Verb Movement and the Status of Subjects: Implications for the Theory of Licensing

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1 Introduction

Over the last decade generative grammar has moved away from using phrase structure rules as the basic specifiers of syntactic structure; instead, the theory has come to see phrase structure as the instantiation of a number of licensing relations, chiefly θ-role assignment, case, agreement, and predication[1]. The licensing of phrase structure has, however, been conceived in a static way: although the elements being licensed may move in the course of a derivation in order to reach the positions in which licensing takes place, the positions themselves are fixed for each relation. In this paper we explore the consequences of abandoning this static view, and taking instead a dynamic approach in which the licensing positions themselves may change in the course of a derivation.

In essence, we will argue that a licensing relation holding between two elements α and β is satisfied whenever α and β are in the relevant configuration (*e.g.* head-complement, head-specifier); there is no motivation for restricting the satisfaction of the relation to the underlying positions of α and/or β. Instead, we will show that something close to the converse is true: given economy assumptions along the lines of Chomsky 1991, 1992, a licensing relation will necessarily be satisfied by the highest position in a chain at which the relevant licensing configuration occurs. Consequently, a given trace can appear only if at least one of the licensing relations in which it participates is not also satisfied by some position higher in its chain.

In what follows we will show that this new view of how structure is licensed straightforwardly accounts for a wide range of otherwise problematic data. We focus initially on a well-known problem concerning coordination in the verb-second Germanic languages, that of so-called "SLF" or "subject gap" coordination, and then turn to other facts in these languages and in English. The organization of the paper is as follows: In Section 2 we present the coordination problem and argue that no satisfactory analysis of it is possible under the current static view of phrase-structure licensing. In Sections 3 and 4 we present our approach to licensing, and show that it provides a straightforward account of the coordination facts. Then, in Section 5, we argue that our account leads to explanations for a range of phenomena besides coordination, including the properties of subject questions in English (Section 5.1), the distribution of weak pronouns in the modern Germanic languages and in Old English (Section 5.2), the non-ambiguity of subject-initial matrix clauses (Section 5.3) and constraints on the topic position in Yiddish (5.4).

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We welcome comments on this paper, which should be sent directly to us.

2 The problem of SLF-Coordination

The verb-second Germanic languages exhibit a type of coordination that appears to violate well-established generalizations regarding constituency in coordinate structures. Its hallmark is that the second conjunct shares the subject of the first clause even though the first clause subject occurs *after* its tensed verb. We illustrate the construction in (1)[2]:

(1)a. In Mainz fährt **Karl** am Abend los und kommt am Morgen in Bonn an.
in goes at evening PRT and comes at morning in PRT
Karl will leave Mainz in the evening and will arrive in Bonn in the morning.

b. Das Gepäck ließ **er** fallen und rannte zum Hinterausgang
the(ACC) baggage let he fall and ran to-the rear-exit
He dropped the baggage and ran to the rear exit.

This construction is discussed in detail in Höhle 1983 and is there dubbed SLF-coordination (for "**S**ubjekt**l**ücke" (subject gap) in a clause where the verb is "**f**init/**f**rontal" (finite and fronted))[3].

SLF-coordination in the verb final Germanic languages exhibits two crucial features:

(2)a. The shared constituent [*Karl* in (1a), *er* in (1b)] is not in the Spec(CP) position in the first clause, but rather in Spec(IP).
b. In the second conjunct, the tensed verb is not in final position.

Given three widely held and well-motivated assumptions—two about the nature of constituent coordination and one about the phrase-structure of German and Dutch—we arrive at a paradox. The assumptions are as follows[4]:

(3)a. Only like categories coordinate.
b. In a constituent coordination, the shared element must be outside the first conjunct (this constraint is demonstrated in Höhle 1983).
c. German is Infl-final and Verb-final but Comp-initial, with finite verb fronting being movement to C^0.

The paradox is this: By assumption (c) the second conjunct in (1a,b) must be a projection of C^0; since no XP precedes the verb, we may assume that the second conjunct is a C′[5]. Therefore, by assumption (a), it must be conjoining with another C′. Then by assumption (b) the shared element must be outside the initial C′. Clearly, however, this is not the case: the shared element is in Spec(IP) in the first clause, and so the sentence is incorrectly predicted to be ungrammatical.

[2] In (1a) the XP occupying the initial Spec(CP) position is an adjunct; in (1b) it is an argument. In Dutch this construction is more acceptable when the initial XP is an adjunct. Thus, many speakers judge the Dutch equivalent of (1b) and similar examples to be marginal. The difference between Dutch and German arises because, as will become clear in Sections 2 and 4.2, SLF-coordination necessarily involves Across-The-Board violations (*cf.* Ross 1967, Williams 1978), and Dutch is less permissive with respect to the ATB constraint than German.

In this paper we will explicitly discuss SLF-coordination only as it appears in the verb final languages, German and Dutch; but we believe that our analysis carries over directly to the SVO Germanic languages as well.

[3] More recent discussions of this construction include Wunderlich 1988, Höhle 1990, Steedman 1990, Fanselow 1991, Zwart 1991b, Kathol 1992, van Zonneveld 1992. These authors refer to the construction in various ways, including *SGF-Coordination*, and coordination with *Subject Deletion*.

[4] The assumptions in (c) are disputed in Travis 1984, 1991, Zwart 1991a, 1991b, among others. This issue will be discussed in more detail in Section 5.

[5] The possibility that the second conjunct is not a verb-initial X′, but rather an XP with an empty category in initial position will be discussed in Section 4.1.

One might suppose that the weakest assumption here is (b); but as Höhle shows, the class of apparent exceptions to (b) is very narrowly defined: the apparently non-initial shared constituent must be the subject of the topmost IP of the first conjunct; while (4a) is grammatical, (4b), in which the shared constituent is an internal argument, is not:

(4)a. Die Briefmarken hat **Claus** gekauft und
the(ACC) stamps has bought and
will sie jetzt wieder verkaufen.
wants them now again sell
Claus$_i$ bought the stamps, and now [he$_i$] wants to sell them again.

b. *Claus hat **die** **Briefmarken** gekauft und
has the(ACC) stamps bought and
hat Barbara sofort wieder verkauft.
has immediately again sold.
Intended reading: *Claus bought the stamps$_i$,*
and Barbara immediately sold [them$_i$] again.

Given this fact, we propose (see also Zwart 1991b) that assumption (b) continues to hold in SLF-coordination, and hence that the first conjunct in examples like (1) and (4a) is not the initial C′, but rather the I′ contained within it. Thus, a first approximation to the structure of (1b) is as in (5):

(5) [$_{CP}$ Das Gepäck$_l$ [$_{C'}$ ließ$_j$ [$_{IP}$ er$_i$ [$_{I'}$ t_l fallen t_j] und
[$_{C'}$ rannte$_k$ [$_{IP}$ t_i zum Ausgang t_k]]]]]

Since in this structure the first conjunct is only the initial I′, the construction now respects the constraint that the shared element be outside the first conjunct. However, the structure in (5) clearly violates assumption (a), that conjuncts must be of the same syntactic category[6].

A number of authors, including Holmberg 1986, Taraldsen 1986, Rizzi 1990, and Heycock 1991, propose that a C′ in which C^0 is occupied by a verb constitutes a predicate; and it is known that in some circumstances predicates of different syntactic categories may coordinate, as shown in the examples in (6), from Sag *et al.* 1985:

(6)a. Pat is [$_{NP}$ a Republican] and [$_{AP}$ proud of it].
b. I am both [$_{VP}$ expecting to get the job] and
[$_{PP}$ of the opinion that it is a desirable one].

We might argue, therefore, that (1a,b) and (4a) are examples of unlike predicate coordination, hence justified exceptions to assumption (a).

This simple solution cannot be adopted, however, since I′ and C′ predicates cannot, in general, coordinate. Such coordination is possible only when the shared constituent functions as the subject of the highest I′ in the second conjunct. If I′ coordination with C′ were generally available, we would expect an example like (7) to be grammatical, but it is not. In this example the shared constituent functions in the second conjunct as a CP-initial topic extracted from the subject position of an embedded IP[7]:

[6]The structure in (5) also violates the requirement that extraction be Across-The-Board, since the initial constituent *das Gepäck* and the tensed verb *ließ* have been extracted unilaterally from the first conjunct. We address this problem in Section 4.2.

[7]Note that the topicalization of an embedded subject is grammatical, with the result that (i) is grammatical under the relevant interpretation:

(i) Margot glaubt jeder sei im Bett gelieben.

