

## Chapter 10

### The Derived Constituent Structure of the West Germanic Verb-Raising Construction

Anthony S. Kroch and  
Beatrice Santorini

#### 1 Introduction

The analysis of the verb-raising phenomenon in West Germanic<sup>1</sup> poses an interesting and difficult problem for syntactic theory. Although verb raising is a productive process that gives rise to unbounded syntactic dependencies, it also appears to exhibit features associated with morphological processes, which are ordinarily considered more local. This mix of characteristics raises the question of whether verb raising should be treated as a case of morphological verb incorporation or given an entirely syntactic derivation. In order to forestall terminological misunderstanding, we note here that we

---

\* Many people have helped us with this paper. For discussing with us the questions raised by our analysis, correcting our misconceptions, and providing us with native speaker judgments, we would like to thank Mark Baltin, Hans-Ulrich Block, Lori Davis, Dominique Estival, Liliane Evans, Robert French, Tilman Höhle, Gabriele Hoenigswald, Mark Johnson, Richard Kayne, Willy Kraan, Ann Langenakens, Elsa Lattey, Alec Marantz, Michael Moortgat, Anne Marie Musschoot, Susan Pintzuk, Gertrude Reichenbach, Henk van Riemsdijk, Kenneth Safir, Rex Sprouse, Therese Torris, and the participants in the Princeton Workshop on Comparative Grammar (1986) and the Fourth Workshop on Comparative Germanic Syntax (May 1987). We would also like to thank Mark Steedman for a number of helpful discussions and Jack Hoeksema for many discussions and native speaker judgments. We owe a particular debt of gratitude to Henry Hoenigswald, whose exceptionally clear and consistent judgments on many difficult examples and whose keen linguistic insight have contributed greatly to the analysis presented here. Finally, we must thank Annie Zaenen, whose linguistic analysis of the verb-raising construction we have adopted, and Aravind Joshi, who provided the formal meta-language in which we express our instantiation of that analysis. Of course, we alone are responsible for any remaining errors of fact or judgment in the analysis presented here. The work reported in this paper was funded in part by NSF grant DCR 84-11726, Aravind Joshi, Principal Investigator.

will use the term *morphological* in this paper in an extended sense to refer to any analysis of the verb-raising construction that involves the formation of a complex verb, whether in the lexicon or in the syntax. Generative grammarians have almost unanimously assumed that a morphological incorporation analysis of the verb-raising construction is correct. In this paper we argue against the consensus and claim that a syntactic analysis of verb raising is preferable to a morphological one on both empirical and conceptual grounds. We begin by showing that the claim that verb raising involves clause pruning or clause union cannot be maintained. We then show that four of the five arguments that have been advanced in support of the morphological incorporation analysis are incorrect and that the fifth argument is inconclusive. From this, we conclude that one subcase of verb raising—namely, the raising of *to*-infinitives—should not be described as an instance of morphological incorporation. In the case of bare infinitive raising, the empirical evidence from standard Dutch and German is consistent with either a morphological or a syntactic analysis, and we argue on the basis of conceptual economy that bare infinitive raising in standard Dutch and German should be given the same analysis as *to*-infinitives. In support of this conclusion, we present comparative evidence from non-standard and older varieties of West Germanic.

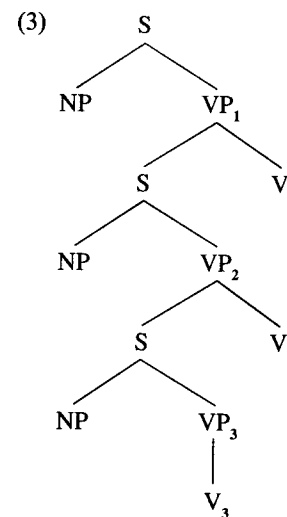
In order to formulate our own analysis of the verb-raising construction, we turn to the *tree-adjoining grammar* (TAG) formalism developed by Joshi, Levy, and Takahashi (1975), Joshi (1983), and Kroch and Joshi (1985). Joshi (1983) was the first to point out that the crossing dependencies produced by verb raising in Dutch are amenable to a TAG analysis. We present two syntactic analyses in the TAG formalism, the first of which turns out to reconstruct certain undesirable aspects of the morphological incorporation analysis and to assign a linguistically implausible structure to at least one class of cases. Our second TAG analysis instantiates in a natural way the syntactic analysis of verb raising proposed by Zaenen (1979) and has many of the attractive features that one would expect to find in a contemporary transformational account. We conclude with a brief discussion of the open questions that remain concerning the status of verb raising in the grammars of Dutch and German. We note here that since the completion of this paper, a very interesting proposal has been advanced according to which most cases of *to*-infinitive verb raising in Dutch are the result of *to*-infinitive extraposition and leftward scrambling of complements (Den Besten et al. 1988; Den Besten and Rutten 1989). This work, like the study presented here, relates verb raising to syntactic extraposition, although, unlike our study, only for a subset of cases. Extending the

proposal to German, evaluating its validity, and relating it to other recent work on the verb-raising construction in the TAG framework (Joshi 1990) are at the focus of our current research on the topic.

The West Germanic verb-raising construction is illustrated in (1) and (2). As has become customary, we give examples as subordinate clauses in order to abstract from the effects of verb-second movement and constituent preposing, which apply to root clauses in Dutch and German.

- (1) a. daß Hans Peter Marie schwimmen lassen sah (German)  
 that Hans Peter Marie swim make saw  
 'that Hans saw Peter make Marie swim'  
 b. daß Hans Peter Marie zu schwimmen zu zwingen verbot  
 that Hans Peter Marie to swim to force forbade  
 'that Hans forbade Peter to force Marie to swim'
- (2) a. dat Jan Piet Marie zag laten zwemmen (Dutch)  
 that Jan Piet Marie saw make swim  
 'that Jan saw Piet make Marie swim'  
 b. dat Jan Piet Marie verbood te dwingen te zwemmen  
 that Jan Piet Marie forbade to force to swim  
 'that Jan forbade Piet to force Marie to swim'

The underlying structure associated with (1) and (2) is shown schematically in (3).<sup>2</sup>



In the underlying sequence of verbs in (3), the verbs are ordered with the most deeply embedded verb leftmost and the matrix verb rightmost. In

general, this word order is mapped directly onto derived structure in German, whereas the surface order of verb sequences in Dutch is the mirror image of the underlying order.

The analysis of verb raising currently accepted by most investigators treats the verb sequences in (1) and (2) as syntactically derived lexical items, known in the literature as *verb clusters*. The first and best-known attempt to formulate the verb cluster analysis in the framework of transformational grammar is due to Evers (1975). His treatment of the verb-raising construction embodies two independent claims: first, that movement of the verb and verb cluster formation occur as a single process and second, that this process of verb raising prunes the embedded clause boundaries of the structure to which it applies. More recent analyses (Zaenen 1979; Den Besten and Edmondson 1983; Haegeman and Van Riemsdijk 1986), though usually maintaining the verb cluster, have rejected the clause-pruning claim. In what follows, we present several empirical and conceptual arguments bearing on this claim that lead us to reject it as well.

## 2 Arguments for and against Clause Pruning

### 2.1 Scope of Negation

**2.1.1 Evidence for Scope Ambiguity** Evers (1975) claims that in clauses with nonextraposed complements, negative operators that precede the verb sequence can take scope only over the matrix clause, but not over the underlying embedded clause.<sup>3</sup>

(4) weil sie die Kraniche nicht zu fotografieren versuchen  
since they the cranes not to photograph try

That is, he claims that (4) is synonymous with (5a) only, rather than with (5b) or with both sentences in (5).

- (5) a. weil sie nicht versuchen, die Kraniche zu fotografieren  
since they not try the cranes to photograph  
'since they are not trying to photograph the cranes'  
b. weil sie versuchen, die Kraniche nicht zu fotografieren  
since they try the cranes not to photograph  
'since they are trying not to photograph the cranes'

Evers assumes that the relationship between semantic scope and syntactic structure is constrained so as to allow sentence negation to take scope only over clauses that are present at derived structure, and he concludes that verb raising results in clause pruning, since the inability of negation to take

scope over embedded clauses follows straightforwardly under the clause-pruning hypothesis but is difficult to reconcile with an analysis under which verb raising does not reduce the underlying biclausal to a derived monoclausal structure.

Contrary to Evers's claim, however, the sentence in (4) is in fact ambiguous between the two readings in (5). The reversal of scope in the preferred readings of the two examples in (6), where sentence negation is in its canonical position between any NP arguments and any PP modifiers or complements of the verb, shows clearly that Evers's claim concerning the scope of negation is incorrect and that negation in an embedded clause can take scope either over its own clause, as in (6a), or over the matrix clause, as in (6b).

- (6) a. daß ich die Arbeit nicht mit Verspätung einzureichen versuche  
that I the paper not with delay in-to-hand try  
'that I am trying not to hand in the paper late'  
b. daß ich die Arbeit nicht mit Verspätung einzureichen wage  
that I the paper not with delay in-to-hand dare  
'that I do not dare to hand in the paper late'

The example in (7) provides further evidence that sentence negation can take scope over an embedded clause.

