

A Problem in English Subject Complementation

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Introduction

In this paper I present a particular problem for the grammatical description and explanation of subject complementation in English. This problem has so far not found a solution in any of the current theories of grammar, in particular the theory of Government and Binding. I also present a principled solution of this problem, in terms of the theory of Semantic Syntax. The problem, and the essence of its solution, were presented by me in a talk at the MIT Linguistics Department almost twenty years ago. On that occasion, the audience, or at least those who set the tone for the audience, were unwilling to accept the reality of the problem, and thus even less willing to consider the solution proposed. One reason for this negative attitude, I felt at the time, was probably the fact that both the problem and the solution offered were awkward for the theoretical orientation which was then beginning to be developed, in particular X-bar theory. This awkwardness has remained: the problem has so far proved refractory in terms of MIT-based theory, and the solution is at loggerheads with X-bar theory, now as then.

1. The problem

The problem at hand is illustrated by the different grammatical behaviour of the adjective *likely* and the verb *seem*, as can be seen from the following examples:

- (1)a. Tom is likely to be ill.
- b. It is likely that Tom is ill.
- c. That Tom is ill is likely.
- (2)a. I expect Tom to be likely to be ill.
- b. I expect it to be likely that Tom is ill.
- c. * I expect that Tom is ill to be likely.
- d. That Tom is ill I expect to be likely.

- (3)a. Tom is expected to be likely to be ill.
 b. It is expected to be likely that Tom is ill.
 c. That Tom is ill is expected to be likely.
- (4)a. Tom seems to be ill.
 b. It seems that Tom is ill.
 c. * That Tom is ill seems.
- (5)a. I expect Tom to seem to be ill.
 b. I expect it to seem that Tom is ill.
 c. * I expect that Tom is ill to seem.
 d. * That Tom is ill I expect to seem.
- (6)a. Tom is expected to seem to be ill.
 b. It is expected to seem that Tom is ill.
 c. * That Tom is ill is expected to seem.

When we set off the sentences (1)-(3), which have the predicate *likely*, against (4)-(6), which have the predicate *seem*, we notice that the (a) and (b) cases behave similarly, as do (2c) and (5c), but while (1c), (2d), and (3c) are grammatical, the corresponding (4c), (5d), and (6c) are not. The question is: why not? Or more precisely: what can account for the fact that adjectives like *likely* allow for Subject Raising (all (a)-cases), *it*-Placement (IT, as in all (b)-cases), and Subject Clause (SC, as in (1c), (2d), (3c)), except when the subject clause is internal (as in (2c)), while verbs like *seem* allow for Subject Raising and IT, but not for SC?

It will not do to dismiss the problem by saying that these are merely stylistic, and not grammatical, differences (as leading voices said when I presented this problem at MIT in 1970), because "English does not like sentences with subject clauses to end in a verb" in this case *seems*. That this cannot be the answer appears from cases like (7c):

- (7)a. * Tom follows to be ill.
 b. It follows that Tom is ill.
 c. That Tom is ill follows.

Follows is a verb, like *seems*, yet the grammatical status of (7c) is unimpeachable. (7a) however, is clearly ungrammatical, while (7b) is fine. Apparently, there are verbs, like *follow*, which do not take Subject Raising

(SR), but do take IT and SC. Other verbs of this class are *fit*, *hurt*, and the complex verbs *stand to reason*, *make sense*. And we might as well use this opportunity to note that there are also verbs that take SR, but neither IT nor SC, such as *tend*, *start*, *begin*, *continue*, *cease*, and others:

- (8)a. Tom tends to be lucky.
 b. * It tends that Tom is lucky.
 c. * That Tom is lucky tends.

The class of verbs that behave like *seem* includes: *appear*, *turn out*, *happen*, *be believed*, *be expected*, *be thought*, *be rumoured*, and others. The class of adjectives or past participles that behave like *likely* includes: *certain*, *sure*, *said*, *known*, *believed*, *expected*, and a few more. If the reader wonders why and how predicates like *be expected*, *be believed*, can behave both like *seem* and like *likely*, he is asked to wait a little till the verbs *expect* and *believe* are discussed. It will then become clear that these verbs fall into the *seem*-class or the *likely*-class according to their subcategorization for one or another type of complement clause, with semantic differences.

All the predicates (verbs or adjectives) discussed so far have in common that they subcategorize for an embedded subject clause (subject-S), or for an embedded object clause (object-S) turned into subject-S under Passive. We notice, in addition, that whenever a *that*-clause finds itself in sentence-initial position, as in (1c), (2d), (3c), (7c), it has the discourse property of being either topic or comment. We assume that a sentence has a topic-comment modulation when it is uttered as an answer to a (mostly implicit) WH-question: the topic takes up the questioned element, and the comment is the answer. More will be said about this in the following section.