(7) *Gestern ist Margot$_i$ [$_{I'}$ krank gewesen] und
yesterday is sick been and
[$_{C'}$ glaubt [$_{IP}$ jeder t_i sei im Bett geblieben]].
believes everyone is in-the bed stayed
Intended reading: *Yesterday Margot$_i$ was sick and everyone believes [she$_i$] stayed in bed.*

Example (7) should be compared to the acceptable (8), in which the shared constituent functions as a CP-initial topic extracted from the subject position of the highest IP in the second conjunct:

(8) Gestern ist Margot$_i$ [$_{I'}$ krank gewesen] und
yesterday is sick been and
[$_{C'}$ hat [$_{IP}$ t_i deshalb den ganzen Tag im Bett verbracht]].
has therefore the whole day in-the bed spent
Yesterday Margot$_i$ was sick, and therefore [she$_i$] spent the whole day in bed.

The ungrammaticality of (7) shows that I′ and C′ cannot in general be coordinated, even when the case of the shared constituent—here *Margot*—is not an issue.

The same conclusion can be reached on the basis of a slightly different set of data from Dutch, as shown by Zwart 1991b. Zwart gives (9) [his (1b)] as an instance of acceptable, if slightly awkward, SLF-coordination:

(9) ?Na Zwolle rijdt deze trein verder als intercity naar Groningen en
After goes this train on as intercity to and
zal alleen stoppen te Assen.
will only stop in
After Zwolle this train goes on as an intercity to Groningen and will only stop in Assen.

In addition, Dutch quite freely allows coordination of C′s, even when the shared initial element is topicalized from the IP-subject position in the first conjunct and from object position in the second, as shown in (10) [Zwart's (13b)][8]:

(10) ?Die trein$_i$ [$_{C'}$ is [$_{IP}$ t_i veel te vroeg vertrokken]], maar
that train is far too early left but
[$_{C'}$ had [$_{IP}$ ik anders t_i makkelijk kunnen halen]].
had I otherwise easily can catch
That train$_i$ left far too early, but otherwise I could have caught [it$_i$] easily.

Given (10), if we took the grammaticality of (9) to show that an I′ and a C′ can coordinate, we would predict grammaticality for (11) [Zwart's (12)], which is just like (9) except that the shared element is topicalized from the object position in the second conjunct:

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believes everyone is in-the bed stayed.
Margot, everyone believes stayed in bed.

[8]This type of coordination appears to be highly marginal in German, even when the morphology of the shared constituent is compatible with both of the cases appropriate for the gaps. We will not discuss this difference, but it appears to be related to the much more limited extent of case-syncretism in German.

(11) *Na Zwolle zal deze trein$_i$ alleen stoppen te Assen en
after will this train only stop in and
moet je dus t_i niet nemen als je in Meppel moet zijn
must you therefore not take if you in must be
After Zwolle, this train$_i$ will only stop in Assen, and
so you don't want to take [it$_i$] if you have to be in Meppel.

As indicated, however, (11) is ungrammatical. Thus, we once again see that an I′ and a C′ can only coordinate when the shared element functions as the subject of the highest I′ in the second conjunct.

3 The satisfaction of licensing relations

3.1 General constraints on licensing

There are two positions licensed by heads: complements and specifiers. Complement positions are licensed by θ-assignment, or by selection (as in the relation between I^0 and VP). Specifier positions are licensed by predication, by agreement, and possibly by case-assignment, if this is independent of agreement (see below). As stated in the introduction, we propose that these licensing relations can be satisfied whenever the two elements involved are in the relevant configuration with respect to each other. In addition, following the work of Chomsky 1991, 1992, we propose the following principle governing the projection of structure from syntactic heads:

(12) **Principle of Minimal Satisfaction**
The structure projected from syntactic heads is the minimum within which all the licensing relations in which they participate can be satisfied.

Now, observe that in a German matrix clause, given the currently standard notion of derivation, a V^0 that has moved to C^0 and the trace of that verb in I^0 may be entering into the same licensing relations. Consider the sentence in (13):

(13) [$_{CP}$ Er$_i$ [$_{C'}$ rannte$_j$ [$_{IP}$ t_i [$_{I'}$ [$_{VP}$ zum Ausgang t_j] t'_j]]]]
he ran to-the exit
He ran to the exit.

Let us assume that nominative case in German is assigned via Spec–Head agreement with the V^0+I^0[+finite] complex[9] and, in addition, that any [+V] head projects a predicative constituent which licenses a specifier position. Then, in (13), the V^0 that has moved into C^0 is in a Spec–Head relation with an element (the initial noun phrase) with which it agrees, to which it assigns nominative case, and which can function as the subject of the predicate that it heads. Turning to the trace of V^0 in I^0—t'_j, we note that it also is in a Spec–Head relation with an element (the trace of the initial noun phrase—t_i) with which it agrees, to which it can assign nominative case, and which can function as the subject of the predicate that it heads. Thus, the relations that hold between the heads of the chains are duplicated by the relations between their traces. Also, as we will see, these traces enter into no other licensing relations. The representation in (13), then, does not respect the hypothesis put forward in (12), according to which the structure projected must be the minimum required for the satisfaction of the relevant licensing relations. We propose, then, that (13) is not a possible structure for the sentence; since the traces in I^0 and Spec(IP) are not required for the satisfaction of any licensing relation, they must delete.

[9] It has been argued that nominative case in German is assigned under government by a [+Finite] feature in C^0. The consequence of this for our proposal concerning licensing relations is discussed in Section 3.2.3 below.

We assume that deletion of a trace results in the disappearance of the category that dominates it and, further, that, if the trace of a head is deleted, its entire projection vanishes along with it. This behavior is virtually required by any constrained theory of phrase structure that projects structure from heads. Under these assumptions, the deletion of the unlicensed traces in I^0 and Spec(IP) yields the structure in (14) for sentence (13), rather than the one given above:

(14) $[_{CP/IP}$ Er $[_{C'/I'}$ rannte$_j$ $[_{VP}$ zum Ausgang t_j]]]

The trace of the verb in the VP—t_j in (14)—does not delete, as it licenses the arguments of the verb via θ-role assignment. Since, in this structure, all the functions of I^0 are carried out by C^0, the C′ exhibits—in addition to its own properties—all the properties of an I′, including the possibility of coordinating with another I′, as it does in (1), (4a), (8), and (9) above.

Thus, the hypothesis in (12) directly predicts the existence of SLF-coordination, which becomes, not a type of coordination, but an effect, observable in coordinate structures, of the interaction between licensing relations and the projection of phrase structure. In the rest of this section we further discuss licensing, detailing the types of licensing and discussing how derivations proceed in the general case. We will show that our new view of derivations allows one to solve a range of problems in a simple way, including the problem of SLF-coordination.

3.2 Licensing relations

3.2.1 Predication

One of the relations that license phrase structure is predication. As proposed by Williams 1980 and Rothstein 1983, a syntactic predicate is not a lexical head, but rather a phrasal projection, which licenses—and requires—a subject external to it. We understand the specifier position to be external in the relevant sense, since we follow the proposal made by Hoekstra 1991 and Fukui 1992, who argue that there is no need for a distinction between adjuncts and specifiers that is independent of agreement: rather, a specifier is an adjunct that agrees with the head. A [+V] category always projects a predicate (Heycock 1991), and hence licenses and requires an external subject. When a tensed verb moves from I^0 to C^0, and some XP occurs in Spec(CP), that relation holds at the CP level. Under our proposal, since the head of the predicate and the subject of that predicate are in the right configurational relation for this licensing requirement to be satisfied, they do satisfy it, and hence the relation is not available to license the occurrence of any traces, although a trace of either element may, of course, still be required for other reasons (see below).

3.2.2 Agreement

A second licensing relation that may hold between a head and its specifier is that of agreement. For most of the phenomena discussed in this paper, it is sufficient to assume that there is one functional head between C^0 and the VP, namely I^0. When I^0 is finite it must stand in a Spec–Head relation with a noun phrase with which it agrees.

In an example like (13), in which the agreeing noun phrase has moved to Spec(CP) and the V^0+I^0 complex has moved to C^0, this relation obtains between these elements themselves. Consequently, agreement cannot license the existence of a trace of either of the elements involved. Thus, in (13), neither predication nor agreement licenses the trace of the verbal complex in I^0 or the trace of the initial noun phrase in Spec(IP). If no other relation licenses them, they obligatorily delete, as illustrated in (14) above. In an example like (15) below, on the other hand, a non-subject XP has moved into Spec(CP), so that the V^0+I^0 complex does not stand in a Spec–Head relation with the noun phrase with which it agrees:

(15) $[_{CP}$ Das Gepäck$_i$ $[_{C'}$ ließ$_j$ $[_{IP}$ er $[_{I'}$ $[_{VP}$ t_i fallen $t_j]$ $t'_j]]]]$.
the baggage let he fall
He dropped the baggage.