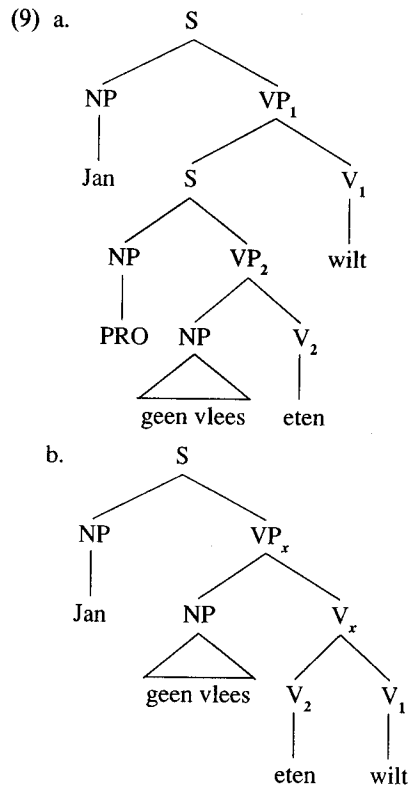
- (7) daß Julia ihren Spinat nicht essen zu müssen versucht  
that Julia her spinach not eat to have-to tries  
'that Julia is trying not to have to eat her spinach'

The narrow scope reading given in the gloss is by far the preferred reading of (7); the wide scope reading 'that Julia is not trying to have to eat her spinach' is virtually unavailable. Thus, if we accept Evers's assumption concerning the relationship between syntax and semantics, the facts of sentence negation actually cut against clause pruning.

Verb-raising sentences in West Flemish and Swiss German exhibit the same scope ambiguity that we have just noted for standard German (Lötscher 1978; Haegeman and Van Riemsdijk 1986). Thus, the sentences in (8) are ambiguous between a wide scope reading 'that Jan/Hans did not want to eat meat' and a narrow scope reading 'that what Jan/Hans wanted to do was not eat meat'.<sup>4</sup>

- (8) a. da Jan geen vlees hee willen eten (West Flemish)  
that Jan no meat has want-to eat  
b. das de Hans kä fläisch hät wele ässe (Swiss German)  
that the Hans no meat has want-to eat

**2.1.2 Haegeman and Van Riemsdijk's Treatment of Scope Ambiguity** Haegeman and Van Riemsdijk (1986) present a treatment of the ambiguity of negation and quantifiers that is based on their analysis of verb-raising construction. According to their treatment, which is essentially a variant of the analysis given by Evers (1975), verb raising consists of two separate processes: first, syntactic reanalysis of the sequence of verbs accompanied by clause union and second, inversion of the constituents of the reanalyzed verb sequence, which gives rise to variations on the word order of the underlying sequence of verbs. We illustrate Haegeman and Van Riemsdijk's rule of reanalysis using the West Flemish example in (8a), which is their example (52). Following their lead, we have replaced the present perfect tense in (8a) by the simple present in order to simplify the representation in (9); this replacement does not affect the scope ambiguity of negation.



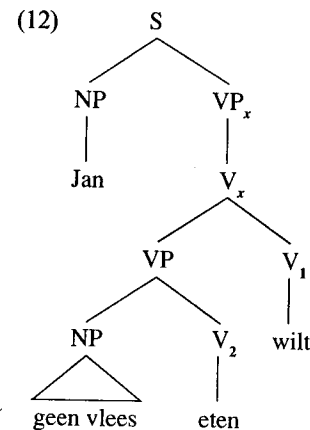
Reanalysis applies to the biclausal structure in (9a) to yield the mono-

clausal representation in (9b), which contains a complex lexical constituent  $V_x$ , the verb cluster. Note that Haegeman and Van Riemsdijk treat modals as control verbs in underlying structure. After reanalysis, the PRO subject of the modal may and must be unrealized in accordance with their formulation of the  $\theta$ -Criterion. Inverting the constituents of the verb cluster yields the desired order of *wilt* and *eten*.

Haegeman and Van Riemsdijk extend their treatment to the dialectal variant of the verb-raising construction known as verb projection raising (Lötischer 1978; Den Besten and Edmondson 1983). In contrast to standard Dutch and German, certain West Germanic dialects, including West Flemish, allow NP arguments to occur within the sequence of verbs, as in (10a).

- (10) a. da Jan wilt geen vlees eten (West Flemish)  
 that Jan wants-to no meat eat  
 b. da Jan geen vlees wilt eten  
 that Jan no meat wants-to eat
- (11) a. \*dat Jan wil geen vlees eten (standard Dutch)  
 that Jan wants-to no meat eat  
 b. dat Jan geen vlees wil eten  
 that Jan no meat wants-to eat

In order to account for the position of *geen vlees* within the verb sequence in (10a), Haegeman and Van Riemsdijk assumes that in West Flemish the matrix verb in the structure in (9a) can be reanalyzed not only with the embedded verb phrase, but also with the embedded verb phrase. The resulting structure is shown in (12). Inversion of the immediate constituents of the verb cluster  $V_x$  yields the desired word order.



The rule of reanalysis proposed by Haegeman and Van Riemsdijk is not to be confused with a transformation that derives monoclausal from biclausal representations. Rather, reanalysis associates a set (generally a pair) of structures—namely, an unreanalyzed and one or more reanalyzed representations—with a given string. These multiple representations are then simultaneously available as input to syntactic processes such as movement. We would like to emphasize that a treatment of the West Germanic verb-raising construction that invokes reanalysis represents an unmotivated complication of the grammars of Dutch and German if an empirically equivalent treatment is available that does not require the multiple representations proposed by Haegeman and Van Riemsdijk. As we will show in section 4, such a simpler treatment can indeed be given. Moreover, even if certain constructions, notably the Romance and West Germanic subjectless causative constructions, should turn out to provide evidence for allowing the possibility of reanalysis as a descriptive device in Universal Grammar, it is clear that each particular appeal to the notion of reanalysis must be motivated on its own merits. We will show in the remainder of this section that the empirical evidence that Haegeman and Van Riemsdijk advance in support of their claim that verb raising involves clause union and reanalysis actually turns out to be problematic for their analysis.

Haegeman and Van Riemsdijk observe that (10b) is ambiguous with respect to scope of negation and propose the following analysis of the ambiguity. Given that the tensed verb *wilt* c-commands the negative NP *geen vrees* in the unreanalyzed representation in (9a) and that this c-command relation is reversed in the reanalyzed representation in (9b), they argue that the scope ambiguity of (10b) reflects the configurational difference between the two representations in (9).<sup>5</sup> In contrast to (10b), the sentence in (10a) allows only the narrow scope reading, a fact first noted by Lötscher (1978) for Swiss German. Haegeman and Van Riemsdijk attribute the absence of a wide scope reading to the fact that the negative NP *geen vrees* fails to c-command the tensed verb both in the unreanalyzed structure in (9a), which (10a) shares with (10b), and in the reanalyzed structure in (12). Thus, (10a) is not associated with any representation in which negation c-commands the modal.

If we take seriously Haegeman and Van Riemsdijk's proposal that scope relations directly reflect S-Structure configurations and that the basis for scope ambiguities is the availability of reanalyzed structures, as in (9b) and (12), then we are led to expect that sentences like (13) should be unambiguous in languages like English, in which verb sequences do not undergo reanalysis.

(13) The patient in ward four may eat nothing.

In particular, negation in such sentences should not take narrow scope over the modal, since the negative quantified NP *nothing* fails to c-command the tensed verb *may* at S-Structure.<sup>6</sup> Indeed, Haegeman and Van Riemsdijk claim that a wide scope interpretation of (13), their (88a), is unavailable, except under a marked intonation where *nothing* receives special stress. But in fact, sentences like (13) are perfectly ambiguous, as we show in (14). Note in particular that the wide scope reading in (14a) does not depend on intonational help, and that *nothing* in (14b) may receive stress without the wide scope reading being induced.

- (14) a. Unless the doctor gives permission, the patient may eat nothing.  
           'There is nothing that the patient is permitted to eat.'  
       b. If the doctor gives permission, the patient may eat nothing.  
           'The patient is permitted not to eat anything.'

Given the fact that negation can take wide scope in sentences like (13), the logic of Haegeman and Van Riemsdijk's argument dictates that the modal *may* must undergo reanalysis with the VP *eat nothing* in English. We are not aware of any independent evidence in favor of such an analysis, nor has such an analysis ever been suggested in the literature to our knowledge. Rather, we follow May (1985) in assuming that in English, scope relations are established at Logical Form (LF), an independently motivated level of syntactic representation derived from S-Structure by a rule of quantifier raising. This rule adjoins operators such as the negative quantifier *nothing* to the VP or the S in which they occur (May 1985:42). Under this approach, the adjunction of *nothing* at LF to the S that contains it at S-Structure results in the wide scope interpretation of negation illustrated in (14a), whereas its adjunction to VP gives rise to the narrow scope reading in (14b).

Since it is necessary to provide a treatment of scope ambiguities in English that is based on the rule of quantifier raising, a unitary treatment of the English and the West Germanic scope facts requires the extension of the quantifier-raising treatment to the West Germanic case, and reanalyzed structures like (9b) or (12) become irrelevant to the treatment of the scope facts, even if we continue to accept their existence. But then the fact that negative existential NPs that occur within the sequence of verbs take only narrow scope loses the explanation that Haegeman and Van Riemsdijk would give it, since the structures that they assign to (10a) and (10b) are identical prior to reanalysis. We conclude, therefore, that the

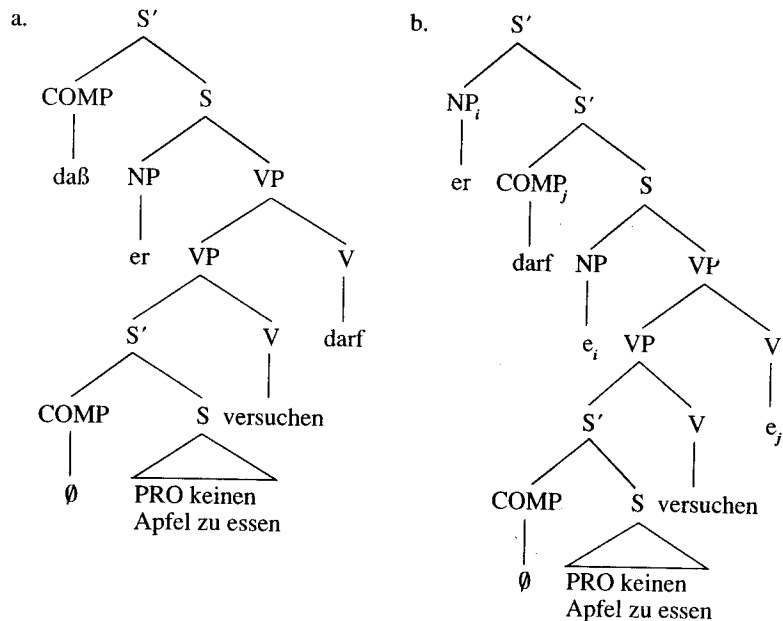
treatment of scope proposed by Haegeman and Van Riemsdijk (1986) is conceptually weak and empirically inadequate.