2. The essentials of Semantic Syntax

The theory of Semantic Syntax holds that every natural language sentence has, besides its surface structure, a Semantic Analysis (SA), which contains all relevant semantic information of the sentence, without ambiguity, and in weakly¹ compositional form. SAs are cast in a logical language akin to modern restricted quantification theory. The grammar of the language consists in the

set of rules that define the systematic mapping procedure between an SA and its surface structure (SS). Since both SAs and SSs are linguistic objects, a grammar is essentially a set of transformations, in the established sense of transformations as mappings between sets of linguistic (tree) structures and sets of linguistic (tree) structures. The transformations are, of necessity, semantically invariant, or meaning-preserving. They are required by the fact that SAs, with their deeply layered multiple S-embeddings and their compositional structure, are suitable objects for semantic interpretation, while their corresponding SSs, with their "flat" trees and largely linear order, are more suitable for acoustic transmission. It is not unlikely that the functional requirement of rapid acoustic transmission of semantically complex propositions places certain "autonomous" restrictions on transformations, especially on those nearer the surface. Yet the overall tendency is for the transformational rules to eliminate S-embeddings and "flatten" the trees, while introducing a greater variety of word classes and constituent categories than is found in SAs. The rules seem to be subject to a general, perhaps universal, set of constraints, which will be presented below.

The basic formation rule for SAs is as follows:

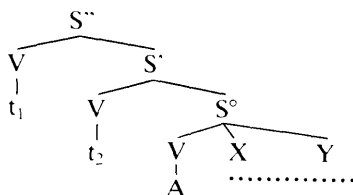
$$(9) \quad S \quad V - \left\{ \begin{matrix} \text{NP} \\ \text{S} \end{matrix} \right\} - (\text{NP}) - \left(\left\{ \begin{matrix} \text{NP} \\ \text{S} \end{matrix} \right\} \right)$$

That is, an S consists of a (semantic) predicate V, followed by one, two, or three arguments. The first argument, which is NP or S, is always the subject. The last argument, in case there is more than one, is again either NP or S, and is the object. When there are three arguments the middle argument, always NP, is the indirect object. All sorts of abstract semantic elements in sentences are analysed on SA-level as (abstract) predicates: quantifiers, tenses, prepositions, sentence adverbials, modalities, coordinating and subordinating conjunctions, etc. The normal procedure for non-lexical abstract predicates is Lowering: they are incorporated in certain, language-dependent, ways into their argument-S, in a mapping from SA to SS. We shall adhere to the common practice of formulating the rules top-down, i.e., from SA-level to SS-level.

Non-abstract, i.e. lexical, semantic predicates end up as verbs, adjectives, or as nouns, adverbs or prepositions. Verbs, adjectives and nouns can occur as surface predicates. These are characterized by the fact that they allow for tensing: a

verb or adjective in a full clause, i.e. with finite verb, takes two tenses, t_1 and t_2 ; a verb or adjective in an infinitival clause takes either one tense, t_2 , or no tense at all, depending on the subcategorization properties of the higher predicate. The standard tree structure for a full clause in the language of Semantic Analysis is thus:

(10)



Embedded clauses are of the form S'' (i.e. with two tenses), ending up as a full clause with a finite verb form, or S' (i.e. with just one tense, t_2), ending up, normally, as an infinitive with or without the tense auxiliary *have* (which takes over the infinitive form and turns the main verb into a past participle), or S° (i.e. without any tense at all), ending up, normally, as an infinitive, but never with the tense auxiliary *have* + PP (i.e. past participle). It depends on the subcategorization properties of the higher, commanding, verb whether there is an embedded S'' , S' or S° . The difference can be read from the presence of a full embedded clause (usually with complementizer), or the possibility of having *have* + PP for an infinitive. Examples will be given below.

Defining the semantics of t_1 and t_2 in a language is not an easy matter. In most languages the use of one or both of the tenses gives rise to specific presuppositions and possibly other complicating factors. We shall limit ourselves to what is seen as the universal, language-independent, semantics of the two tenses. The highest tense, t_1 , is indexical or anaphoric: it refers either to the indexically given moment of utterance ("PRES"), or to some contextually defined past time ("PAST"), in which sense it can be said to be anaphorical. It can be paraphrased as "at this/that time". The second tense, t_2 , is quantifying and relative. It contains an existential quantification over either events (aorist aspect) or durations (durative aspect), placing them at the same time as t_1 ("SIM") or prior to t_1 ("PREC"). It can be paraphrased as, roughly, "there is/was an event/duration simultaneous with/prior to that time". Typically, PRES

+ SIM gives a simple present tense, PAST + SIM gives a simple past, PRES + PREC gives a present perfect, and PAST + PREC gives a pluperfect.

Accordingly, the morphological realization of PRES and PAST consists in the tense marking for the finite verb form (present or past tense, respectively). The morphological realization of SIM is zero, whereas that of PREC is *have* + PP in practically all cases (very occasionally English allows for *be* + PP, as in: *It is gone*, or in archaic uses like: *The gods are departed*).

In the transformational cycle, both tenses are lowered (L) onto the leftmost lower V. The highest tense, t_1 , moreover, induces SR (Subject Raising). As the details of these processes are given, it will become clear that this assignment of rules to the tenses automatically accounts for the change of the VSO-pattern into the standard NP-VP (or SVO) pattern of English surface structures. Languages with surface VSO-pattern differ from the NP-VP languages only in that t_1 does not induce SR.