As a result, the trace of the verbal complex in I^0—t'_j—cannot delete, because it is required to instantiate the Spec–Head agreement relation with the subject in Spec(IP).

Although for most of the discussion in this paper we shall assume that I^0 is a single functional head—partly for clarity of exposition—it should be noted that our account is completely consistent with the proposal, adopted by a number of researchers beginning with Pollock 1989, that I^0 should be split into two separate functional heads, T[ense] and Agr[eement]. In fact, some phenomena in Old English and Yiddish that we discuss later in this paper may be best handled by such an analysis, as we will indicate in the relevant sections.

3.2.3 Nominative case-assignment

If nominative case is always assigned via Spec–Head agreement with the V^0+I^0[+finite] complex, then what we have said for the agreement relation extends trivially to the relation of nominative case-assignment. However, it has been argued that nominative case in German is assigned under government by a [+Finite] feature in C^0 (Platzack 1986, Platzack and Holmberg 1989, Santorini 1992).

This alternative proposal does not affect our analysis, given the assumption that a finite I^0 must be in a Spec–Head relation with an agreeing noun phrase or its trace, whether or not this is the relation that results in nominative case assignment. Consider again the two relevant configurations in a V2 sentence: first, the configuration in which the nominative subject moves to Spec(CP), as in (13)/(14); and second, the configuration in which some other element moves to Spec(CP) and the nominative subject remains in Spec(IP), as in (15).

If the subject moves to Spec(CP), as in (13), then it cannot be assigned nominative case in this position (on the assumption that a head does not govern its specifier (Koopman and Sportiche 1991, Santorini 1992)). There must therefore be some trace of the subject being assigned case in a position governed by the [+finite] feature in C^0. In principle, this position could be either Spec(IP) or Spec(VP), assuming the VP internal subject hypothesis (*cf.* Fukui 1986, Fukui and Speas 1986, Sportiche 1988, Koopman and Sportiche 1991, among others). However, since all of the relations entered into by I^0 are entered into by the verbal complex in its S-Structure position, there is no motivation for a trace of the verbal complex in I^0. Hence, the trace in I^0 deletes. This deletion removes the Spec(IP) position from the phrase structure and raises the question of what happens to the trace that it contains. Two possibilities suggest themselves. The first is that the phrase in Spec(IP) is detached from the phrase structure when the I projection deletes and so must itself delete. The second possibility is that the phrase in Spec(IP) becomes an adjunct of VP. Under the first scenario, the resultant structure will be as in (16):

(16) $[_{CP/IP}$ Er$_i$ $[_{C'/I'}$ rannte$_j$ $[_{VP}$ t_i $[_{V'}$ zum Ausgang t_j $]]]]$

Here the deletion of the entire I projection leaves the remaining subject trace in Spec(VP) in a position governed by C^0; hence nominative will be assigned to it. Under the second scenario, there will be a trace of the subject adjoined to VP in the output structure and it is the adjoined trace that receives nominative case from C^0. For the sake of compatibility with our discussion of case-assignment under Spec-Head agreement we will assume the first scenario in this paper.

What if a non-subject constituent moves to Spec(CP), as in (15)? Here, presumably, the noun phrase requiring nominative may receive it directly from the verbal complex in C^0. But independently of this—and crucially for our analysis—there must be a trace of the verbal complex that can enter into

the relation of agreement. The important point is that in this scenario—when the nominative subject in its final position is not in a Spec–Head relation with the verbal complex—that complex cannot itself enter into all the licensing relations it supports, and so it must leave a trace. Hence, such a CP is predicted not to exhibit the properties of IP:

(17) $[_{CP}$ Das Gepäck$_i$ $[_{C'}$ ließ$_j$ $[_{IP}$ er $[_{I'}$ $[_{VP}$ t_i fallen t_j] t'_j]]]]

3.2.4 Complementation

As we have seen, the proposal that the licensing relations entered into by the verbal complex can all be satisfied at the CP level is straightforward as far as specifier–head relations are concerned. We now turn briefly to the satisfaction of the head–complement relations. The requirement that C^0 take an I-headed complement is satisfied by the incorporation of I^0 into C^0 that takes place as a result of head movement. The same is true for the selection of a V-headed complement by I^0.

The only remaining problem is the direction of licensing. In German, C^0 licenses a complement to its right, while I^0 licenses a complement to its left. Clearly, however, the verbal complex that occupies C^0 after movement has no complement to its left. Thus, if this complex leaves no trace in I^0, I^0 will no longer have a complement to its left. To understand why this does not result in ungrammaticality, observe that there is no reason to suppose that information about the linear order of head and complement is checked at LF. We may presume that headedness is a morphosyntactic property that does not have to be preserved at LF, but regulates only the initial structure (Michael Hegarty, personal communication). Thus, for example, the VP will be generated to the left of I^0, the head that selects it, but if head-movement of I^0 alters this ordering, this will not result in any violation at LF, and hence will not affect grammaticality.

3.3 Expletive replacement and LF chains

In recent work, Chomsky 1992 argues against the existence of S-Structure as a level of representation over which constraints can be stated. In the cases of SLF-coordination that we have been considering, the LF and S-Structure representations of movement chains do not differ, so that the data presented so far do not bear on Chomsky's proposal. In the case of chains containing expletives, however, these two representations would diverge: consequently, different predictions follow from taking the constraints on well-formed coordinations in (3a,b) to hold at S-Structure or at LF.

In at least some cases, SLF-coordination is possible when Spec(IP) is occupied by an expletive, rather than by the nominative logical subject itself (Jack Hoeksema, personal communication). We illustrate with a Dutch example:

(18) Toen kwam er een jager an en
then came there a hunter PRT and
schoot het haasje doot.
shot the rabbit dead.
Then there arrived a hunter and shot the rabbit dead.

At S-Structure, this example would violate the condition that the shared element cannot be contained in the first conjunct, since here Spec(IP) in the first clause is occupied by the expletive *er*, while the shared lexical subject, *een jager*, occurs in some lower position, presumably Spec(VP). However, assuming the account of Chomsky 1986, according to which expletives are replaced at LF, the LF representation of (18) is exactly parallel to that of all the other grammatical cases of SLF-coordination that we have discussed so far. At LF the nominative noun phrase *een jager* is in Spec(IP) in the initial

conjunct, and so can function as the subject of the second I′/C′. The acceptability of examples like (18) requires that the well-formedness conditions on coordination be checked at LF.

Independent evidence that supports an expletive replacement analysis for examples like (18) can be found in the interaction of this construction with extraposition. A relative clause modifying the subject may be extraposed in an SLF coordination, as illustrated in (19):

(19) Toen kwam een meisje binnen en begon te praten
then came a girl in and began to talk
dat nog nooit gesproken had.
that yet never spoken had
Then a girl came in and began to talk, who had never spoken before.

A relative clause modifying an argument internal to the initial conjunct, on the other hand, may not be extraposed. (20) is sharply ungrammatical:

(20) *Toen gooide mijn vriend een speelgoed weg en verliet de kamer
then threw my friend a toy away and left the room
dat kapot was.
that broken was
Intended reading: *Then my friend threw away a toy that was broken and left the room.*

Crucially, extraposition of a relative clause modifying the associate of an expletive is possible: that is, extraposition from the associate of an expletive patterns with extraposition from an IP-subject, rather than from an internal argument:

(21) Toen kwam er een meisje binnen en begon te praten
then came there a girl in and began to talk
dat nog nooit gesproken had.
that yet never spoken had
Then a girl came in and began to talk, who had never spoken before

This pattern can be explained if the constraints on extraposition are checked at LF—but only if the associate of the expletive replaces it at this level, as we have argued it must.

In addition to providing further support for Chomsky's proposal that LF is the level at which all syntactic conditions must be met, the interaction of SLF-coordination with expletive constructions sheds new light on the nature of expletive replacement itself. As pointed out in Williams 1984, the associate of English expletive *there* cannot have the wide scope interpretation that would be available to a noun phrase in the position of the expletive. In (22b), unlike (22a), *no one* cannot take scope over the modal:

(22)a. No one must be in the house.
b. There must be no one in the house.

Chomsky 1991 recognizes that the obligatorily narrow scope for the associate in examples like (22b) is surprising under the proposal that the associate necessarily replaces the expletive at LF, and argues instead that the associate adjoins to the expletive, although exactly how this guarantees the correct scope is left unresolved (Chomsky 1991, footnote 44). The data from coordination, however, suggest that the LF position of the associate determines its range of scope interpretations, and that we must reject the assumption that LF-raising of the associate takes place in English examples like (22b).