**2.1.3 A Quantifier-Raising Treatment of Scope Ambiguity** If we adopt May's rule of quantifier raising and extend it to negative operators like 'not' and 'never' in West Germanic, we are able to give an alternative treatment of the scope facts discussed by Evers (1975) and Haegeman and Van Riemsdijk (1986). Consider the scope facts for sentences containing nonextraposed clausal complements.

- (15) a. daß er keinen Apfel zu essen versuchen darf  
 that he no apple to eat try may
- b. Er darf keinen Apfel zu essen versuchen.  
 he may no apple to eat try

According to the generally accepted analysis of West Germanic clause structure, the main clause in (15b) is derived from an underlying verb-final structure essentially identical to that of (15a) by moving the tensed verb into COMP and by preposing exactly one maximal projection, here the subject *er*, to a clause-initial XP position. We give the S-Structure representations for the sentences of (15) in (16).

(16)



Both (15a) and (15b) are ambiguous between the narrow scope reading 'he is permitted to try not to eat an apple' and the wide scope reading 'he is not permitted to try to eat an apple'. In order to account for this scope ambiguity, we assume that quantifiers in German and Dutch can escape by quantifier raising out of untensed complement clauses when the clause is governed by the verb that subcategorizes for it.<sup>7</sup> Thus, the negative quantified NP *keinen Apfel* in (15) can adjoin to either the embedded or the matrix clause, giving rise to the narrow and the wide scope readings in (15), respectively. Quantified NPs containing the existential quantifier *ein* exhibit precisely the same scope ambiguity between a narrow and a wide scope interpretation.

- (17) daß Hans eine Norwegerin heiraten will  
 that Hans a Norwegian marry wants-to  
 'that Hans want to marry a Norwegian'

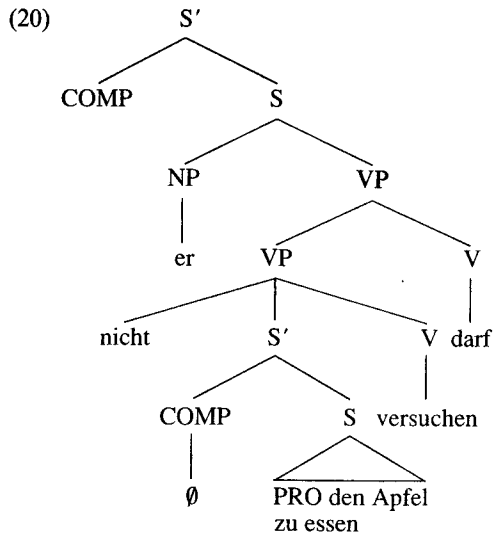
The ambiguity in (17) is reflected in the existence of the two paraphrases 'that there is a certain Norwegian that Hans wants to marry' and 'that Hans wants to marry someone who is a Norwegian'. The negative operators *nicht* 'not', *nie* 'never', and *nicht mehr* 'not any more' behave in a way parallel to quantified NPs. We illustrate this parallelism by using examples with *nicht*, but analogous examples can readily be constructed with *nie* and *nicht mehr*. Thus, both sentences in (18) are ambiguous between a narrow scope reading 'he is permitted to try not to eat the apple' and a wide scope reading 'he is not permitted to try to eat the apple'.

- (18) a. daß er den Apfel nicht zu essen versuchen darf  
 that he the apple not to eat try may
- b. Er darf den Apfel nicht zu essen versuchen.  
 he may the apple not to eat try

One difference between negative operators and quantified NPs is that the positioning of the former is somewhat freer. Thus, they are not restricted to their canonical position between NP complements of the verb and PPs but can also be generated as a sister of complement clauses, as in the preferred reading of (19).

- (19) a. daß er nicht den Apfel zu essen versuchen darf  
 that he not the apple to eat try may  
 'that he is not permitted to try to eat the apple'
- b. Er darf nicht den Apfel zu essen versuchen.  
 he may not the apple to eat try  
 'He is not permitted to try to eat the apple.'

The structure of (19a) on its preferred reading is given in (20).

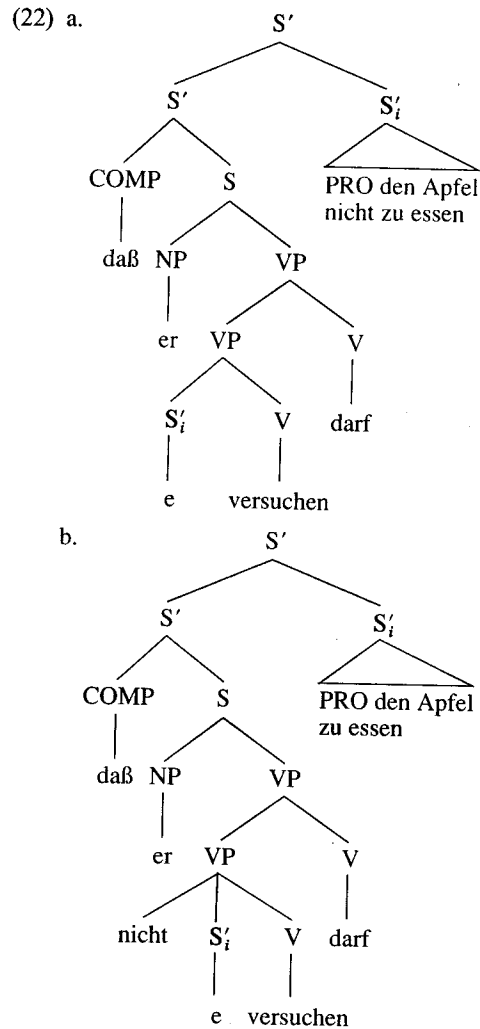


Since *nicht* in this position originates outside of the embedded clause and since adjunction of negation to the embedded S in LF would be ruled out by standard constraints on trace binding, the structure in (20) yields only a wide scope reading.

The treatment of sentence negation and outlined so far extends straightforwardly to sentences containing extraposed S'-complements.

- (21) a. daß er versuchen darf, den Apfel nicht zu essen  
 that he try may the apple not to eat  
 'that he is permitted to try not to eat the apple'  
 b. daß er nicht versuchen darf, den Apfel zu essen  
 that he not try may the apple to eat  
 'that he is not permitted to try to eat the apple'

The sentences in (21) are derived by extraposing the S'-complements in (18a) and (19a), respectively, and their S-Structure representations are given in (22).



In (22a) *nicht* cannot escape out of its clause, since *versuchen* fails to govern the complement clause in its extraposed position. Hence, only the narrow scope reading is available in (21a). In (22b), on the other hand, negation is unable to escape out of the tensed matrix clause to a position from where it could c-command the extraposed clause. As a result, only the wide scope reading is available in (21b). Preposing the subject *er* or the tensed verb *darf* does not affect the configurational relations relevant for determining the scope of negation; hence, the matrix clauses in (23) are unambiguous in the same way as the corresponding subordinate clauses in (21) are.

- (23) a. Er darf versuchen, den Apfel nicht zu essen.  
 he may try the apple not to eat  
 'He is permitted to try not to eat the apple.'  
 b. Er darf nicht versuchen, den Apfel zu essen.  
 he may not try the apple to eat  
 'He is not permitted to try to eat the apple.'

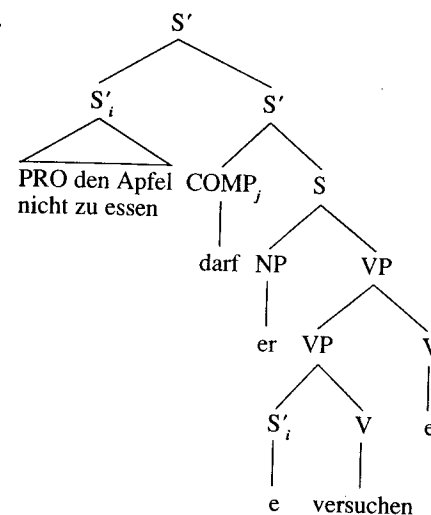
The scope facts for quantified NPs in extraposed clauses are the same as for negation.

The scope facts that we observe in connection with verb projection raising in (10) are parallel to the facts for *S'*-extraposition. That is, sentences in which a verbal projection or a clause has not undergone movement are ambiguous, whereas sentences in which either verb projection raising or *S'*-extraposition has occurred permit only a narrow scope reading. We conclude from this parallelism that the facts in (10) are consistent with a syntactic analysis of verb projection raising and that they fail to provide evidence in favor of the analysis presented by Haegeman and Van Riemsdijk (1986).