Before we can go into the transformational rule system, however, a few things must be said about constraints on trees, whether on SA-level or on SS-level or on any level in between. First, and this is central to the solution proposed here for the problem described in section 1, an embedded S can also be an NP, depending on the subcategorization properties of the embedding predicate. In the SA-tree there will then be an NP over S. The number of tenses is irrelevant: S may be an S", an S', or an S°. It should be noted that X-bar theory excludes, as a matter of principle, any configuration NP-over-S. In that theory, trees are structured as expansions of major categories: an NP is an N-expansion, and an S is a V-expansion. Mixture of the two is excluded on principle. We do not accept, however, X-bar theory, and we are thus free to use the NP-over-S configuration as an explanatory principle.

A further requirement is the following. When the cycle reaches S", then the subject of S', its argument-S, must be an NP (whether nominal or sentential), and not just an S. The reason for this is easy to see: t_1 , the (abstract) predicate of S", induces the rule of S(ubject) R(aising), which, as we shall see, operates only on NP-subjects. This constraint thus applies neither at SA-level nor at SS-level, but in between, at the level where the S"-cycle starts to work. Given that no further rule will destroy the NP-status of the subject, it follows that in SS, too, the subject will always be an NP (nominal or sentential).

Then there are constraints to do with the topic-comment modulation often found in sentences in discourse. As is well-known, there is a great deal of unclarity in the literature about questions of topic, comment, focus, theme, and related notions. We limit ourselves to the pair "topic-comment", and, as was said at the end of section 1, we assume that in living discourse a new utterance is often intended as an answer to a question, usually not explicitly phrased, that has arisen or that the speaker expects will arise in the listener's mind. The part of the utterance that reflects the question will then remain unaccented, whereas the remainder, i.e. the answer to the (implicit) question, will be assigned a salient accentual structure. This structural division we call "topic-comment modulation". It is sometimes connected with the grammar of the language in question, in that certain structural positions are mandatory, or forbidden, for topics, or comments. Take the sentence:

(11) That we could not win the war was obvious from the start.

The most normal intonation will have accent on the predicate part "obvious from the start". Under this intonation the *that*-clause is topic. But the sentence can also be read with accent on the *that*-clause, in which case that clause is comment, as when the sentence answers the (implicit) question "What was obvious from the start?". In any case, the *that*-clause has to be either clearly topic or clearly comment: a neutral reading is not possible, unlike:

(12) It was obvious from the start that we could not win this war.

which does allow for a reading that remains neutral as to topic or comment.

It seems useful to stipulate that only NPs can be [+top]. Furthermore, it seems that *that*-clauses which are [+top] have to be in sentence-initial position, whereas comment *that*-clauses may, but do not have to be, in sentence-initial position. It may well be that the same constraint holds for embedded infinitivals, as in:

(13) Tame that horse is what I saw him do.
But this question is not relevant to this paper.

Now to the transformational system, most of which may be considered common knowledge, especially the transformational cycle. What does need comment here are the constraints on the cyclic rules that operate on SAs. Semantic Syntax has always been hesitant to come forward with precise proposals in this regard, mainly to avoid the risk of premature statements, which will then be subject to constant public revision. Rather than indulge in this practice, as was done in at least one school of thought, it seems wiser to hold back a little and keep the inevitable process of testing and reformulating confined to one's study and one's classes until some reasonable degree of consolidation has been reached. It now looks as if that moment has indeed come: we can now formulate some significant and generally applicable constraints on the transformational mapping system from SAs onto SSs with a sufficient degree of confidence. It must be noted that the constraints proposed for rules of grammar in other schools do not apply to the SA-SS mapping system, but have been presented in the framework of "autonomous" syntax, where semantically relevant mappings play no part. Although it is usually accepted, in those circles, that an SA-SS mapping system must be taken to be part of the description of a language, no attempts seem ever to have been made to formulate constraints for this mapping system, all the effort in this regard being directed towards what is seen as the autonomous rules of syntax. It hardly needs to be argued that such a limitation cannot be justified: whatever arguments hold for there being constraints in autonomous syntax must also hold for there being constraints in SA-SS mapping systems.

We thus formulate the following general (possibly universal) properties of the cyclic rules of transformational syntax. (The properties listed below do not form the complete set of constraints needed for an adequate theory of Semantic Syntax. Yet they cover more ground than is strictly necessary for the question at hand.)

I. Lexical and structural rule induction

Most cyclic T(transformational)-rules are induced by the V on the appropriate S-cycle. Each V is specified in the lexicon for the cyclic T-rules it induces. Lexical rule specifications are placed between angled brackets. Round brackets indicate that the rule is optional.

Other T-rules are induced, obligatorily or optionally, by specific tree-structure configurations. A case in point is *it*-insertion (IT), as given below.

II. Raising

A lexical rule, induced by a higher V, may raise a lower V or NP. When V is raised it attaches itself to (the left or right of) the next higher V (Predicate Raising or PR). Only subject-NPs can be raised (Subject Raising or SR). When a subject-NP is raised, it occupies the place of its own S, the remainder of which shifts one position to the right. An NP can be raised only if its own S is not NP, and is S'.

III. Lowering

A lexical rule, induced by V on some cycle, may lower that V into an argument-S. NP-Lowering does not occur in the cycle. When a V is lowered it usually changes category: it becomes a preposition, adverb, particle, affix, etc. Abstract predicates, such as in particular logical operators and tenses, are all lowered. Quantifiers are lowered onto their variables. Tenses are lowered onto the lower V. Other landing sites for Lowering are language-specific.