Although examples of coordination like (18) are grammatical, examples of SLF-coordination where the associate of the expletive necessarily takes narrow scope are ungrammatical:

(23) *Gisteren huilde er niemand en
yesterday cried there no one and
werd getroost door zijn moeder.
was comforted by his mother
Intended reading: *Yesterday no one cried and was comforted by his mother.*

Similarly, examples where the verb taking the expletive subject is existential are degraded in acceptability. Compare (24a) with the acceptable (24b):

(24)a. ??Op het feest was er iemand die ik niet kende en
at the party was there someone who I not knew and
maakte een ruwe opmerking over mijn moeder.
made a rude remark about my mother
Intended reading: *Someone was at the party and made a rude remark about my mother.*

b. Op het feest lachte er iemand en
at the party laughed there someone and
maakte een ruwe opmerking over mijn moeder.
made a rude remark about my mother
At the party someone laughed and made a rude remark about my mother.

The contrast between (18) and (24b) on the one hand, and (23) and (24a) on the other, suggests that if the associate of an expletive must take narrow scope, whether because of the type of quantifier involved or the use of an existential verb, it cannot raise to replace the expletive at LF, and hence cannot be the shared subject in a coordination.

Parallel data exist in German. In this language the expletive is phonetically null (*cf.* Safir 1985), making it hard to construct unambiguous examples, but the possibility of the nominative noun phrase following the dative in examples like (25a) can be explained on the assumption that it is the associate of a null expletive in Spec(IP):

(25)a. Dieses Jahr hat dem Ausschuß kein Bewerber gefallen
this year has the(DAT) committee no(NOM) applicant pleased
This year no applicant pleased the committee.

b. $[_{CP}$ Dieses Jahr $[_{C'}$ hat$_j$ $[_{IP}$ *expl*$_i$ $[_{I'}$ $[_{VP}$ dem Ausschuß kein Bewerber$_i$ ...

Just as we have seen for Dutch, an SLF-coordination where the first conjunct corresponds to (25) is ungrammatical. Compare the ungrammatical (26a), in which Spec(IP) is occupied by the null expletive and the associate is *kein Bewerber* ('no applicant'), as in (25), with the acceptable coordinations in (26b), in which the associate of the expletive is a definite, and (26c), in which *kein Bewerber* is in Spec(IP):

(26)a. *Dieses Jahr hat dem Ausschuß kein Bewerber gefallen und
this year has the committee no applicant pleased and
ist abgelehnt worden.
is rejected been
Intended reading: *This year, no appplicant pleased the committee and was rejected.*

b. Dieses Jahr hat dem Ausschuß mein bester Freund gefallen und
this year has the committee my best friend pleased and

ist angestellt worden.
is hired been
This year, my best friend pleased the committee and was hired.

c. ?Dieses Jahr hat kein Bewerber dem Ausschuß gefallen und
this year has no applicant the committee pleased and
ist abgelehnt worden.
is rejected been
This year no candidate has pleased the committee and been rejected.

The contrast between (26a) and (26b,c), like the Dutch data, suggest that expletive replacement must be impossible in examples like (25) and (26a)[10].

4 Further issues in coordination

Before presenting some further consequences of our account of the effect of movement on licensing relations, in this section we discuss two general issues that arise in the analysis of coordination and how they affect our proposal.

4.1 The representation of coordinate structures

We have proposed that SLF-coordination be analyzed as coordination of an initial I′ conjunct with an I′/C′ conjunct, and that the IP-subject is therefore not contained in either of the conjuncts. A possible alternative would be an analysis along the lines of Van Valin 1986, according to which there would be an empty category serving as the subject of the second conjunct. We do not adopt such an alternative, as the arguments against Van Valin's analysis given by Godard 1989 apply equally in cases of SLF-coordination. To give only one example, consider the following German coordination:

(27) *Um drei Uhr war jeder$_i$ angekommen und er$_i$ hatte seine$_i$ Freundin geküsst
at three o'clock was everyone arrived and he$_i$ had his girlfriend kissed
At three o'clock everyone$_i$ had arrived and he$_i$ had kissed his$_i$ girlfriend.

This sentence, like its English translation, is ungrammatical because a quantifier like *jeder* can only bind a pronoun that it c-commands. That requirement is not met in this coordinate structure: neither of the pronouns in the second conjunct is c-commanded by *jeder*.

The following SLF-coordination, however, is acceptable, showing that the subject of the second conjunct cannot be any type of pronoun:

(28) Um drei Uhr war jeder$_i$ angekommen und hatte seine$_i$ Freundin geküsst
at three o'clock was everyone arrived and had his girlfriend kissed
At three o'clock everyone$_i$ had arrived and had kissed his$_i$ girlfriend.

[10] In contrast to German examples like (26c), in Dutch the following coordination, in which the quantified subject appears to be in Spec(IP), is ungrammatical:

(i) *Gisteren huilde niemand en werd getroost door zijn moeder.
yesterday cried no one and was comforted by his mother
Intended reading: *Yesterday no one cried and was comforted by his mother.*

This may indicate that Dutch, like German, has a null expletive, but that, in contrast to German, a negative existential quantifier cannot appear in Spec(IP). We leave this as a problem for further research.

Van Valin attributed the acceptability of English sentences similar to (28) to the possibility of VP-coordination (which would not involve a null pronoun), but, as Godard shows, this is not a possible solution, as the same effect is found even when the verbs in the two conjuncts are of different tenses (Godard 1989, p. 20).

Further evidence against the possibility that SLF-coordination involves XP conjuncts, each containing a subject, is provided by relative clause extraposition (this argument is due to Kathol 1993). As shown by (19) above, repeated here as (29), a relative clause modifying the shared subject in an SLF-coordination can be extraposed:

(29) Toen kwam een meisje binnen en begon te praten
then came a girl in and began to talk
dat nog nooit gesproken had.
that yet never spoken had
Then a girl came in and began to talk, who had never spoken before.

However, when full CP/IPs are coordinated such extraposition is impossible:

(30)a. *Een meisje kwam binnen en ze had een brede glimlach
a girl came in and she had a broad smile
dat ik in jaren niet gezien had.
that I in years not seen had
Intended reading: *A girl came in who I hadn't seen in years and she was smiling broadly.*

b. *Toen kwam een meisje binnen en ze had een brede glimlach
then came a girl in and she had a broad smile
dat ik in jaren niet gezien had.
that I in years not seen had
Intended reading: *Then a girl came in who I hadn't seen in years and she was smiling broadly.*

If the second conjunct in an SLF-coordination was a full CP/IP like the second conjunct in (30a,b), then (29) and (30b) would have exactly the same structure, and the clear contrast between them would be unexplained.

The acceptability of the following coordination might appear to argue for some version of Van Valin's solution, on the assumption that *entweder* ('either') marks the left boundary of the first conjunct (Hubert Haider, personal communication):

(31) ?Gestern ist entweder Klaus in die Stadt gefahren oder
yesterday is either in the town driven or
hat dem ganzen Tag im Bett verbracht.
has the whole day in bed spent.
Yesterday either Klaus went into town or spent the whole day in bed

However, this example only supports the idea that the first conjunct should contain the IP-subject if *entweder* always appears at the edge of the first conjunct. In fact, however, while *entweder* is most felicitous when adjacent to the coordinated constituent, it can also appear higher in the structure, as shown in (32):

(32)a. ... weil er die Briefe entweder verlor oder zerstörte
because he the letters either lost or destroyed

... *because he either lost or destroyed the letters*

b. ?... weil er entweder die Briefe verlor oder zerstörte
because he either the letters lost or destroyed
... *because he either lost or destroyed the letters*

This behavior of *entweder* is paralleled by the behavior of *nur* ('only'), which is also most felicitous when adjacent to the focussed constituent, but possible in a higher position:

(33)a. ... weil ich Briefe nur lese, nicht schreibe
because I letters only read, not write
... *because I only read letters, but don't write them*

b. ?... weil ich nur Briefe lese, nicht schreibe
because I only letters read, not write
... *because I only read letters, but don't write them*

Similar behavior is exhibited by English *either*:

(34)a. He either came or stayed home.
b. ?Either he came or stayed home.

Thus, the possible placement of *entweder* to the left of the subject in (31) does not allow us to conclude that this subject is contained in the first conjunct.

In sum, the arguments against postulating an empty category in initial position of the second conjunct given by Godard for English hold also in German, and we therefore continue to assume that the second conjunct is not a CP/IP with an initial empty category, but rather a C′/I′. The grammaticality of (31) is quite consistent with this conclusion, since there is independent evidence that *entweder* does not necessarily mark the left edge of the first conjunct, as its semantic scope can be narrower than its sister constituent.