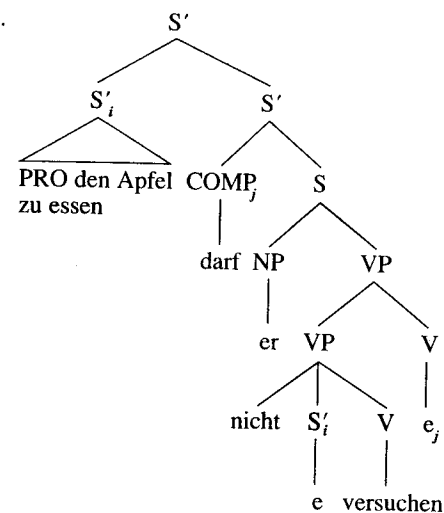
The configurational relations relevant for determining scope are affected by instances of leftward movement such as constituent preposing in the same way as they are by instances of rightward movement such as clausal extraposition and verb projection raising. Consider the main clauses in (24), which are derived by preposing the clausal complements in the underlying structures associated with (18a) and (19a) and which have the derived structures in (25).

- (24) a. Den Apfel nicht zu essen darf er versuchen.  
 the apple not to eat may he try  
 'He is permitted to try not to eat the apple.'  
 b. Den Apfel zu essen darf er nicht versuchen.  
 the apple to eat may he not try  
 'He is not permitted to try to eat the apple.'

(25) a.



b.



As in the case of extraposition, *nicht* in (25a) cannot escape out of the preposed clause and hence fails to c-command the matrix clause. In (25b), on the other hand, *nicht* cannot escape out of the matrix clause. As a result, only the narrow scope reading is available in (24a), and only the wide scope reading in (24b).

In summary, the approach to scope that we have outlined provides the basis for a uniform treatment of scope phenomena in English and West Germanic. In particular, it provides a uniform account of the fact that in



West Germanic the scope ambiguity of quantifiers and negative operators disappears when the constituents containing them are moved to nonargument positions, and it correctly predicts that only the narrow scope reading remains available after movement. Under Haegeman and Van Riemsdijk's approach, by contrast, the parallelism between the scope facts in the case of verb projection raising on the one hand and extraposition and constituent preposing on the other hand is not explained.

## 2.2 Clitic Movement

In this section we will show that the evidence based on clitic movement in Dutch and German that Evers (1975) and Haegeman and Van Riemsdijk (1986) adduce in favor of clause pruning actually cuts against it. Following Evers (1975), Zaenen (1979) observes that Dutch clitic direct objects are obligatorily preposed from their base-generated position to the position immediately following the subject.

- (26) a. dat Jan Piet het kadootje gaf  
that Jan Piet the present gave  
'that Jan gave Piet the present'  
b. \*dat Jan Piet het gaf  
that Jan Piet it gave  
'that Jan gave it to Piet'  
c. dat Jan het Piet gaf  
that Jan it Piet gave  
(same as (26b))

Clitics that originate in bare infinitive complements are not clause-bound and can be preposed either to the position following the embedded subject or to the position following the matrix subject, as in (27a) and (27b), respectively.

- (27) a. dat we de jongens het aan Piet hoorden vertellen  
that we the boys it to Piet heard tell  
'that we heard the boys tell it to Piet'  
b. dat we het<sub>i</sub> de jongens e<sub>i</sub> aan Piet hoorden vertellen  
that we it the boys to Piet heard tell  
(same as (27a))

By contrast, clitics that originate in *to*-infinitives are clause-bound, as Zaenen (1979) points out.

- (28) a. dat we de jongens het aan Piet verboden te vertellen  
that we the boys it to Piet prohibited to tell  
'that we prohibited the boys from telling it to Piet'

- b. \*dat we het<sub>i</sub> de jongens e<sub>i</sub> aan Piet verboden te vertellen  
that we it the boys to Piet prohibited to tell  
(same as (28a))

The pattern in (28) is analogous to that in (29), where the entire clausal complement is extraposed.

- (29) a. dat we de jongens verboden het aan Piet te vertellen  
that we the boys prohibited it to Piet to tell  
(same as (28a))  
b. \*dat we het<sub>i</sub> de jongens verboden e<sub>i</sub> aan Piet te vertellen  
that we it the boys prohibited to Piet to tell  
(same as (28a))

This parallelism shows that the *S'*-nodes dominating the *to*-infinitive complements in (28) and (29) have not been pruned. It is these nodes that block the movement of the clitic pronoun in (28b) and (29b) since Dutch, like many other languages, does not allow the raising of clitics out of full clausal complements.

The fact that clitics can move out of bare infinitive complements, as in (27b), has been interpreted as evidence for clause pruning. But the grammaticality of (27b) does not demonstrate that clause pruning has taken place, since it is consistent not only with clause pruning but also with an alternative analysis under which bare infinitive complements are dominated by VP or S, rather than *S'*. Under the latter analysis, clitic movement might be ruled out by Subjacency in (28b), but not in (27b). The clitic movement facts for German are more complicated than those for Dutch. First, there are two landing sites for clitic movement rather than just one: the standard Dutch position immediately following the subject and the position immediately following the COMP node.<sup>8</sup> Second, although some speakers allow clitic movement only in the case of bare infinitives just as in Dutch, many also accept clitic movement out of *to*-infinitives (Van Riemsdijk 1984; Haegeman and Van Riemsdijk 1986).

- (30) daß uns<sub>i</sub> Hans e<sub>i</sub> seinen Wagen zu zeigen versucht hat  
that to-us Hans his car to show tried has  
'that Hans tried to show us his car'

For such speakers, the facts of clitic movement provide no evidence against clause pruning, whether in the case of *to*-infinitives or in the case of bare infinitives. On the other hand, the facts in (30) also fail to demonstrate that the clause boundary in the case of nonextraposed *to*-infinitives has in fact been pruned. This is because clitic movement is acceptable even when the

S'-complement in which the clitic originates is extraposed and therefore cannot have undergone clause pruning (Kvam 1983). As the examples in (31) show, clitic movement out of extraposed clauses can take place to either landing site.

- (31) a. Ich habe  $e_i$  vorhin schon versucht  $e_i$  darzulegen.  
 I have it before already tried to-explain  
 'I have already tried to explain it before.'
- b. wenn ich Ihnen<sub>i</sub> versuchen darf,  $e_i$  ein wenig zu helfen  
 if I to-you try may a little to help  
 'if I might try to help you a little'
- c. daß uns<sub>i</sub> Hans versuchte,  $e_i$  seinen Wagen zu zeigen  
 that to-us Hans tried his car to show  
 (same as (30))
- d. daß Hans uns<sub>i</sub> versuchte,  $e_i$  seinen Wagen zu zeigen  
 that Hans to-us tried his car to show  
 (same as (30))

In summary, the Dutch clitic movement facts in (28b) show that clause union cannot have taken place in the case of *to*-infinitives, even though verb raising has occurred. The German examples in (31) show the converse—namely, that clitic movement is possible even in the absence of verb raising, so that the clitic movement facts fail to bear on the existence of clause pruning in that language. Haegeman and Van Riemsdijk (1986) adduce the fact that clitics can be preposed out of *to*-infinitives in German, as in (30), as evidence for their claim that the West Germanic verb-raising construction is an instance of clause union. Their argument is vitiated, however, by their failure to recognize the existence of sentences like (31). Moreover, the fact that clitics can move out of *to*-infinitives in German actually turns out to be problematic for their analysis since they assume that "the effects of movement must be compatible with the structural constraints in all dimensions, not just in one" (Haegeman and Van Riemsdijk 1986:448). Thus, although clitic movement is licensed by the absence of a clause boundary in the monoclausal representation that results from reanalysis, the presence of an *S'* in the unreanalyzed, biclausal dimension should block clitic movement and (given their assumption) should rule it out in German just as in Dutch.

In this connection, a related difficulty for Haegeman and Van Riemsdijk's analysis should be pointed out. In standard Dutch and German, *to*-infinitives can undergo extraposition, but bare infinitives cannot.

- (32) a. daß Hans versuchte, uns seinen Wagen zu zeigen  
 that Hans tried to-us his car to show  
 'that Hans tried to show us his car'
- b. \*daß Hans wollte uns seinen Wagen zeigen  
 that Hans wanted-to to-us his car show  
 'that Hans wanted to show us his car'

Given Haegeman and Van Riemsdijk's assumption concerning movement, the contrast between (32a) and (32b) is problematic since *to*-infinitive complements are not dominated by *S'* after reanalysis and hence cannot undergo *S'*-extraposition. Rather, both bare infinitives and *to*-infinitives are dominated by VP in the reanalyzed structure. Haegeman and Van Riemsdijk's treatment would therefore lead us to expect (32a) to be ungrammatical, since verb projection raising in standard Dutch and German is ruled out.

### 2.3 Binding of Reciprocal Pronouns

Reuland (1980) presents an argument against clause pruning based on the interpretation of Dutch reciprocal pronouns. He notes that if verb raising resulted in clause pruning, (33) would be expected to be grammatical since the matrix subject *de vrouwen* would be available as an antecedent for the reciprocal pronoun *elkaar*.

- (33) \*dat de vrouwen de kamer elkaar vroegen te helpen  
 that the women the parliament each-other asked to help  
 'that the women asked Parliament to help each other'

But the ungrammaticality of (33) is expected if verb raising does not affect the clausal status of the *to*-infinitive, as shown in (34).

- (34) \*dat de vrouwen de kamer<sub>i</sub> [<sub>S'</sub> PRO<sub>i</sub> elkaar<sub>i</sub> e<sub>j</sub>] vroegen te helpen<sub>j</sub>

Under the assumption that the movement of *te helpen* leaves a trace that governs the reciprocal pronoun *elkaar*, the embedded clause is the domain in which *elkaar* must be bound, according to the binding principles of Government-Binding Theory (Chomsky 1981). The only potential antecedent for *elkaar* is the subject of the embedded clause, PRO. But since PRO shares the number feature of its controller, the singular NP *de kamer*, it fails to agree with the inherently plural reciprocal pronoun and (33) is correctly ruled out. An analogous argument can be constructed on the basis of the German counterpart of (33).