IV. Deletion

A lexical rule, induced by V on some cycle C_n , may delete an NP in an argument- S_{n+1} . Only a subject-NP can be deleted (Secondary Subject Deletion, or SSD). The deletion is controlled by an NP-argument in either S_n (vertical SSD), or the subject- S_{n+1} when V of S_n takes both a subject-S and an object-S (horizontal SSD).

V. Effects of Raising, Lowering or Deletion

If an S loses its subject-NP through Raising or Deletion it is demoted to the lower category /S (= VP).

If an S loses its V through Raising then the S-node in question is pruned and all its non-V material is reattached to the next higher S-node, at the right of the material already there.

If an S loses its V through Lowering the S-node stays, unless it is idle (S-over-S without branching).

VI. Specific properties of SVO (= NP-VP) languages

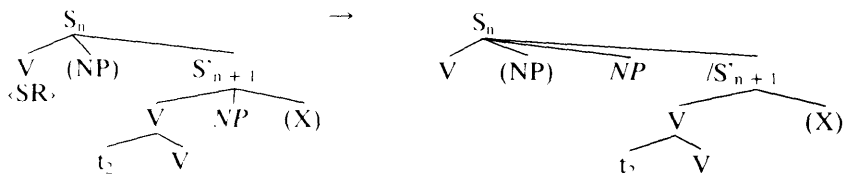
In SVO-languages an S' or an S° always loses either its subject-NP or its V. In SVO-languages, not only are, as elsewhere, the tenses lowered onto the lower V, but, in addition, t_1 induces SR. t_1 thus takes <SR,L>, and t_2 takes <L>.

VII. Specific property of Copula-languages

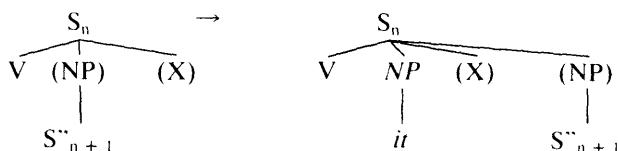
Predicates (Vs in SA) that are lexically categorized as non-verbs (i.e. adjectives, nouns, prepositions) get the copula *be* as verb under tense, i.e. just t_1 or t_1 and t_2 .

What interests us here most directly are the rules of S(ubject) R(aising) and IT. The Deletion rules of (vertical or horizontal) SSD are not directly relevant to the question at hand, yet we shall illustrate how they work. We will, moreover, show how the combination of SR and L(owering) for t_1 automatically brings about the desired NP-VP structure from the VSO-structure found in SA-trees.

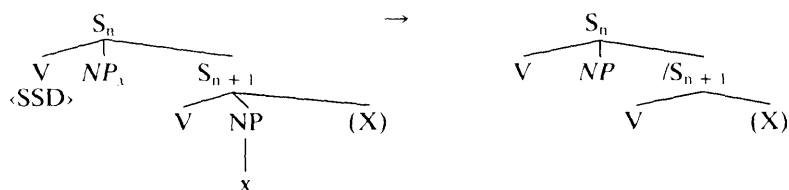
SR:



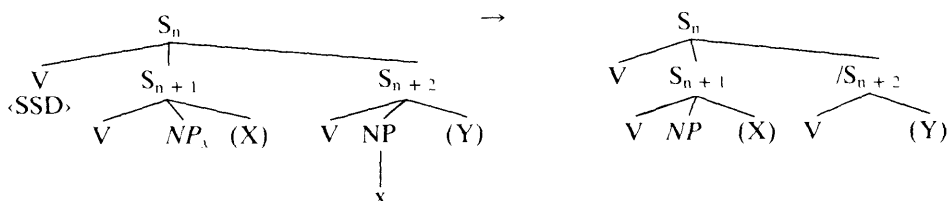
IT: If the subject is S'' or $NP[S'']$ and [-top], insert $NP[it]$ in the position of the subject-S, which is moved to the far right. Obligatory for S'' ; optional for $NP[S'']$.



(Vertical) SSD:



(Horizontal) SSD:



In the specification of SR, the raised subject-NP has been italicized. The bracketed NP may or may not be there. If it is, we have what used to be called "Subject-to-Object Raising": the subject of S'_{n+1} becomes the grammatical object of S_n . If the bracketed NP is absent, then S'_{n+1} is the subject of S_n and we have Subject-to-Subject Raising. (Clearly, the bracketed X stands for any other, irrelevant, material that might be there).

The rule IT requires little comment. It turns, e.g., *surprise - that he failed-John* into *surprise - it - John - that he failed*.

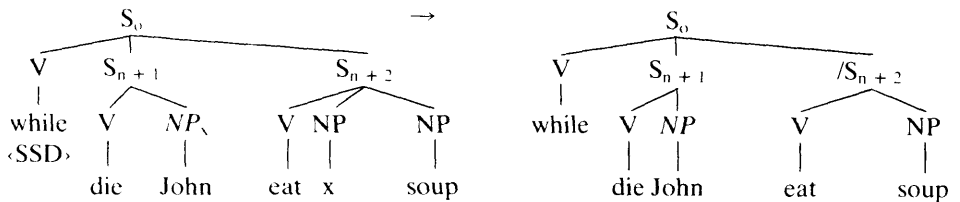
Vertical SSD (traditionally Equi-NP-Deletion) involves one embedded object-clause, whose subject is either codenotational with some controlling NP in the higher clause or bound by the same quantifier (e.g. *Everyone wants to win*). The controlling NP is printed in italics and subscripted with *x* to indicate its coreferential or covariable link with the lower subject. The controlling NP is most often the higher subject, but, as is well-known, it may also be an (indirect) object, depending on the SSD-inducing verb and/or other factors that have so far not been identified with sufficient clarity. As with SR, the embedded clause is degraded to the status of /S (=VP), due to the loss of its subject-NP.