It should be noted, however, that our proposal is largely independent of the question of whether the right conjunct is an XP with an empty category in initial position or an X′. Suppose for a moment that, *contra* Godard 1989 and the discussion above, there is an empty category in the second conjunct[11]. On the basis of the pattern observed in straightforward non-SLF coordinations we know that this empty category is subject to two constraints: (1) it is obligatorily bound by the constituent in initial position in the first conjunct; (2) it must be initial in its own conjunct. Turning then to SLF coordination, we see that by (1) the first conjunct must be the IP contained in the initial CP, rather than the CP itself; by (2), and the assumption that V2 clauses in German are CPs, the empty category must be in the initial postion of a CP conjunct. What then remains unexplained is, again, why a projection of I^0 can coordinate with a projection of C^0, and why—in this case alone—the empty category in Spec(CP) of the second conjunct has to have been topicalized from the subject position of the highest IP (as shown by the ungrammaticality of (7) and (11) above). These two problems are exactly those resolved by our proposal that a subject-initial CP is in fact non-distinct from an IP.

4.2 Across-The-Board violations

Before concluding our discussion of coordination, we would like to address one possible objection to our analysis—and in fact to any other analysis, e.g. that of Zwart 1991b, which proposes that in

[11] Rögnvaldsson 1982 argues that some coordinations in Icelandic require an analysis that does not involve sharing the single overt subject. As Bresnan and Thráinsson 1990 show, however, there are problems in interpreting his results as an argument for Van Valin's approach.

SLF-coordinations the first conjunct is the I′ contained in the initial C′, rather than the C′ itself. The objection is that such analyses result in structures violating the Across-The-Board Constraint on extraction from coordinate structures (Ross 1967, Williams 1978).

In all of our declarative examples, some XP has been extracted from the first conjunct to occupy Spec(CP) and there is no parallel extraction from the second conjunct[12]. We illustrate with the example in (1b), repeated here as (35) (irrelevant detail suppressed):

(35) [$_{CP}$ Das Gepäck$_i$ [$_{C'}$ ließ$_j$ [$_{IP}$ er [$_{I'}$ t_i fallen t_j]] und
[$_{C'/I'}$ rannte zum Ausgang]]]

While we can offer no precise analysis of the conditions under which such violations of the ATB constraint are acceptable, we note that unilateral extraction from the leftmost of a pair of conjuncts in other instances of coordination does not necessarily lead to ungrammaticality. The examples in (36) are not SLF-coordinations, but simple VP-coordinations; not only the subject, but also the tensed verb is "shared":

(36)a. Die Kommission will [$_{VP}$ diesem Vorschlag folgen] und
the committee wants this suggestion follow and
[$_{VP}$ eine neue Unterkommission einsetzen].
a new subcommittee set up
The committee wants to follow this suggestion and set up a new subcommittee.

b. Du sollst [$_{VP}$ das Gepäck sofort fallen lassen] und
you should the luggage immediately fall let and
[$_{VP}$ zum Ausgang rennen].
to-the exit run
You should immediately drop the baggage and run to the exit.

Such VP-coordinations also allow unilateral extraction out of the first conjunct, in violation of the ATB constraint:

(37)a. Diesem Vorschlag$_i$ will die Kommission [$_{VP}$ t_i folgen] und
[$_{VP}$ eine neue Unterkommission einsetzen].

b. Das Gepäck$_i$ sollst du [$_{VP}$ t_i sofort fallen lassen] und
[$_{VP}$ zum Ausgang rennen].

It is of interest to note that similar ATB violations are grammatical in English, as illustrated by the examples in (38):

(38)a. [This advice]$_i$ the committee [$_{I'}$ decided to follow t_i], and
[$_{I'}$ proceeded to set up a new subcommittee].

b. [The bag holding his savings]$_i$ he [$_{I'}$ dropped t_i without a second thought], and
[$_{I'}$ ran for the exit].

Whether in SLF-coordinations or in simple VP-coordinations, ATB violations of this nature appear to be most acceptable when the actions referred to in the two conjuncts can be interpreted as occurring

[12] Höhle 1983 discusses examples of SLF-coordination in which the initial XP is an adverbial adjunct and shows that the possibility of an interpretation in which the adverbial has scope over both conjuncts should not be attributed to the presence of a trace in the second conjunct (pp. 25–30).

in sequence. The preference for a sequential interpretation may be one reason why SLF-coordination is more natural in conjunctions than in disjunctions, although it is possible in the latter.

As mentioned in footnote 2, many speakers of Dutch find SLF-coordinations marginal when the initial Spec(CP) is occupied by an argument, rather than an adjunct. This restrictiveness is independent of SLF-coordination as such; rather it derives from the fact that Dutch speakers generally accept a narrower range of ATB violations than German speakers do. Thus, speakers who find the SLF-coordinations in (39) less acceptable than examples where the initial Spec(CP) position is occupied by an adjunct (*e.g.* (9) above) also find the examples in (40) marginal. The latter are of course not SLF-coordinations but VP-coordinations parallel to the German examples in (37):

(39)a. ??Dit voorstel heeft de commissie gevolgd en
this suggestion has the committee followed and
heeft een nieuwe subcommissie gevormd.
has a new subcommittee set up
The committee has followed this suggestion and has set up a new sub-committee.

b. ??De baggage liet hij vallen en
the baggage let he fall and
rende naar de achteruitgang.
ran to the rear-exit
He dropped the baggage and ran to the rear exit.

(40)a ??Dit voorstel wil de commissie [$_{VP}$ volgen] en
this suggestion wants the committee follow and
[$_{VP}$ een nieuwe subcommissie vormen].
a new subcommittee set-up
The committee wants to follow this suggestion and set up a new subcommittee.

b. ??De baggage moet je [$_{VP}$ meteen laten vallen] en
the baggage must you immediately let fall and
[$_{VP}$ naar de uitgang rennen].
to the exit run
You should immediately drop the baggage and run to the exit.

Finally, note that in English, in contrast to German and Dutch, it is possible for both the topic XP and the subject of the IP to be shared. Compare (41) with the German example in (42), which is ungrammatical unless the second conjunct contains an overt subject:

(41) These books$_i$ he [$_{I'}$ bought t_i last year], and
[$_{I'}$ now intends to give t_i to his aunt].

(42) Die Briefmarken$_i$ [$_{C'}$ zeigt [$_{IP}$ Karl dem Onkel t_i]] und
the(ACC) stamps shows the(DAT) uncle and
[$_{C'}$ bietet [$_{IP}$ *(er) ihm t_i zum Verkauf an]]
offers he him to-the sale Prt
Intended reading: *The stamps$_i$, Karl shows t_i to his uncle and offers t_i to him for sale.*

This contrast follows straightforwardly from our account. Because in German and Dutch, but not English, topicalization involves obligatory verb movement to C^0, the topic and the subject of IP can only be shared if the intervening verb is shared too, as they are in (43):

(43) Diese Bücher$_i$ hat er [$_{VP}$ t_i gekauft] und
these books has he bought and
[$_{VP}$ seiner Tante t_i geschenkt].
his aunt given.
These books he has bought and given to his aunt.

Clearly, this is not the case in (42) when the subject is missing: both the topic and the subject of IP must be shared by both conjuncts, but the tensed verb intervening between them is not; hence the example is ungrammatical.

5 Further consequences of the relational perspective

Our account of the effect of head-movement on licensing relations leads to explanations for a number of phenomena besides coordination. In this section we will outline some of the advantageous consequences of our proposal.

5.1 Subject questions in English

Our analysis provides a simple account of the exceptional status of subject questions in English that is close to the analysis proposed in Haider 1987, 1988. The problem posed by subject questions in English is that while non-subject questions require the presence of an auxiliary, subject questions do not:

(44)a. *Who elected they?
b. Who did they elect?
c. Who voted?
d. *Who did vote? [unstressed *did*]

The ungrammaticality of (44a) is generally explained as follows. *Wh*-questions in English require not only that the *wh*-word appear in Spec(CP) but also that I^0 move to C^0. Since non-auxiliary verbs in English cannot move to I^0, movement of I^0 to C^0 leaves the verb in the VP. But now that I^0 has moved to C^0, it is no longer adjacent to the verb, and so the process whereby Tense and Agreement lower onto the verb (or the equivalent of this process) cannot take place, and so the sentence is ruled out.