- (35) \*daß die Frauen den Bundestag einander zu helfen baten  
 that the women the parliament each-other to help asked  
 (same as (33))

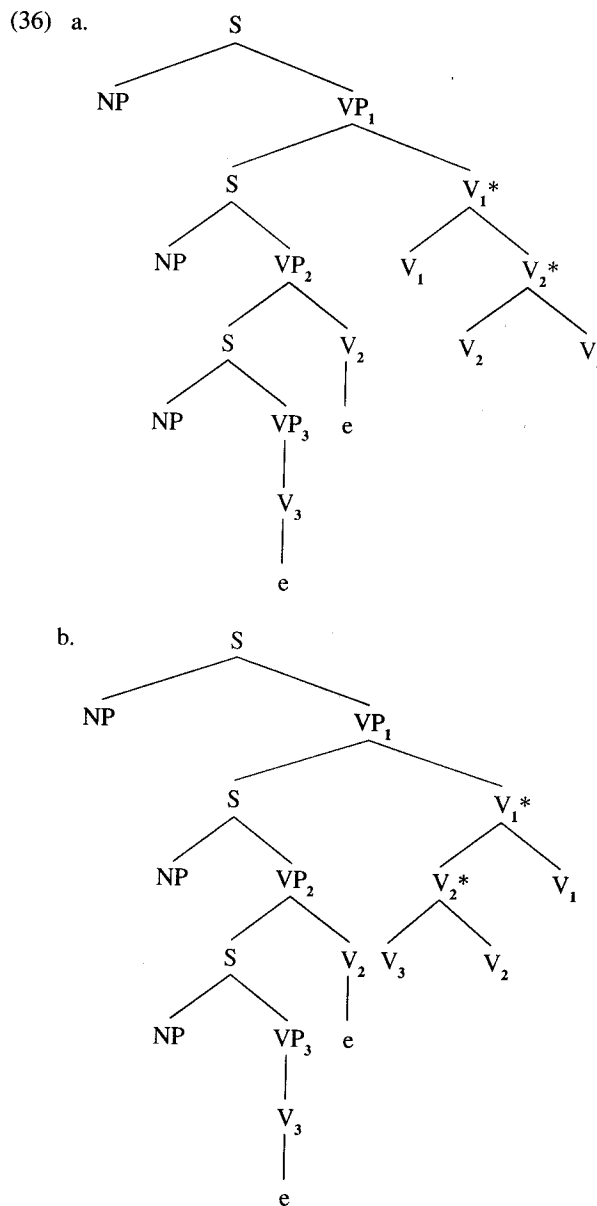
Haegeman and Van Riemsdijk (1986) agree that the facts of binding argue against a clause-pruning analysis of the verb-raising construction and claim that their analysis is preferable to that of Evers (1975) because the binding facts can be stated on the unreanalyzed, biclausal representation of verb-raising sentences, in which subjects are configurationally defined. But since they fail to explain why the principles of the binding theory apply to the biclausal rather than to the monoclausal structure in their two-dimensional representation, their analysis is stipulative. This conceptual weakness is compounded by the fact that they require syntactic movement to meet constraints on both the unreanalyzed and the reanalyzed representations, whereas they assume the interpretation of scope to be licensed by configurational relations in the reanalyzed representation only. Note that Reuland's argument against clause pruning is more highly theory-dependent than the first two arguments that we have presented. It hinges on the assumption, central to successive versions of transformational grammar, that grammatical relations, in particular the notion of subject, are configurationally defined. If it turns out that the interpretation of reflexive and reciprocal pronouns must be established on the basis of thematic or grammatical relations rather than on the basis of syntactic configurations, then the argument will no longer go through.

**2.4 The Projection Principle**

In addition to these empirical arguments for rejecting the clause-pruning claim, we and others (Den Besten and Edmondson 1983; Kroch and Santorini 1985; Haegeman and Van Riemsdijk 1986) have noted that clause pruning is incompatible with one of the fundamental tenets of Government-Binding Theory, the Projection Principle, under which syntactic structure is constrained to reflect lexical argument structure at every syntactic level (Chomsky 1981, 1982, 1986b).

**2.5 Verb Raising as Morphological Incorporation**

In order to avoid the empirical and conceptual difficulties discussed above and in order to make the verb cluster analysis conceptually consistent with the principles of Government-Binding Theory, verb cluster formation must be formulated as a process distinct from clause pruning. A restatement of Evers's treatment of the verb-raising construction that does not involve clause pruning is presented by Den Besten and Edmondson (1983). Under their analysis, an underlying structure like (3) is related to a derived structure like (36a) in Dutch or (36b) in German.



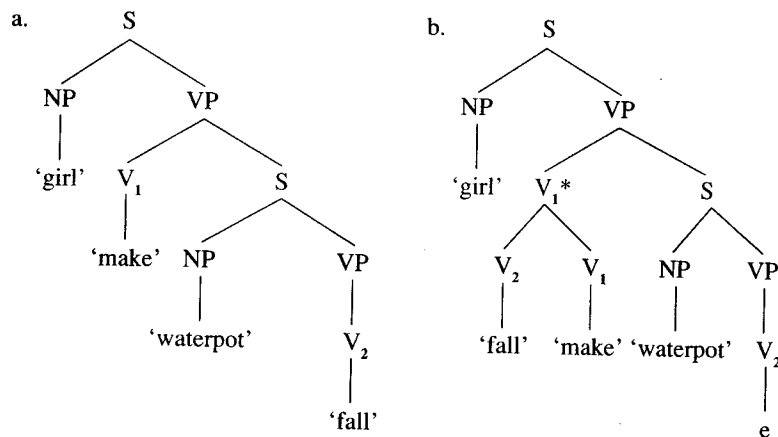
The structures in (36) are derived from the underlying structure in (3) by cyclic Chomsky-adjunction. The most deeply embedded infinitive  $V_3$  adjoins to  $V_2$ , the verb minimally c-commanding it, and the resulting

constituent in turn adjoins to the next higher verb,  $V_1$ . We have marked the constituents formed by adjunction with asterisks. The verb cluster is the constituent dominated by the node  $V_1^*$ . Dutch and German differ in the direction of adjunction so that verb cluster formation is string-vacuous in German, but not in Dutch.

The analysis of the verb-raising construction embodied in (36) is strikingly reminiscent of analyses of morphological causatives proposed by Marantz (1984) and others. Consider, for instance, the Chicheŵa causative construction in (37), for which Baker (1988) proposes the underlying and derived structures in (38).

- (37) Mtsikana anau-gw-ets-a mtsuko.  
 girl AGR-fall-make-ASP waterpot  
 'The girl made the waterpot fall.'

(38)



The structure in (38b) is derived from that in (38a) by morphological incorporation of the embedded verb into the matrix verb. Apart from the fact that the verb phrase is head-initial in Chicheŵa but head-final in West Germanic and that West Germanic verb raising applies to a greater embedding depth,<sup>9</sup> the structure derived by verb raising in (36) is identical to that derived by verb incorporation in (38). Given this remarkable coincidence of form, it is tempting to reformulate Den Besten and Edmondson's modified version of Evers's analysis as a claim that West Germanic verb raising is an instance of verb incorporation in Marantz's and Baker's sense. This way of looking at the verb cluster analysis is attractive because it makes that analysis stateable without ad hoc weakening of the theory of grammar. Furthermore, it makes the analysis of the verb-raising construc-

tion directly relevant to one of the most active areas of current research, the interface between morphology and syntax. As we will show in what follows, however, such a treatment of verb raising is untenable, at least in its most general form.

### 3 Arguments against the Verb Cluster

Having established that the verb-raising construction involves neither clause pruning nor clause union, we now turn to a discussion of the arguments bearing on the claim that the clause-final sequence of verbs forms a syntactically derived lexical constituent, the verb cluster, in West Germanic. Evers's original arguments for the verb cluster are based on evidence from nominalization, the position of sequence negation, and gapping. More recently (Evers 1981), he has proposed a further argument based on coordination. Finally, Den Besten and Edmondson (1983) have argued that the verb cluster hypothesis provides the basis for an elegant treatment of variations on the order of clause-final verbs in standard German. In this section we will discuss and refute each of these arguments in turn.

#### 3.1 Nominalization

Evers (1975) observes that verbs in Dutch and German nominalize freely, so that corresponding to the verb in (39a) we have the nominal infinitive in (39b).

- (39) a. daß meine Mutter singt  
 that my mother sings  
 'that my mother sings'  
 b. das Singen (meiner Mutter)  
 the singing of-my mother  
 '(my mother's) singing'

He then points out that verb sequences have corresponding complex nominalizations.

- (40) a. daß meine Mutter singen lernen will  
 that my mother sing learn wants-to  
 'that my mother wants to learn to sing'  
 b. das Singen-lernen- wollen (meiner Mutter)  
 the sing learn wanting-to of-my mother  
 '(my mother's) wanting to learn to sing'

Assuming a parallel derivation for nominal infinitives like (39b) and complex nominalizations like (40b), Evers concludes that sequences of verbs like (40a) are complex derived lexical constituents. The structure of the complex nominalization in (40b) is shown in (41).

(41) [<sub>N</sub>[<sub>V</sub>[<sub>V</sub> singen] lernen] wollen]]

Evers fails to observe, however, that verb sequences containing *to*-infinitives have no corresponding nominalizations even though they undergo verb raising. The crucial contrast is between (40b) and (42b).

