.  Piero vuole [Mario presentare PRO a lei].

But if volere is a base-derived auxiliary, one might expect (197b) to have the same meaning as (197a). In other words, how can the control properties of volere be satisfied if XP = VP in (197)?

The English Ss in (199) raise the same interpretive problem as the Italian Ss of (197). In (199a) John both has a moral obligation and examines, while in (199b), John has a moral obligation but the doctor examines:

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(199) a. John must [examine his patients often].
    b. John must [be examined often by the doctor].

Yet English modals are base generated in Infl and govern VP, not CP. Unlike lexical verbs, modals precede VP-initial $not$ and cannot take auxiliary $do$:

(200) a. John must/$_w$ wants not (to) see Mary.
    b. John does not $^\ast$ must/$_w$ want (to) see Mary.

A solution to the interpretive problem of (197) based on the bisentential structures of (198) does not extend to (199), where the same interpretive problem arises and there is no underlying bisentential D-structure to refer to. In a framework in which modals can take VP complements, however, we can hope to find a unitary solution to the problem posed by (197) and (199).

We associate the Italian examples of (197) with structures (201) and (202):

(201) Mario$_i$ gli$_j$ vuole [IP$_i$ I [VP$_i$ presentare Piero$_e$$_j$]].
    $\theta_1$ $\theta_2$ $\theta_3$ $\theta_2$ $\theta_3$

(202) Piero$_i$ gli$_j$ vuole [IP$_i$ agr$_i$ essere [IP$_i$ t$_1$ agr$_i$ presentato t$_1$ t$_1$]].
    $\theta_1$ $\theta_2$ $\theta_3$

In (201), both the case F of $volere$ and the external theta-role of the complement verb $presentare$ are assigned to the embedded AGR. Agr then functions syntactically as a pronominal controlled by the matrix subject.

In (202) $volere$ assigns case to AGR in its complement IP. AGR then functions as the head of the chain containing the trace of the embedded object, and as the pronominal argument controlled by the matrix subject.

The problem of control may be thus accounted for under an analysis in which modals are auxiliaries, provided that the constituent which is construed as VP in LF contains an inflection node in syntax, and that AGR in Infl may function as a syntactic argument.

Modal verbs are also T-markers and may be analysed as auxiliaries in French, as we have seen. Why then are Ss like (196) not available in Modern French? Kayne (1987a) points out that apparently, only pro-drop languages allow clitic climbing in modal complement structures.

In our framework, the IP complement of a modal can be con-
strued as a VP if AGR in InfI absorbs the case F assigned to IP. In modal structures, case-marked AGR in InfI is syntactically active. Since it is controlled by the matrix subject, it must be in an argument position. The ability of InfI to contain a pronominal argument is the pro-drop parameter, however. Modern Italian, like older or certain dialectical forms of French, can have a pronominal argument in InfI and a null Spec IP position in finite clauses. If we assume that modern French no longer allows a pronominal argument in InfI in syntax in either finite or non-finite IP, we can account in the same way for the lack of null subjects in finite clauses and the lack of VP construal of modal complements. In both types of clauses, where Italian has an inflectional argument, French needs a Spec IP argument position. But the Spec IP position blocks clitic climbing by minimality, as we have seen in Ss like (83c-d) and (85c) above.

There is no contrast between French and Italian in causative structures: the complement IP is construed as VP and allows clitic climbing in both languages. We attribute the lack of contrast to the fact that in causative structures, the embedded pronominal in AGR, while semantically visible, is never subject to a syntactic rule such as control and so never defines InfI as an A-position.

Our analysis seems to be problematic for English. English is not a pro-drop language, yet modals take VP complements. It is well-known, however, that modern English modals correspond to Middle English lexical verbs (cf. Lightfoot 1979, Roberts 1985b). We propose that the strong verbal affix included in the modal functions as the external argument of the VP it governs. The sentences of (199) would be associated with structures (203) and (204):

(203)  John, [i must [v examine his patients]].
      01         01i   02

(204)  John, [i must [v t, be [i p t, agri examined t,]]].
      01   agri  01i   02

In (203) must assigns its external theta-role to the matrix subject; its verbal affix has inherent case, and is assigned the external theta-role of the embedded VP. This theta-role functions as a visible pronominal controlled by the matrix subject. In (204) agr in the matrix InfI is a case-marked pronominal binding the chain corresponding to the embedded object.