Under standard assumptions, this account leaves the grammaticality of (44c) and ungrammaticality of (44d) unexplained. If the subject moves to Spec(CP) and I^0 moves to C^0, then I^0 will still be separated from the verb by the IP, and by the trace of the subject in Spec(IP). Under our assumptions, however, movement of the subject to Spec(CP) and of I^0 to C^0 results in a configuration where all the licensing relations that these elements enter into are satisfied in their final positions. Consequently, there are no traces left in IP, which is therefore not present at LF. The result is that the relation between I^0 and the verb in a subject question is exactly the same as that between I^0 and the verb in a declarative, and the lowering of tense and agreement onto the verb takes place in the same way in both cases. Thus the representations of (44b) and (44c) are as in (45) (ignoring the representation of the affixing of Tense and Agreement to the verb and the possibility that there is a trace of the subject internal to the VP):

(45)a. [$_{CP}$ Who$_i$ [$_{C'}$ did$_j$ [$_{IP}$ they [$_{I'}$ t_j [$_{VP}$ elect t_i]]]]]?
b. [$_{CP/IP}$ Who$_i$ [$_{C'/I'}$ I^0[+Tense] [$_{VP}$ voted]]]?

Note that adverbs that can occur between the subject and I^0 in declaratives can also occur before the tensed verb in subject questions:

(46)a. They never will keep quiet.
b. Who never will keep quiet?

In object or adjunct questions, on the other hand, such adverbs cannot appear before the tensed verb. Example (47) is at best marginal, and contrasts clearly with (46b): in order to get any reading at all, the interpretation has to be that of inversion triggered by a negative adverb, with the *wh*-word in some kind of dislocated position:

(47) ??Who never will your mother speak to?

This contrast is exactly as we would expect: whatever relation with I^0 or I' licenses the adverb between the subject and I^0 in the declarative, this relation will hold at the CP level when both the subject and I^0 move up. If only I^0 moves up, the IP projection will remain as a separate structure below CP and we will expect the adverb to appear lower down, as in (48):

(48) $[_{CP}$ Who$_i$ $[_{C'}$ will$_j$ $[_{IP}$ your mother never $[_{I'}$ t_j $[_{VP}$ speak to t_i]]]]]?

Of course, this sentence is ambiguous as to the attachment of 'never', since the adverb could also be attached to the right of the trace of I^0.

As mentioned above, our analysis of subject questions is very close to that of Haider. Haider's analysis rests on two premises (Haider 1988, p. 101):

A. Projections do not involve empty heads.

B. Derivations must not be empty, i.e. string vacuous.

Questioning the subject in a matrix question in English would seem necessarily to violate one or other of these two principles. If the subject and tensed verb do not move, then CP will have an empty head position; if the subject and tensed verb do move, this movement will be vacuous, since in English both IP and CP have their heads and their specifiers on the left. Haider proposes, however, that under these circumstances the projections of functional categories may collapse with other projections if their tree geometry matches and there are no clashes in the feature values of the matching nodes (Haider 1988, p. 112):

> A *matching projection* is a projection superimposed on an existing projection such that the nodes of the primary projection serve as secondary nodes of the superimposed projection.

In an English subject question the IP and CP projections match, and so may be superimposed, resulting in a representation like (49b) for (49a) [Haider's (37a,b)]:

(49)a. Who will believe that?
b. $[_{CP\backslash IP}$ who $[_{C'\backslash I'}$ will $[_{VP}$ believe that]]]?

Thus, Haider's premises and ours lead to the same result for subject questions in English.

The analyses diverge, however, when Infl-final Germanic languages are considered. Note, for example, that a German declarative like (13), repeated here for convenience as (50), would not involve superimposition of matching projections, since the movement of the tensed verb to C^0 is not string-vacuous in German:

(50) $[_{CP}$ Er$_i$ $[_{C'}$ rannte$_j$ $[_{IP}$ t_i $[_{I'}$ $[_{VP}$ zum Ausgang $t_j]$ $t'_j]]]]$
he ran to-the exit
He ran to the exit.

Thus, under Haider's assumptions, the final structure of (50) is approximately as given[13]. In contrast, recall that under our analysis there can be no traces in the Spec(IP) and I^0 positions in a sentence like (13)/(50), so that the final structure is as in (14), repeated here as (51):

(51) $[_{CP/IP}$ Er $[_{C'/I'}$ rannte$_j$ $[_{VP}$ zum Ausgang t_j]]]

It is precisely the "telescoping" of the CP and IP projection in examples like (13)/(50) that allows the I/C projection to coordinate with another I projection in an SLF-coordination like (1b), repeated here as (52):

(52) $[_{CP}$ Das Gepäck$_l$ $[_{C'}$ ließ$_j$ $[_{IP}$ er$_i$ $[_{I'}$ t_l fallen t_j] und
$[_{C'/I'}$ rannte$_k$ $[_{VP}$ zum Ausgang t_k]]]

Consequently, Haider's analysis does not extend to an account of SLF-coordination in Infl-final languages.

5.2 A consistent analysis of verb movement

In order to account for the special properties of subject-initial matrix clauses in German, Dutch, and Yiddish, Travis 1984 argues that these clauses are IPs, with the subject occurring in Spec(IP); non-subject-initial clauses, in contrast, are CPs, with the initial XP in Spec(CP). The particular property forming the empirical basis for this proposal is the distribution of weak pronouns. As Travis points out, in these languages a weak pronoun can only appear in the initial position of a clause if it is the subject of that clause; this is accounted for in her analysis by restricting such pronouns to positions within IP.

In this section we will show that our account retains the explanation for the distribution of weak pronouns in the modern V2 languages, while allowing a more straightforward account of verb movement. Further, we will argue that our account, unlike that of Travis, extends to Old English.

5.2.1 The modern V2 languages

It should be clear that we are able to capture the facts discussed by Travis concerning the distribution of weak pronouns in the modern V2 languages, since under our account a nominative pronoun in Spec(CP) and the agreeing verbal complex in C^0 necessarily stand in the same relation to each other as they do when no movement has taken place, since this is a case in which all the licensing relations in which they participate are satisfied in their LF positions, so that there is no trace in I^0, or in Spec(IP). Hence, whatever licenses the occurrence of a weak pronoun in Spec(IP) will license it equally when the pronoun and the verbal complex are in Spec(CP) and C^0 respectively[14].

[13] Haider actually assumes a somewhat different articulation of the verbal projection (Haider 1988, pp. 117f). For ease of comparison, we have ignored this difference, as the point at issue here is not affected.

[14] Note that here again our analysis and one along the lines of Haider 1987, 1988 diverge. Under Haider's assumptions there is telescoping of matching projections only in that subset of subject initial CPs where the movement of the verb to C^0 would be string vacuous. Thus, while the grammaticality of an example like (ia) would be expected, as it would have a structure along the lines of (ib), the equal grammaticality of (iia) would not, as under Haider's assumptions it would have a structure like (iib):

(i) a. Es stimmt.
it is-right

(ii)a. Es würde mich freuen.
it would me delight.

The conceptual advantage of our account, according to which matrix clauses in German always involve movement of the verb to I^0, and subsequently to C^0, is that we are able to maintain the view that in German I^0 selects a complement to the left, and that in subordinate clauses the verb moves out of the VP, just as it does in matrix clauses; only subsequent movement to C^0 is blocked by the presence of an overt complementizer. This is an attractive result, since if it is proposed that I^0 selects a VP to its right, as done by Travis 1984, 1991, Zwart 1991a, 1991b, it is necessary to allow—and in fact require—the verb to remain within the VP in a subordinate clause in order to account for its clause-final position[15]. In order to allow I^0 to remain empty at S-Structure it must be stipulated that in German—in contrast to the Romance languages—C^0 is a proper governor for I^0. Even if this is done, it significantly weakens the correlation that has been established between obligatory raising to I^0 and rich agreement, since German has an even more developed agreement system than, for example, French, one of the languages in which raising of the verb to I^0 in tensed clauses is obligatory (Pollock 1989)[16].

One piece of empirical support for our account over that of Travis comes from CP-coordinations in Dutch and German. Since under our analysis a subject-initial matrix clause is simultaneously a CP and an IP, the fact that it can coordinate with another CP is expected. Such coordinations are, of course, possible in both German and Dutch. (53) is a German example:

(53) Hans fährt jeden Tag um 8 Uhr morgens weg und
Hans goes each day at o'clock morning away and
normalerweise ist er um 8 Uhr abends wieder zu Hause.
normally is he at o'clock evening again at home
Hans leaves every day at 8 in the morning, and
usually he is back home again at 8 in the evening.

The grammaticality of (53) is also consistent with an analysis under which subject-initial clauses are structurally ambiguous, since one of the structures available is a CP (see discussion in Section 5.3). However, the coordination of a subject-initial and a non-subject-initial clause is equally acceptable when the subject is a weak pronoun, as in (54):

(54) Es ist kalt draußen, und
it is cold outside, and
normalerweise würde ich deshalb zu Hause bleiben.
normally would I therefore at home stay
It's cold outside, and so normally I would stay at home.

In the analysis of Travis 1984 and Zwart 1991b a weak pronoun can only occur in Spec(IP). Consequently, the coordination in (54) must involve the coordination of an IP with a CP. But if it is possible to coordinate an IP with a CP, it is surprising that the coordination of an I′ with a C′ is impossible (as we showed in Section 2 above).