- (42) a. daß meine Mutter zu singen versuchte  
           that my mother to sing tried  
           'that my mother tried to sing'  
       b. \*das (zu-) singen-versuchen (meiner Mutter)  
           the to sing trying of-my mother  
           '(my mother's) trying to sing'

Thus, the nominalization argument cuts against the verb cluster analysis of verb raising in the case of *to*-infinitives.

Though the grammaticality of bare infinitive nominalizations follows straightforwardly under Evers's treatment, his assumption that (40b) represents the nominalization of a verb cluster is not well founded. This is because the grammaticality of such nominalized forms is also consistent with an alternative analysis of complex nominal infinitives that treats nominalized bare infinitive sequences as lexical compounds of nominalized infinitives. It is well known that German and Dutch bare infinitives nominalize freely without changing form (except orthographically in German).<sup>10</sup>

- (43) a. kleine Katzen oft streicheln  
           small-ACC cats often pet  
           'to pet small cats often'  
       b. das häufige Streicheln kleiner Katzen  
           the frequent petting small-GEN cats  
           'the frequent petting of small cats'

The distinction between the verbal infinitive in (43a) and the corresponding nominal infinitive in (43b) is reflected in the difference in the morphological case that is assigned to the NP argument of the infinitive and in the difference between the adverbial modifier *oft* and its adjectival counterpart *häufig*. As Höhle (1984) notes in discussing these examples, nominal infinitives cannot be modified by adverbs; hence, (44) is ungrammatical.

- (44) \*das oft- Streicheln kleiner Katzen  
           the often petting small-GEN cats  
           (same as (43b))

We attribute these differences between verbal and nominal infinitives to the fact that nominalization affects the categorial feature values of verbal infinitives. Thus, verbal infinitives are specified for the categorial feature values [-N, +V], whereas nominal infinitives are specified for the converse values, [+N, -V]. This change in feature values has the syntactic consequence that nominal infinitives, like other nouns, are unable to assign Case. Thus, (45b) is ruled out by the Case Filter.

- (45) a. die Katzen streicheln  
           the cats-ACC pet  
           'to pet the cats'  
       b. \*das die Katzen Streicheln  
           the the cats-ACC petting  
           'petting the cats'

Whereas the lexical projection of N cannot assign Case, the first phrasal projection of N—namely, N'—is able to assign structural genitive Case and the  $\theta$ -roles of its head to the right, as in (46).

- (46) [<sub>NP</sub> das [<sub>N'</sub> [<sub>N</sub> Streicheln]] der Katzen]  
           the petting the cats-GEN  
           (same as (45b))

The facts for verbs that assign lexical Case (dative or lexically idiosyncratic genitive), like *helfen*, differ from those for *streicheln*. This is because the arguments of such verbs reject structural Case and must receive lexical Case.<sup>11</sup> The arguments of the nominalized infinitives of such verbs inherit this property. Thus, we find the pattern in (47), where (47c) is ungrammatical because structural genitive cannot be assigned to an argument that requires lexical Case.

- (47) a. den Kindern helfen  
           the children-DAT help  
           'to help the children'  
       b. \*das den Kindern Helfen  
           the the children-DAT helping  
           'helping the children'  
       c. \*das Helfen der Kinder  
           the helping the children-GEN  
           (same as (47b))

We assume that nominalization does not affect other syntactic properties of the verbal infinitive, such as its argument structure or the direction of  $\theta$ -role assignment. Thus, we expect, correctly, that the nominalized forms of verbal infinitives with PP arguments will be grammatical since PPs do not require Case.

- (48) a. nach Paris reisen  
to Paris travel  
'to travel to Paris'  
b. das nach-Paris-reisen  
the to Paris traveling  
'traveling to Paris'

We assign the structure in (49) to the nominalization in (48b).

- (49) [<sub>NP</sub> das [<sub>N'</sub> [<sub>PP</sub> nach Paris] [<sub>N</sub> [<sub>V</sub> reisen]]]]

Nominalizations like (50b) are *prima facie* counterevidence to our claim that nouns cannot assign Case to their left.

- (50) a. (kleine) Katzen streicheln  
small cats pet  
'to pet (small) cats'  
b. das (kleine-) Katzen-streicheln  
the small cats petting  
'petting (small) cats'

The contrast between (50b) and (51b) shows, however, that the type of nominalization illustrated in (50b) is distinct from that in (48b).

- (51) a. die kleinen Katzen streicheln  
the small cats pet  
'to pet the small cats'  
b. \*das die-kleinen-Katzen-streicheln  
the the small cats petting  
'petting the small cats'

Nominalizations like (50b) are derived by the morphological incorporation of nonmaximal nominal projections. Since the incorporation of maximal projections is ruled out, as one would expect, (51b) is ungrammatical. Of course, nominal phrases that undergo incorporation do not receive Case, and nominalizations like (52) are therefore ruled out by virtue of the constraint mentioned in connection with (47c), which requires that arguments of verbs that assign lexical Case must receive it.

- (52) \*das (kleinen)-Kindern- helfen  
the small children-DAT helping  
'helping (small) children'

Incorporation is extremely productive in Dutch and German, resulting in derived verbs such as *Karten spielen* 'to play cards' and *Bier trinken* 'to drink beer',<sup>12</sup> and the morphologically complex verbs it creates pattern like simple verbs not only with respect to nominalization, but also with respect to passive. This is shown in (53), where the tensed verb bears singular agreement morphology in the impersonal passive construction, demonstrating that the direct object has not been promoted to subject. This promotion would have been obligatory had incorporation not applied.

- (53) Es wurde oft Karten gespielt, kleine Katzen gestreichelt.  
it was often cards played small cats petted  
'There was frequent card playing, petting of small cats.'

Thus, the internal structure of nominalizations like *Biertrinken* 'beer drinking' or *Kartenspielen* 'card playing', given in (54), is distinct from the PP case in (49).

- (54) [<sub>NP</sub> das [<sub>N'</sub> [<sub>N</sub> [<sub>V</sub> [<sub>N</sub> Bier] [<sub>V</sub> trinken]]]]]]

Nominal infinitives like (49) and (54) are free to undergo morphological incorporation in the lexicon. Thus, under our analysis of bare infinitive nominalizations, the derivation of the nominalizations in (55) is parallel to that of the nominal infinitive *Kartenspielen* from the verbal infinitive *Karten spielen*. The only difference between the two cases is that the incorporated argument in *Kartenspielen* is the underived noun *Karten*, whereas the incorporated nouns in (55) are nominal infinitives derived from verbal infinitives. In the case of (55c), in fact, the incorporated nominal infinitive *Segelschiffe-entwerfen* 'sailboat designing' is itself derived by morphological incorporation of the noun *Segelschiffe*.

- (55) a. dein [<sub>N</sub> [<sub>V</sub> [<sub>V</sub> Singen] [<sub>V</sub> wollen]]]  
your sing wanting-to  
'your wanting to sing'  
b. dein [<sub>N</sub> [<sub>V</sub> [<sub>N</sub> [<sub>PP</sub> nach- Paris] [<sub>N</sub> [<sub>V</sub> reisen]]] [<sub>V</sub> wollen]]]  
your to Paris travel wanting-to  
'your wanting to travel to Paris'  
c. dein [<sub>N</sub> [<sub>V</sub> [<sub>N</sub> [<sub>V</sub> Segelschiffe] [<sub>V</sub> entwerfen]]] [<sub>V</sub> müssen]]]  
your sailboats design having-to  
'your having to design sailboats'

The recursive application of incorporation can give rise to even more complex bare infinitive nominalizations such as the one in (40).

In the Dutch counterpart of (40), both the order of the verbs in the verb sequence and that of the nominalized infinitives in the corresponding bare infinitive nominalization are mirror images of the German order.

- (56) a. dat mijn moeder wil leren zingen  
that my mother wants-to learn sing  
(same as (40a))  
b. het willen- leren-zingen (van mijn moeder)  
the wanting-to learn sing of my mother  
(same as (40b))

We attribute the parallel order of the verbs in (56a) and the constituents of the nominalized form in (56b) to the fact that the nominalized infinitives in (56b) inherit the direction in which they assign  $\theta$ -roles from the underlying verbal infinitives in (56a). If we assume with Baltin (1989) that subcategorization is for heads rather than for maximal projections and extend his idea to say that  $\theta$ -roles are also assigned to heads, then it is not surprising that the word order in the nominalization and the sentence are the same in (56).<sup>13</sup>

The analysis of bare infinitive nominalizations that we have just presented is consistent with the existence of verb sequences that have no corresponding nominalizations. Such verb sequences occur in German and very marginally in Dutch as a result of a rule of syntactic lowering. This rule moves quantified or emphatically stressed NPs into the VP. We illustrate syntactic lowering for simple clauses in (57b) and (58b).

- (57) a. daß Hans allen Kindern das Buch zeigte  
that Hans to-all children the book showed  
'that Hans showed the book to all the children'  
b. daß Hans das Buch allen Kindern zeigte  
that Hans the book to-all children showed  
(same as (57a))  
(58) a. daß keiner dem Hans das Buch gab  
that nobody to-the Hans the book gave  
'that nobody gave the book to Hans'  
b. daß dem Hans das Buch keiner gab  
that to-the Hans the book nobody gave  
(same as (58a))

Quantifier lowering is also possible in clauses in which verb raising has

applied. We show this in (59) and (60), using an exceptional German sentence type in which the tensed verb occurs as the first verb in the verb sequence. Such sentences are one where modal verbs appear in a perfect tense, as in (59a) and (60a).<sup>14</sup> We return to these sentences in section 3.5 for other purposes. For the moment, however, their significance lies in the fact that the tensed verb delimits the sequence of verbs. As in the simple clause (58b), the subject of a clause in these sentences can occur inside the VP when stressed, as in (60b). In addition, it can occur inside the sequence of verbs, as in (60c).