We propose that an epistemic modal likewise takes an IP complement in French, a VP complement in English, and either IP or VP in Italian, possibly as a function of the lexical identity of root and epistemic modals. Consequently, clitic climbing is permitted
from the complement of a modal in Italian, where the output structure contains a single T-chain. In (205), AGR in IP absorbs the case F of _dovere_ and functions as an expletive pronoun. The complement is construed as VP in LF, and no subject position prevents antecedent government of the ec by _vedere_, which is coindexed with the matrix auxiliary bearing the clitic antecedent:

(205)  
  a. Gianni lo deve vedere.  
  b. Gianni, lo deve [IP agr vedere c_i].

In French, the modal assigns case to IP. IP defines a nominal projection with an internal subject, which blocks raising by minimality. While (205) contains a single T-chain, (206) contains two T-chains:

(206)  
  a. _Jean_ la devrait voir.  
  b. _Jean, la_ devrait [IP PRO; t^p voir t_j].

The principles which determine the choice of neutral _avere_ or _essere_ in modal structures are the same as in non-modal structures. In (207) below, the external theta-role of _leggere_ percolates to the matrix subject. The temporal auxiliary must then be _avere_, which permits theta-role percolation. In the raising structure (208), the matrix subject must be a θ'-position. Consequently, the external theta-role of the embedded verb must be assigned within its IP. The temporal auxiliary must then be _essere_, which takes a CTC complement:

(207)  
  a. Mario lo ha voluto leggere.  
      (Mario it wanted to read)  
  b. Mario, I [VP lo ha [VP voluto [IP agr; leggere t_j]]].  
      θ_i  
  c. Mario, I [VP lo ha [VP voluto [VP agr; leggere t_j]]].

(208)  
  a. Maria è voluta tornare a casa.  
      (Maria is/has wished to return home)  
  b. Maria, è [IP e_i; voluta [IP agr tornare e_i a casa]].  
      θ_i  
  c. Maria, è [VP e_i; voluta [VP agr+tornare e_i a casa]].

Control in modal structures accounts for the contrast between (209) and (210):

(209)  
  Mario gli fa presentare Piero da Gianni.

(210)  
  *Mario gli vuole presentare Piero da Gianni.
In (209), fare assigns its external theta-role to the matrix subject while presentare assigns its external theta-role to AGR and raises to this position. Affixal AGR is not in an A-position and may be doubled by an adjunct NP, as in (211):

(211) Mario, [VP gli fa [VP presentare Piero e, da Gianni]]

θ₁ₖ

In the modal structure (210), volere assigns its external theta-role to the matrix subject while presentare assigns its external theta-role to the embedded AGR. As AGR is controlled by the matrix subject, doubling the embedded external argument creates a principle C violation, as shown in (212), where the adjunct NP Gianni is bound by the matrix subject Mario:

(212) *Mario, [VP gli vuole [VP presentare Piero e, da Gianni]]

θ₁₁

Rizzi (1982) notes that essere and avere may either follow a modal, as in (197b), or precede one, as in (208), but may not both precede and follow a modal. The rule of restructuring he proposes would be blocked in structures containing the sequence Aux – V – Aux – V, in order to rule out Ss like (213) and (214):

(213) *Mario lo avrebbe dovuto aver finito.
    (Mario it has should have finished)

(214) *Piero gli a/è voluto essere presentato.
    (Piero to him has/is wished to be presented)

If modals are auxiliaries in NP raising and clitic climbing structures in Italian, then no special rules are needed. (213) and (214) are excluded by the rules which govern sequences of auxiliaries in a simple T-chain. (213) is ruled out by (40a), which disallows two auxiliary verbs with the same syntactic function within a T-chain. Such rules are independently necessary to filter out simpler Ss like (215), as well as e.g. (27) above:

    b. *Mario has had finished it.

The raising structure (214) is ruled out with avere as the higher auxiliary, because a raising structure contains a head verb with a CTC complement, which obligatorily takes auxiliary essere.
We can account for the ungrammaticality of (214) with essere as the higher auxiliary if we assume that essere functions as a neutral auxiliary only when it governs another instance of essere. In (214), the first essere is not contiguous to the second. Therefore it is construed by sequence of auxiliary constraints as governing lexical volere, not auxiliary volere, so that raising from embedded object position is excluded by the ECP.

If rule (40a) is correct, then the contrast in (216) supports the hypothesis that a modal structure without clitic climbing contains two distinct T-chains while one with clitic climbing contains a single T-chain:

(216)    a. Mario avrebbe dovuto averlo finito.
         b. *Mario lo avrebbe dovuto aver finito. (= (215a)).

References

Zagona, K. (to appear) “Proper Government of Antecedentless VP in English and Spanish”.

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