That's right.
b. $[_{CP\backslash IP}$ Es $[_{C'\backslash I'}$ stimmt]].

I would be delighted.
b. $[_{CP}$ Es$_i$ $[_{C'}$ würde$_j$ $[_{IP}$ t_i $[_{VP}$ mich freuen $t_j]$ $t'_j]]]$

[15]Zwart 1992 combines Travis's analysis of subject-initial clauses with a recent proposal of Richard Kayne's to the effect that SOV languages are are underlyingly SVO. This position alters the character of the stipulations necessary to preserve the asymmetry between main and subordinate clauses but does not remove the need for such stipulations.

[16]For further arguments against the proposal that matrix clauses in German and Dutch can be either IPs or CPs, see Schwartz and Vikner 1990, Schwartz and Tomaselli 1991, and Vikner and Schwartz 1991.

5.2.2 Old English

Further empirical support for our account can be found in data from Old English, as described in van Kemenade 1987, 1992, and Pintzuk 1991. Old English, a V2 language, exhibits an interesting word order contrast between ordinary affirmative declarative matrix clauses, on the one hand, and matrix questions or negative sentences on the other. The difference between the two types of clause lies in the placement of subject clitics in sentences with non-subject topics. In affirmative declaratives, the subject clitic appears before the tensed verb, producing superficial verb third word order, while in negative sentences and questions the clitic subject appears in the expected post-verbal position. The contrast is illustrated in (55) and (56):

(55)a. Ic gehwam wille thaerto taecan.
I everyone will thereto direct
I will direct everyone there. [Pintzuk 1991, Chapter 3, example (99)]

b. Aelc yfel he maeg don.
each evil he can do
He can do every evil. [Pintzuk 1991, Chapter 3, example (100)]

(56)a. Ne furdhon an ban naefde he mid odhrum.
not even one bone not-had he with others
He didn't have even one bone joined to the others. [Kemenade 1992, example (11a)]

b. Hwi sceole we othres mannes niman?
why should we another man's take
Why should we take those of another man? [Pintzuk 1991, Chapter 3, example (111)]

Full noun phrase subjects, in contrast to the clitics, always appear after the finite verb in sentences with non-subject topics, as illustrated in (57) and (58):

(57) Aelc riht sculon gehadode men lufian.
each right should hallowed men love
Monastic men must love every right. [Pintzuk 1991, Chapter 2, example (2)]

(58)a. For thaes wintres cyle nolde se asolcena erian.
for the winter's cold not-wanted the layabout plough
The layabout didn't want to plough because of the cold. [Kemenade 1992, example (7b)]

b. Hwi wolde God swa lytles thinges him forwyrnan?
why would God so little thing him deny
Why should God deny him such a small thing? [Kemenade 1992, example (7a)]

On the basis of this pattern, Pintzuk argues that non-topicalized clitic subjects uniformly precede I^0 (perhaps adjoining to IP). In affirmative declarative clauses, the inflected verb moves only as far as I^0, leaving the clitic subject on its left; but in questions and negative sentences, the verb moves on to C^0, crossing over the clitic subject, which now appears to the right of the verb. In the case of questions this further movement is triggered by the presence of a [+WH] feature in C^0; similarly, in the case of negative sentences we assume that movement is triggered by a [+NEG] feature in C^0 that must be lexically supported[17].

[17] Evidence for the existence of negative complementizers is provided in Progovac 1988, Laka 1990, and Iatridou and Kroch 1992. We propose, following ideas proposed by Laka concerning the licensing of negative polarity items and

Thus, in Old English we have an independent diagnostic for the categorial status of matrix clauses. Since an analysis along the lines of Travis and Zwart attributes the asymmetries between subject-initial clauses and non-subject initial clauses to a difference in the categorial status of the clause, such an analysis predicts that no such asymmetry will hold in the case of subject-initial and non-subject initial negative CPs in Old English. However, it turns out to be the case that unstressed subject pronouns can occupy Spec(CP) in matrix negative sentences in Old English, as illustrated in (59):

(59) Hi ne dorstan nan gefeoht healdan widh Willelm cynge
they not dared no fight hold with William king
They didn't dare to have a fight with King William.
[Anglo-Saxon Chronicle. A.D. 1075, Peterborough manuscript]

This is, of course, expected under our analysis, since for us the crucial difference is between CPs in which all the functions of the lower functional projections are carried out by the verbal complex in C^0—as happens when the nominative subject is in Spec(CP)—and CPs in which the verbal complex is forced to leave a trace in a lower functional projection.

5.3 Non-ambiguity of matrix clauses

We have just argued that our proposal allows us to capture the difference in behavior of subject-initial and non-subject-initial matrix clauses in a way that is conceptually more attractive than the alternative of maintaining that the former are IPs and the latter CPs. In this section we will argue that Dutch provides data that also supports our analysis.

Under our proposal, there is no empty category following the verb in the second conjunct of an SLF-coordination; rather, the second conjunct "shares" the nominative subject of the first IP. As pointed out by Zwart 1991b, this part of the analysis receives strong support from a peculiarity of verb agreement in Dutch.

In Dutch, a verb agreeing with a second person pronoun has two different forms: one appears when the verb precedes the pronoun, *i.e.* when the verb is in C^0 and the pronoun in Spec(IP); the other appears when the pronoun precedes the verb[18]:

(60)a. Daar ga/*gaat je.
there go go you
There you go.

subjunctive mood, that the [+NEG] feature that occurs in C^0 in Old English licenses the occurrence of the sentential negative marker *ne* that heads a NegP and takes TP as its complement (in the terms of Zanuttini 1991 it is the head of NegP-1). In a matrix clause the verb picks up *ne* as it moves to C^0 to lexicalize the [+NEG] features that are generated there; in a subordinate clause a complementizer can lexicalize the [+NEG] feature and *ne* remains in its base-generated position. The possibility of lexicalizing the [+NEG] feature in C^0 either by verb movement or by the generation of an overt complementizer is exactly parallel to assumptions made about the [+Finite] feature held to be responsible for nominative case-assignment (Platzack and Holmberg 1989, Santorini 1992).

[18]The form *ga* appears only if it is the second person form and is immediately followed by a second person subject. The unstressed form of the second person pronoun—*je*—is the same in both nominative and accusative case. When it occurs as an object it may immediately follow *gaat*, and in fact the form *ga* is unacceptable:

(i) Hij gaat/*ga je opeten
he goes goes you eat
He is going to eat you.

This shows that the form *ga* is not simply the result of a superficial morpho-phonological process changing *gaat* to *ga* just in case it is immediately followed by the forms *je/jij* (Hotze Rullmann, personal communication).

b. Je gaat/*ga
you go go
You go.

In the type of coordination we are considering, the form of the verb that is required in the second conjunct is the form associated with a *preceding* second person subject. The following example is Zwart's (7):

(61) Als je niet verder kunt, dan keer je je om en
if you not further can then turn you yourself around and
gaat/*ga dezelfde weg terug
go go the-same way back
If you can't go further, then turn round and go back the way you came.

We consider this strong confirmation of the uninverted structure of the second conjunct.

As Höhle 1983 points out, SLF-coordination is possible also in questions. (62) is an example from German; its literal equivalent in Dutch is also fully grammatical[19]:

(62) ... oder ist sie einsam und
or is she lonely and
will es nur nicht zugeben?
wants it only not admit
... *or is she$_i$ lonely and [she$_i$] just doesn't want to admit it?*

It follows from our analysis (as also from Zwart's) that there is no inversion in the second conjunct: crucially, there cannot be a subject within the IP as there is in the first conjunct.

Since yes/no questions in German and Dutch standardly require inversion, it might seem a drawback of our analysis that it holds that the second conjunct in examples like (62) is not inverted: that is to say, it has just the same structure as the second conjunct in a coordination of declarative I′s. However, the empirical evidence supports our analysis.

First, if an overt subject is supplied for the second conjunct, it may appear in CP-initial position, as illustrated in (63) for German (the equivalent sentence in Dutch is also grammatical):

(63) ... oder ist sie einsam und sie will es nur nicht zugeben?
or is she lonely and she wants it only not admit
... *or is she lonely and she just doesn't want to admit it?*

The grammaticality of (63) shows that it is possible to conjoin a CP that exhibits the inverted order typical of yes/no questions with an uninverted CP.

Second, the special second person agreement forms of Dutch confirm that in SLF-questions the second conjunct must be uninverted, as predicted by our analysis. The only possible agreement form in the second conjunct is that found in uninverted clauses:

(64) ... of ben je verdrietig en
or are you unhappy and
bent/ *ben liever alleen
are are rather alone
... *or are you unhappy and would rather be alone?*

[19] We owe this example to Jack Hoeksema.