Horizontal SSD is less well-known, owing, mainly, to the fact that it requires a type of syntactic analysis which is abstract to a degree found only in Semantic Syntax and not or hardly in other syntactic theories. It occurs in, e.g.:

(14) John died while eating soup.

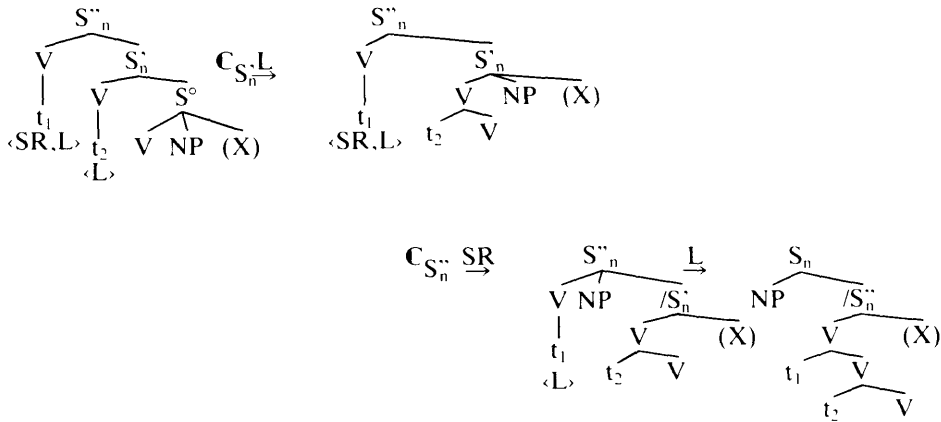
analysed as follows (leaving out tenses as well as other derivational details):

(15)



It is now easily demonstrated that by assigning the rule SR and L(owering) to t_1 , and only L to t_2 , the VSO-structure of SAs is automatically converted into the NP-VP structure required for English surface structures:

(16) Tense Processing



First, on the S'_n -cycle (the symbol "C" is used for cycles), t_2 must be lowered into S^o . Tenses lower onto the lower V, as has been said. "Onto" means that the V-node is copied above itself, and the lowered element is (left)-attached to the copy. This process is called (Left-)Adoption. The S above the lowered t_2 is pruned because it is idle. (The superscript "o" is changed into "" to indicate that the S in question has one tense). Then we pass to the S''_n -cycle. The first rule to be applied is SR (if L applied first, there would be no way to apply SR later). The result is that the subject-NP of S'_n occupies the place of the same S'_n , which is degraded to $/S'_n$ (due to the loss of its subject-NP), and shifts one position to the right. Finally, t_1 must be lowered. This process is entirely analogous to the lowering of t_2 : t_1 is left-adopted by the (complex) V of $/S'_n$.

Note that S''_n is not pruned, because it contains the raised NP besides the embedded $/S'_n$. The result is an S''_n (with two tenses) which has the structure NP- $/S''_n$ or NP-VP. Note also that the difference between VSO-languages and NP-VP (i.e. SVO) languages can now be accounted for simply by stipulating that, in a VSO-language, t_1 does not induce SR but only L: S^o will then incorporate both tenses but will not change its VSO-structure.

It is a striking general feature of this theory as a whole that it has a strong "flattening" effect on SA-structures: the resulting SS-structures show nothing like the degree of S-embedding (which makes for vertically oriented structures) found in SAs. SSs are relatively "flat", and also contain many more different

categories than SAs, which are limited to the categories S, V, NP. Surface structures have, in addition, adverbs, adjectives, prepositions and what not. This change from vertical to horizontal orientation in tree structures is highly functional, since the categorially simple and strongly S-cyclic SA-structures lend themselves naturally to semantic processing, whereas the "flat" SSs lend themselves naturally to the highly linear process of rapid acoustic transmission.

Finally, it must be observed that this restricted system of cyclic transformation is neutral between a top-down processing or a bottom-up processing. The formulation given here is in terms of top-down processing, i.e. from SA to SS, as has been customary in the theory of Transformational Grammar from the beginning. It is easily seen, however, that nothing prevents a bottom-up formulation, as long as the elements in question are marked for the kind of process or rule they induce. What we have called a raised V or NP must then be lowered: a V from a complex V-island, and an NP into the position of subject of the /S that stands to its right. An element that is lowered in our terminology will then be raised to become the V of a new S to be set up above the S in question. A deleted subject-NP is recovered on the basis of the predicate (V) in question and the designated controlling NP. Likewise, all effects as mentioned under V. above are unambiguously reversible. It would seem that the requirement of two-way processing is in itself a strong limiting condition on any theory of syntax.