- (59) a. daß Hans Kindern das Buch hätte zeigen wollen  
that Hans to-children the book would-have show want-to  
'that Hans would have wanted to show the book to children'  
b. daß Hans das Buch Kindern hätte zeigen wollen  
that Hans the book to-children would-have show want-to  
(same as (59a))  
c. daß Hans das Buch hätte Kindern zeigen wollen  
that Hans the book would-have to-children show want-to  
(same as (59a))  
(60) a. daß keiner gestern hätte kommen dürfen  
that nobody yesterday would-have come be-allowed-to  
'that nobody would have been allowed to come yesterday'  
b. daß gestern keiner hätte kommen dürfen  
that yesterday nobody would-have come be-allowed-to  
(same as (60a))  
c. daß gestern hätte keiner kommen dürfen  
that yesterday would-have nobody come be-allowed-to  
(same as (60a))

In contrast to the verb sequences in (59c) and (60c), the corresponding nominalizations are completely unacceptable.<sup>15</sup>

- (61) a. \*dieses ewige Haben-Kindern-zeigen-wollen (des Buches)  
this eternal having to-children show want-to of-the book  
'this constant having wanted to show children (the book)'  
b. \*dieses ewige Haben-keiner-kommen-dürfen  
this eternal having nobody come be-allowed-to  
'this constant nobody having been allowed to come'

Under our analysis of bare infinitive nominalizations, the nominalized forms in (61) are both ruled out because the NP arguments fail to receive

Case from the nominal infinitives *zeigen* and *kommen* and because they cannot be derived by incorporation.<sup>16</sup>

Finally, our analysis of bare infinitive nominalization, in contrast to a verb cluster analysis, is consistent with the following facts from Swiss German (Henk van Riemsdijk, personal communication). Swiss German expresses the progressive aspect by means of the construction illustrated in (62), in which the copula is followed by the fused form *am* 'at-the' and a nominal infinitive.

- (62) Er isch am ruedere.  
 he is at-the row  
 'He is rowing.'

The nominal infinitive need not be morphologically simple as it is in (62); rather, it can also be the nominalization of a verb derived by noun incorporation, as in (63a), or the nominalization of a bare infinitive sequence, as in (63b).

- (63) a. Er isch am klavierspile.  
 he is at-the piano-play  
 'He is playing piano.'  
 b. Er isch am leere ruedere/autofaare.  
 he is at-the learn row car-drive  
 'He is learning to row/to drive a car.'

The facts in (62) and (63), in particular those in (63b), are consistent with a verb cluster analysis as well as with our analysis of bare infinitive nominalization. However, the two analyses make different predictions concerning the progressive of sentences in which verb projections are raised. Consider (64).

- (64) das er wil leere s auto repariere  
 that he wants-to learn the car repair  
 'that he wants to learn to repair the car'

We have seen in section 2.1 that the variant of the verb cluster analysis proposed by Haegeman and Van Riemsdijk would treat the sequence *leere s auto repariere* as a derived lexical constituent in a way parallel to the bare infinitive sequences *leere ruedere* and *leere autofaare* in (63b). The same is true of an alternative extension of the verb cluster analysis to verb projection raising proposed by Den Besten and Edmondson (1983), which we discuss in more detail in section 4.1. Under these analyses, one might therefore expect the progressive of the bare infinitive sequence in (64) to be grammatical. Under our nominal-compounding analysis, on the other

hand, the progressive construction in question is predicted to be ungrammatical. This is because the status of *s auto* as a maximal projection prevents *s auto repariere* from being derived as a morphologically complex verb by noun incorporation. As a result, *s auto repariere* is unable to undergo nominalization and subsequent compounding with *leere*. As shown in (65), it is the prediction of the nominal-compounding analysis that is borne out.<sup>17</sup>

- (65) \*Er isch am leere s auto repariere.  
 he is at-the learn the car repair  
 'He is learning to repair the car.'

### 3.2 Sentence Negation

Evers's intuitively most appealing argument for the verb cluster is based on the position of *nicht* 'not' as a sentence negator. Objecting to the notion that negation can take scope over higher clauses from inside an embedded clause, Evers (1981:100) notes that "[t]he verb of the deepest embedded sentence [is] a strange place to negate the matrix structure." He observes further that sentence negation in clauses containing nonextraposed complements cannot occur immediately preceding the tensed verb.<sup>18</sup>

- (66) a. daß meine Mutter dem Mann das Buch nicht geben will  
 that my mother to-the man the book not give wants-to  
 'that my mother does not want to give the man the book'  
 b. \*daß meine Mutter dem Mann das Buch geben nicht will  
 that my mother to-the man the book give not wants-to

From this, he concludes that negative operators like *nicht* are matrix constituents that precede the verb cluster. In order to maintain Evers's conclusion, given the collapse of the clause-pruning hypothesis, one would need to assume that in cases like (6b), repeated here as (67), the PP *mit Verspätung* undergoes string-vacuous incorporation into the verb cluster.

- (67) daß ich die Arbeit nicht mit Verspätung einzureichen wage  
 that I the paper not with delay in-to-hand dare  
 'that I do not dare to hand in the paper late'

Though it is true that PPs can occur within the sequence of verbs in many varieties of West Germanic, including standard German, the verb sequence in standard German and Dutch cannot in general contain NP arguments. Therefore, the example in (68) shows clearly that *nicht* can take matrix scope from within the lowest embedded clause.<sup>19</sup>



- (68) daß meine Mutter dem Mann nicht das Buch geben will  
 that my mother to-the man not the book give wants-to  
 (same as (66a))

Note further that negation in (7), repeated here as (69), takes scope over the clause containing *müssen* even though *nicht* precedes the most deeply embedded verb *essen* and not *müssen*.

- (69) daß Julia ihren Spinat nicht essen zu müssen versucht  
 that Julia her spinach not eat to have-to tries  
 'that Julia is trying not to have to eat her spinach'

We attribute the unacceptability of (66b) to the fact that *nicht* originated historically as a morphologically complex negative element that occupied an argument position within the VP, just as *not* did in English. But whereas *not* in Modern English has come to be a true sentence negator associated with INFL, *nicht* continues to behave syntactically in a way that reflects its historical origin. Thus, although *nicht* is morphologically simple from the synchronic point of view, its scope behavior is parallel to that of the morphologically complex *nothing*; that is, it is a constituent of VP and undergoes quantifier raising, as we saw in section 2.1. In Old English, on the other hand, where sentence negation was expressed by the precursor of *not*, the morphologically simple sentence-negating proclitic *ne*, sentence negation immediately precedes the matrix verb in a clause-final verb sequence, as in (70) (Van Kemenade 1985).

- (70) thæt nan hæthen cyning ær gedon ne dorste  
 that no heathen king before do not dared  
 'that no heathen king had dared to do before'

### 3.3 Gapping

Evers (1975) notes that gapping affects sequences of verbs in the same way as it does simple verbs and concludes from this fact that verb sequences are lexical constituents of category V.

- (71) a. daß Hans Gedichte schreibt und Heike Romane  
 that Hans poems writes and Heike novels  
 'that Hans writes poems and Heike novels'  
 b. daß Hans Gedichte zu schreiben beginnen wird und Heike  
 that Hans poems to write begin will and Heike  
 Romane  
 novels  
 'that Hans will begin writing poems and Heike novels'

This argument assumes that the possibility of gapping reliably indicates the status of a string as a constituent. But as Evers himself points out, gapping can delete discontinuous strings like *bei diesem Tanz ... schaute*.

- (72) daß Hans bei diesem Tanz zu mir schaute und ich zu ihm  
 that Hans at this dance to me looked and I to him  
 'that Hans looked at me during this dance and I at him'

We know that the VP in (72) has the binary-branching structure [*bei diesem Tanz [zu mir [schaute]]*] and that the deleted sequence *bei diesem Tanz schaute* is not a constituent since permuting the order of the PPs *bei diesem Tanz* and *zu mir* results in the ungrammatical sequence \**daß Hans zu mir bei diesem Tanz schaute*.

Thus, gapping in German, as in English, does not always delete constituents. Indeed, in English gapped sentences, the deletion of nonconstituent sequences like *will sing* in (73a) is generally more natural than the deletion of only parts of such sequences, even when the deleted elements are constituents.

- (73) a. John will sing the recitativos and Mary the arias.  
 b. ?John will sing the recitativos and Mary may the arias.  
 c. ?John will sing the recitativos and Mary play the harpsichord.

Even if gapping were constrained to delete constituents, however, the verb cluster hypothesis would give rise to incorrect predictions concerning the deletion of substrings of the verb sequence. Consider (74), where the bracketing indicates the derived constituent structure of the verb sequence under the verb cluster hypothesis.

- (74) daß Hans Gedichte [[[schreiben] können] möchte]  
 that Hans poems write be-able would-like  
 'that Hans would like to be able to write poems'  
 a. \*... und Heike Romane muß  
 and Heike novels has-to  
 and Heike has to novels'  
 b. ... und Heike Filme drehen  
 and Heike films turn  
 and Heike to make films'

Under the assumption that gapping deletes constituents, the verb cluster hypothesis leads one to expect that deleting the sequence *schreiben können*, which forms a derived constituent, should be preferable to deleting the nonconstituent sequence *können möchte*. But this prediction is not borne out; and in fact, as we indicated in (74), the actual acceptability pattern of

the sentences produced by deleting these sequences is precisely the reverse of that expected under the verb cluster hypothesis.

### 3.4 Coordination

Evers (1981) argues that sequences of verbs behave like simple verbs with respect to what he terms emphatic coordination.