Zwart proposes, as we do here, that SLF-coordination involves an initial I′ conjunct. He argues that this supports Travis's analysis of subject-initial matrix clauses as IPs, since only if the second conjunct is an projection of I^0 should it be able to coordinate with another such projection. However, he points out that subject-initial clauses in Dutch can also coordinate with unequivocal C′s. The crucial example that shows this was given as (10). It is repeated here as (65):

(65) ?Die trein$_i$ [$_{C'}$ is [$_{IP}$ t_i veel te vroeg vertrokken]], maar
that train is far too early left but
[$_{C'}$ had [$_{IP}$ ik anders t_i makkelijk kunnen halen]].
had I otherwise easily can catch
That train$_i$ left far too early, but otherwise I could have caught [it$_i$] easily.

Consequently, he argues that subject-initial matrix clauses in Dutch are ambiguous: they may be either IPs or CPs. Under our account, of course, subject-initial clauses have only one possible structure. Since all the licensing relations entered into by the subject and the verbal complex in C^0 are satisfied in their final positions, no traces are left in IP Instead the CP acquires all the properties of these lower projections.

Since under Zwart's analysis subject-initial clauses are structurally ambiguous, the sentence in (66) could have either of the structures in (67) (irrelevant details omitted):

(66) Jij gaat/*ga.
You go go
You go.

(67)a. [$_{CP}$ Jij$_i$ [$_{C'}$ gaat$_j$ [$_{IP}$ t_i t_j]]].
b. [$_{IP}$ Jij [$_{I'}$ gaat]].

The problem that this poses is that in the structure in (67a) the verb stands in the same relation to the trace of the pronoun as it does to the pronoun itself in an inverted sentence like (60a); unless some version of our proposal concerning the deletion of superseded traces is adopted, we would expect that the type of agreement found in (60a) should be possible here too, which it is not (Christer Platzack, personal communication).

5.4 Constraints on the topic position in Yiddish

It has been shown that in Yiddish clause-initial non-subjects may occupy the specifier position of a functional head lower than C^0 (Diesing 1988, 1990, Santorini 1989, Cardinaletti and Roberts 1991) in all types of subordinate clauses, including those from which some other constituent has been extracted[20]. However, if the verb moves on to C^0—as it does in complementizerless embedded clauses from which long-distance extraction has taken place—the specifier of this functional head can only be occupied by the nominative subject. Thus we find the contrast in (68). In the embedded clause in (68a), Spec(TP) is occupied by the subject, and the sentence is acceptable; in (68b) the embedded Spec(TP) is occupied by an internal argument, and the sentence is ungrammatical:

(68) a. Vemen$_i$ hot er nit gevolt
who(DAT) has he not wanted
[$_{CP}$ t_i [$_{C'}$ zoln$_k$ [$_{TP}$ **mir**$_j$ t'_k [$_{AgrP}$ t_j t_k gebn t_i ot di bikher]]]]?
should we give *prt* the books

[20] The authors cited differ as to the exact identity of the relevant functional head—we shall assume here that it is T^0.

To whom didn't he want us to give these *books?*

b. *Vemen$_i$ hot er nit gevolt
who(DAT) has he not wanted
[$_{CP}$ t_i [$_{C'}$ zoln$_k$ [$_{TP}$ **ot di bikher**$_j$ t'_k [$_{AgrP}$ mir t_k gebn t_i t_j]]]]?
should *prt* the books we give
Intended reading: as (68a)

Note that the ungrammaticality of (68b) is not caused by the extraction of the initial *wh*-phrase out of a non-subject-initial TP, since (69) [from Diesing 1990, her (30)] is acceptable[21]:

(69) Vemen$_i$ hot er nit gevolt
who(DAT) has he not wanted
[$_{CP}$ t_i [$_{C'}$ az [$_{TP}$ **ot di bikher**$_j$ zoln$_k$ [$_{AgrP}$ mir t_k gebn t_i t_j]]]]?
that *prt* the books should we give
To whom did he not want us to give these *books?*

The crucial difference between the ungrammatical (68b) and the grammatical (69) is that in the former the verbal complex has moved into C^0.

Heycock and Santorini 1992 argue that the ungrammaticality of examples like (68b) can be explained if non-thematic positions like the specifiers of functional projections can only be licensed at S-Structure by the heads of chains, but not by traces. Spec(TP) can be licensed by predication or by nominative case-assignment. If the verb moves to C^0, then it cannot license this position by predication (instead, this relation will license Spec(CP)). It may still, however, license the position by nominative case-assignment under government from C^0. Hence, subjects are licensed to appear in Spec(TP) but non-subjects are not.

We are now able to strengthen Heycock and Santorini's result. Since licensing relations that can be satisfied by the heads of chains cannot license the positions of traces, it follows directly that the relation of predication that licenses Spec(TP) when the verb remains in T^0 (as in (69)) is instead satisfied by the relation between the verb in C^0 and the trace occupying Spec(CP) in an example like (68b). Consequently, the relation of predication is not available to license Spec(TP). Thus the structure of (68a) is as in (70):

(70) Vemen$_i$ hot er nit gevolt
who(DAT) has he not wanted
[$_{CP/TP}$ t_i [$_{C'/T'}$ zoln$_k$ [$_{AgrP}$ **mir** t_k gebn t_i ot di bikher]]]?
should we give *prt* the books
To whom didn't he want us to give these *books?*

The subject noun phrase *mir* is in the right position to receive nominative case, whether this is assigned under government by the verbal complex in C^0/T^0 or by Spec-Head agreement with Agr.

On the other hand, an example like (68b), in which a non-nominative noun phrase occurs in the position immediately after the finite verb, is ruled out because the Spec(TP) position is not licensed, as we have seen, and the non-nominative noun phrase cannot occupy Spec(AgrP), as this is the position to which nominative case is assigned.

Old English is similar to Yiddish in allowing non-nominative XPs to occur in the specifier position of a functional head lower than C^0—again, let us assume that this head is T^0. As discussed in Section 5.2, the placement of subject clitics shows that in matrix questions and negative sentences in this language

[21] For more detailed discussion of this point the reader is referred to Heycock and Santorini 1992.

the verb moves on from T^0 to C^0. Under standard assumptions, we would expect to find matrix questions and negative sentences with Spec(TP) occupied by a non-subject, as schematized in (71):

(71) $[_{CP}\ XP^1\ [_{C'}\ V\ [_{TP}\ XP^2\ [_{T'}\ [_{AgrP}\ Subj\ \ldots$

The view of derivations proposed in this paper, however, predicts that this should not be possible. Just as in the Yiddish case discussed above, if the verb moves on from T^0 to C^0, and an XP occupies Spec(CP), the relation of predication which alone could license Spec(TP) and the trace of the verbal complex in T^0 is no longer available, as it is satisfied by the XP in Spec(CP) and the verbal complex in C^0. Hence TP must collapse with CP, as in (72):

(72) $[_{CP/TP}\ XP\ [_{C'/T'}\ V\ [_{AgrP}\ Subj\ \ldots$

Although non-occurrence in a finite corpus cannot constitute definitive proof of ungrammaticality, it is worth noting that in Pintzuk's corpus of parsed Old English, there are no examples of matrix questions or negatives where an argument or non-sentential adjunct occupies the position between the tensed verb in C^0 and the subject: that is, there are no examples of the configuration in (71) (Susan Pintzuk, personal communication).

6 Conclusion

In this paper we have put forward a simple hypothesis about the way in which syntactic structure is projected from heads: namely, the structure must be the minimum necessary for all licensing relations to be satisfied. We have then shown that this hypothesis provides a resolution to the paradox which arises in the analysis of SLF-coordinations.

We have further shown that this hypothesis allows us to account for the parallel behavior of sentences with and without expletives, as long as relevant constraints are taken to hold at LF rather than at S-Structure, a result consistent with Chomsky's recent proposal to do away with S-Structure well-formedness constraints. In addition to allowing an account of SLF-coordination that is empirically superior to others that have been proposed, we have demonstrated that this way of looking at derivations yields straightforward analyses for other phenomena, including the behavior of subject questions in English, the distribution of unstressed pronouns in German, Dutch, Yiddish, and Old English, and a constraint on the Spec(TP) position in Yiddish and Old English[22].

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[22] A number of interesting avenues remain to be explored in future work. One is the impact of our proposal on the analysis of verb-movement in the Romance languages. Another is the possibility that this view of derivation might elucidate the otherwise puzzling lack of certain ambiguities in scrambling constructions where multiple scrambling results in the recreation at S-Structure of the D-Structure orders.

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