After these preliminaries we can now proceed to the presentation of the solution to the problem stated in section 1.

3. The solution

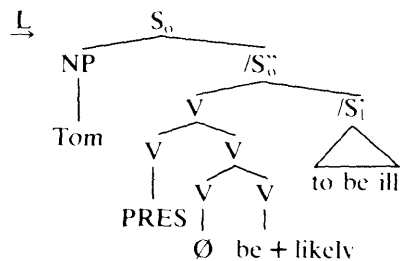
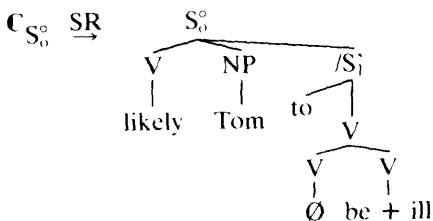
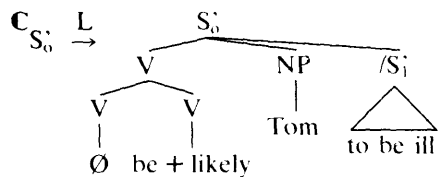
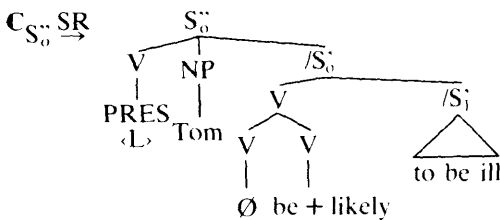
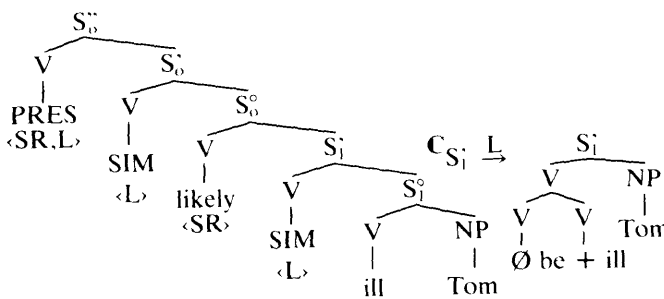
The solution is now relatively simple: it consists in a judicious and factually correct assignment of subcategorization properties and lexically induced rules. Table (17) gives the surface category, the subcategorization, and the rules for the predicates *likely*, *seem*, *tend* and *follow*. All four are **unary** predicates: they take just one argument, in all cases a sentential subject: S' or S", the latter with or without a dominating NP. The only rule assigned is SR, which, as has been said, can apply only when the subject to be raised stands under an S'. The oblique stroke indicates a choice of category:

(17) SS-category subcategorization
(for object-position) rules

expect	verb	NP/S'/S''/NP[S'']	⟨SR⟩
believe	verb	NP/S'/S''/NP[S'']	⟨SR⟩
think	verb	S'/S''	⟨SR⟩

As regards *follow*, it is clear that it can only take a *that*-clause, either in subject position (obligatory if the subject clause is [+top]) or extraposed and with the dummy subject *it*, as was shown in (7) above). *Likely* has more possibilities: apart from those available also to *follow*, *likely* can take, in addition, an S'-subject, in which case SR applies obligatorily. Hence the grammaticality of (1a). The derivation of (1a) is demonstrated in (18):

(18)



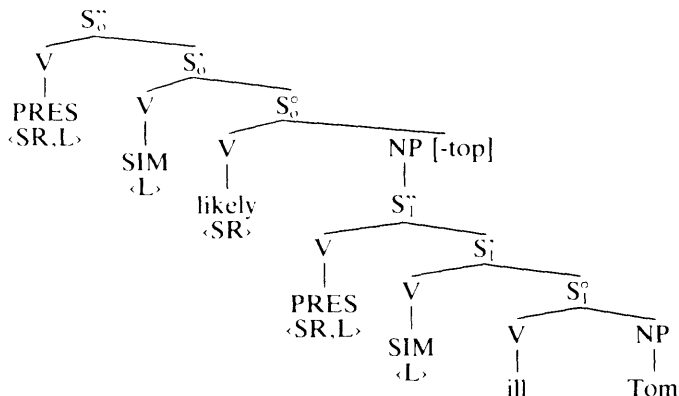
Note that in (18) the embedded $/S'_1$ (i.e. VP) gets the infinitival complementizer *to*. Whether this is inserted during or after the cycle is not clear: it is added here only for the sake of completeness. *To* is a common feature of embedded infinitivals in English: the rule is that it occurs; the exceptions are to be stated. */Ss* embedded after modal auxiliaries (*may, must, can, need, will, etc.*) notably lack this *to*. But also cases like the following:

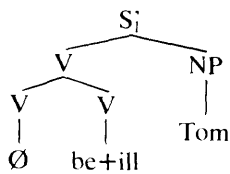
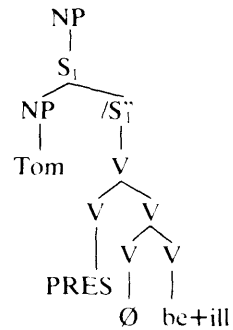
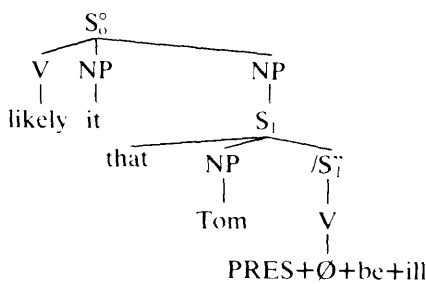
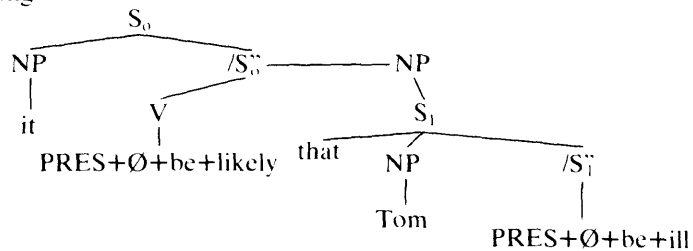
- (19)a. I saw him fall.
 b. That will make him see the truth.
 c. He let the man go.

These are cases where the embedded */S* lacks tense altogether, as appears from the ungrammaticality of these sentences with the infinitive replaced by *have* followed by the past participle of the verb in question: * *I saw him have fallen*, etc. It seems that, in general, tenseless */Ss* are less prone to taking *to*, although here, too, the rule is not absolute: *allow* is followed by a *to*-infinitival without tense. *Help* takes optional *to* in the sense of "assist": *She helped me (to) cut the grass*, but embeds its */S* without *to* in the sense "be instrumental in", as in: *I helped the boat sink*. Clearly, an */S* that incorporates two tenses cannot take *to* because *to* is an infinitival complementizer, and an */S* with two tenses is not infinitival but finite.

Let us now pass on to the derivation of (1b) *It is likely that Tom is ill*:

(20)



$C_{S_i} \xrightarrow{L}$

 $C_{S_i} \xrightarrow{SR, L}$

 $C_{S_o} \xrightarrow{IT}$

 $C_{S_o} \xrightarrow{\text{Tense Processing}}$


Note that if the subject-NP of *likely* had been [+top], then S_1 would not have been extraposed by IT and would have occupied the normal subject position, resulting in (1c). Note also that the rule SR, associated with *likely*, remains idle: it can operate only when the complement-S has just one tense, as has been stipulated.

It is now obvious why (4c) must be ungrammatical: the *that*-clause stands in subject position, which it is allowed to do only if it is NP: tensed clauses require NP-subjects. But *seem* is not subcategorised for an NP-subject clause, even though it may take a subject-S" clause. It follows that when *seem* takes an S" as subject the sentence must undergo IT, as in (4b). It is, moreover, in agreement with what has been said about topic-comment modulations that sentence (4b) does not seem to lend itself easily for a [+top] or even a [+comment] *that*-clause.

The same requirement that fully tensed clauses, i.e. with a finite verb form, require an NP-subject also accounts for the ungrammaticality of (6c) *That Tom is ill is expected to seem*: here, too, the *that*-clause is grammatical subject and must, therefore, be an NP. Its SA-status, however, is that of subject-clause to *seem*, and it can, therefore, not be an NP.

Let us now consider the derivation of (2a) *I expect Tom to be likely to be ill*. For this it is necessary to specify first the subcategorization and rule properties of the verb *expect*. We shall do this together with the specification for *believe* and *think*:

(21)	SS-category	subcategorization	rules
likely	adjective	NP[S'']/S'	⟨SR⟩
seem	verb	S'/S''	⟨SR⟩
tend	verb	S'	⟨SR⟩
follow	verb	NP[S'']	

A few observations are in order here. First, *think* has been assigned the rule of SR, together with the possibility of an S' as object-clause. This is correct only for certain, slightly archaic, varieties of English. Then, more importantly, both *expect* and *believe*, which have identical features, are subcategorized for four object options: NP (as in: *I believe you*), S', S'', and NP[S'']. The interesting point here is that one can detect a semantic difference between an embeded S''-clause that is NP and one that is not. Consider the following two little dialogues:

(22) A: Do you believe that the earth is flat?

B: Yes, I believe *that* (**so*).

(23) A: Do you believe/expect/think that Tom will vote for Jack?

B: Yes, I believe/expect/think *so* (**that*).

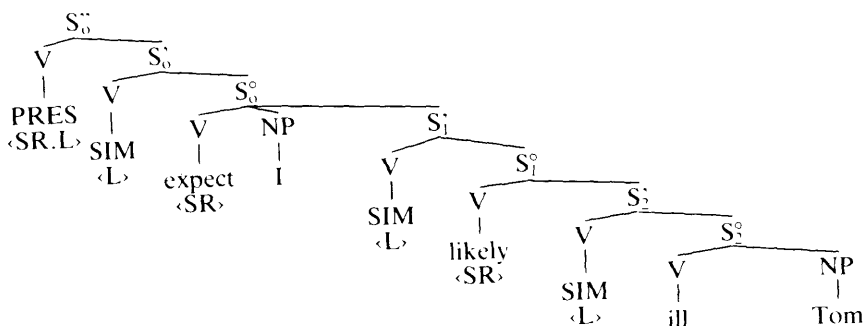
Not only does this show that *so*-pronominalization differs semantically from *that/it*-pronominalization of *that*-clauses, it also suggests that *so* pronominalizes non-NP clauses, whereas *that* or *it* pronominalize *that*-clauses under NP. This suggestion is confirmed by the spread of ungrammaticality in (24) and (25):²

- (24)a. So it seems.
 b. So it is thought/believed/expected.
 c. * So it is likely.
 (25)a. That is likely.
 b. That is believed/expected.
 c. * That seems.
 d. (*) That is thought.³

These observations lend support to the main hypothesis underlying this paper, that embedded Ss are either NP or not NP. X-bar theory is weakened to the extent that this hypothesis is confirmed.

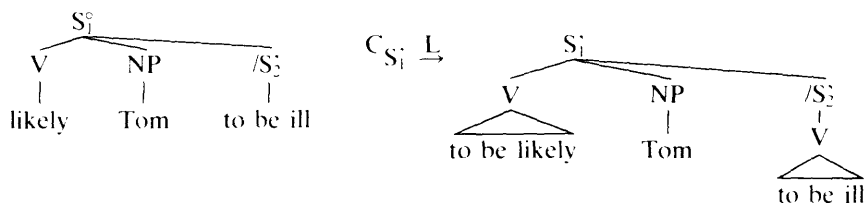
Now back to (2a), whose derivation is as follows:

(26)a.



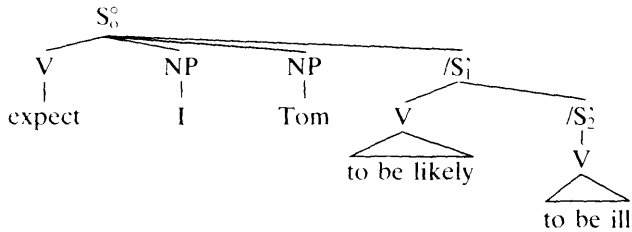
The reader will have little difficulty now to work out the S_2 -cycle, which lowers SIM onto *ill* to give *to be ill*. Then, on the next cycle up, S_1 , SR raises NP[*Tom*] to the position of S_2 , which is demoted to $/S_2$ and shifted one position to the right:

(26)b.



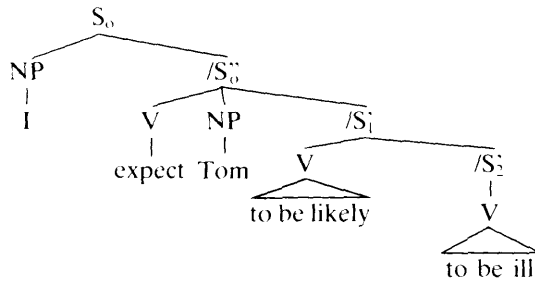
We are now on the S_0° -cycle, where, again, SR has to apply, lifting $NP[Tom]$ up, for the second time, to the position of its own S, this time S'_1 , and shifting $/S'_1$ one position to the right:

(26)c.



Tense Processing will then finally yield:

(26)d.



The analysis as given so far accounts in principle for all the data in (1-8), but for the ungrammaticality of (2c) and the grammaticality of (2d). The case of (2c) does not seem too difficult: it is explained by Ross's "Internal S Constraint" (Ross 1967), according to which a nonrelative embedded S cannot occur internally but must stand either at the beginning or at the end of a sentence. (2c) is in violation of that constraint. We may, however, take (2c) to be an intermediary stage in the generation of (2d), assuming that the *that*-clause has been moved postcyclically to sentence-initial position, being marked [+top]. The bulk of the explanation, however, of the phenomena observed in relation with the problem of English subject complementation lies in the rules of the transformational cycle, not in those of the postcycle.

Notes

*. My friendship with Wim de Geest, whom we honour in this volume, is even older than my solution to this problem of English grammar: our friendship goes back to the mid-60s. In the beginning our acquaintance was purely professional. But Wim's warm and caring personality made it impossible to keep it that way. We soon became solid personal friends. It is to this special friend and esteemed colleague that I dedicate this paper.

1. By "weak compositionality" we mean what is normally meant by "compositionality", i.e. the principle that the semantic effect of a construction is computable as the value of a function F such that one of the constituents is F and the other(s) form(s) the input to F , the value being assigned to the node dominating the construction. The principle is recursive in that the input to F can itself be the value of a compositional construction, - this principle being weakened, however, by possible appeals to background knowledge. That such appeals are sometimes required appears from cases like the following:

- (i) Each room has a shower.
- (ii) Each student has a supervisor.

The former is true only if each of the rooms has its own individual shower, not shared with other rooms, but (ii) remains true even if students have to share supervisors. Clearly, the truth-conditions of such sentences depend on what is generally known about hotels and universities, or, in other words, the satisfaction conditions for *have* incorporate a parameter whose value is to be filled in by a knowledge base. Likewise for gradable adjectives like *old*: the truth-conditions of a sentence like *John is old* depend crucially on age expectations in the setting at hand.

2. Cp. Lindholm 1969, Seuren 1985:140.

3. For most speakers (25d) will not be as obviously ungrammatical as e.g. (25c). Yet an active sentence like *I think it* is clearly to be rejected. There is admittedly a problem here, which will need to be sorted out. One might surmise that some verbs have different subcategorizations for their active and their passive forms.