- (75) a. daß wir die Kinder entweder hören oder sehen  
that we the children either hear or see  
'that we either hear or see the children'  
b. daß wir die Kinder entweder tanzen sehen oder singen hören  
that we the children either dance see or sing hear  
'that we either see the children dance or hear them sing'

Moreover, he claims that emphatic coordination on matrix verbs is not acceptable.

- (76) \*daß wir die Kinder tanzen entweder sehen oder hören  
that we the children dance either see or hear  
'that we either see or hear the children dance'

This argument is unsatisfactory in at least two respects. First, the German and Dutch sentences in (77) are incorrectly ruled out.<sup>20</sup>

- (77) a. daß wir die Kinder entweder spielen oder tanzen sehen werden  
that we the children either play or dance see will  
'that we will see the children either play or dance'  
b. dat we de kinderen ofwel kunnen ofwel moeten zien spelen  
that we the children either be-able or have-to see play  
'that we are either can or must see the children play'

Second, the argument depends on the assumption that the possibility of coordination is evidence that the conjoined strings are constituents. That this assumption is not valid is shown by sentences such as (78), where there is no reason to believe that the sequence consisting of the indirect and the direct object forms a constituent.<sup>21</sup>

- (78) Hans wird entweder Heike das Buch oder Bernd die Platte schenken.  
Hans will either Heike the book or Bernd the record give  
'Hans will either give Heike the book or Bernd the record.'

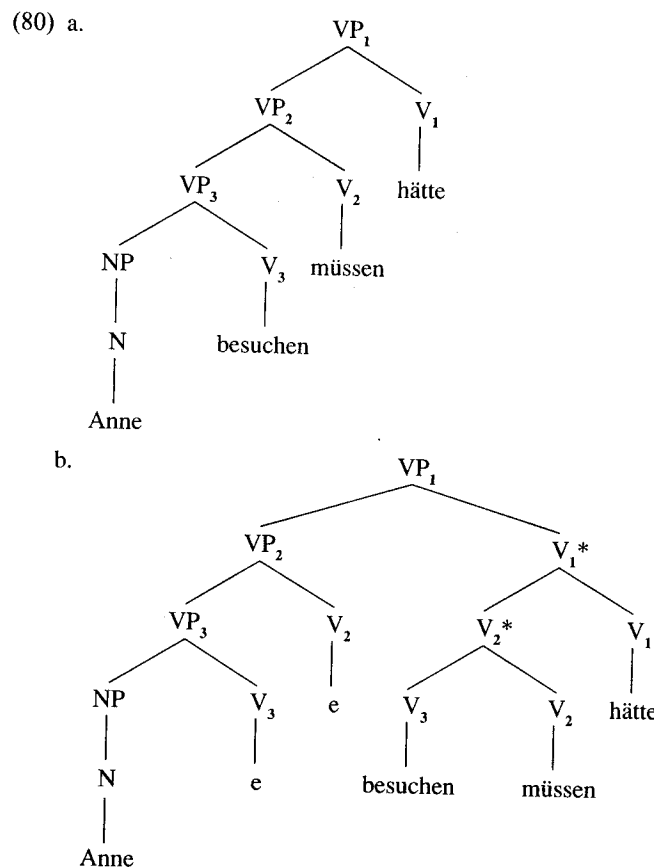
### 3.5 Word Order

Den Besten and Edmondson (1983) present an argument for the verb cluster based on the standard German word order illustrated in (79), which

we mentioned above in connection with the quantifier-lowering examples in (59) and (60).

- (79) daß ich Anne hätte besuchen müssen  
that I Anne would-have visit have-to  
'that I would have had to visit Anne'

According to their analysis, the order of the verbs in (79) is the result of a stylistic inversion rule that permutes the two immediate constituents of the verb cluster. The underlying and derived structures they assign to the verb sequence in (79) are shown in (80);  $V_2^*$  and  $V_1$  are the constituents that permute.



In other varieties of West Germanic—for instance, in Swiss German—the mirror image of  $V_1 V_3 V_2$  verb sequences occurs. Such sequences can be

derived by inverting the immediate constituents of  $V_2^*$ , yielding the word order in (81) (Lötcher 1978).

- (81) wil er en gsee choo hät (Swiss German)  
 since he him see come has  
 'since he saw him come'

However, Den Besten and Edmondson's inversion analysis of the verb orders in (79) and (81) is open to the objection that the permutation of constituents of morphologically complex lexical items is an otherwise unparalleled phenomenon in West Germanic, if not universally. Moreover, they fail to note that there are two actually occurring verb sequences that cannot be derived by inverting (sub)constituents of the verb cluster. These are the  $V_2 V_1 V_3$  sequence in (82), which is possible in Swiss German, and its mirror image in (83), which occurs generally in Southern German dialects—for example, in Franconian (Lötcher 1978).<sup>22</sup>

- (82) wo s aagfange hät rägne (Swiss German)  
 when it started has rain  
 'when it started to rain'
- (83) daß er singen hat müssen (Franconian)  
 that he sing has have-to  
 'that he had to sing'

#### 4 A Syntactic Analysis of Verb Raising

##### 4.1 The Uniform Derivation Hypothesis

We have demonstrated that the arguments that have been advanced in favor of the verb cluster are either incorrect or inconclusive. The evidence that we have presented shows clearly that verb raising must be syntactic in the case of *to*-infinitives. First, nominalizations of *to*-infinitives are ungrammatical. Second, it appears from a survey of cross-linguistic facts that verb incorporation occurs only with modals, causatives, and perception verbs—that is, with verbs that subcategorize for VPs or small clauses rather than for  $S'$ -complements (Baker 1988).<sup>23</sup> If this restriction is correct, then the raising of *to*-infinitives cannot be an instance of morphological incorporation, since *to*-infinitives undergo raising freely despite the fact that they originate in  $S'$ -complements in underlying structure. In the case of bare infinitive raising, the empirical evidence from nominalization and clitic placement in standard Dutch and German is consistent with either a morphological incorporation analysis or a purely syntactic treatment. In this paper we will adopt what we will refer to as the *uniform derivation*

*hypothesis*; that is, the hypothesis that verb raising is a syntactic process that affects bare infinitives and *to*-infinitives in a parallel manner. This hypothesis is attractive since it results in a unitary analysis of the word order facts in those varieties of West Germanic that exhibit verb raising. If it should turn out, however, that the proper analysis of bare infinitive raising involves the formation of a derived lexical constituent in the syntax, the TAG analysis that we present will have to be revised to take advantage of an extension of the TAG formalism that is independently motivated by facts concerning extraposition (Kroch and Joshi 1987), and we would be led to formulate an analysis of bare infinitive raising similar to that proposed by Heycock (1987) for the Japanese causative construction, which clearly is morphological in our sense.

Comparative evidence for the uniform derivation hypothesis comes from the possibility of verb projection raising in many varieties of West Germanic (Lötcher 1978; Den Besten and Edmondson 1983). Thus, West Flemish and Swiss German permit bare infinitive constructions like those in (84) and (85), respectively.

- (84) En ge zoudt nog moeten uw eigen pintje betalen.  
 and you would yet have-to your own beer pay  
 'And you would even have to pay for your own beer.'
- (85) a. Mer händ em Hans welen es velo schänke.  
 we have to-the Hans want-to a bike give  
 'We wanted to give Hans a bike.'
- b. Mer händ welen em Hans es velo schänke.  
 we have want-to to-the Hans a bike give  
 (same as (85a))

In order to account for these facts, Den Besten and Edmondson (1983) suggest that the projection level to which verb raising applies varies parametrically across dialects. In both West Flemish and Swiss German, the projection dominating the verb and its direct object can be raised, in contrast to standard Dutch, which permits only the raising of the verb itself. In Swiss German, in addition, the entire VP can become part of the verb sequence. Den Besten and Edmondson then extend the verb cluster analysis to the phrasal raising constructions in (84) and (85). Their treatment results in a lexical constituent, the verb cluster, that dominates a phrasal projection of V. Since such constituents, which are anomalous with regard to X-bar theory, are not required elsewhere in West Germanic and since a syntactic analysis of verb raising is available, as we will show, the verb cluster analysis of verb projection raising results in an unwarranted

weakening of the constraints on possible phrase structures in Dutch and German.<sup>24</sup>

It might be objected that what appear to be phrasal projections of V in (84) and (85) are in fact complex lexical items derived by the process of morphological incorporation discussed in section 3.1. The constituents dominated by the verb cluster would then be morphologically complex lexical constituents, rather than phrases. There are two difficulties with this attempt to salvage a morphological analysis of verb projection raising. First, the sequences *uw eigen pintje betalen* and *es velo schänke* in (84) and (85) cannot be derived by incorporation since they contain maximal projections. Second, treating the sequence of verbs in (85b) as a lexically derived complex verb additionally violates the constraint mentioned in connection with (47c)—namely, that arguments of verbs that assign lexical Case must receive it—since *em Hans*, if incorporated, would not receive lexical dative Case. Thus, our revision of Den Besten and Edmondson's incorporation analysis of verb projection raising fares no better than their original proposal. We conclude that only a syntactic analysis of the verb-raising construction is able to capture that parallelism between lexical and phrasal raising in those dialects that allow verb projection raising and to provide a unitary analysis of bare infinitive raising across dialects.

Den Besten and Edmondson (1983:199f.) note that “[i]n 17th century Dutch ... direct objects (but not indirect objects) could be incorporated into verb raising.” This is just the situation in modern West Flemish. Over the past three centuries, standard Dutch has innovated in comparison to West Flemish by gradually restricting verb raising to lexical projections of V. A similar development has taken place in standard German, where we find verb projection raising in the Early New High German of Luther:

- (86) Die Mutter hätte nicht gedurft den Namen tragen.  
 the mother would-have not been-allowed-to the name bear  
 ‘The mother would not have been allowed to bear the name.’

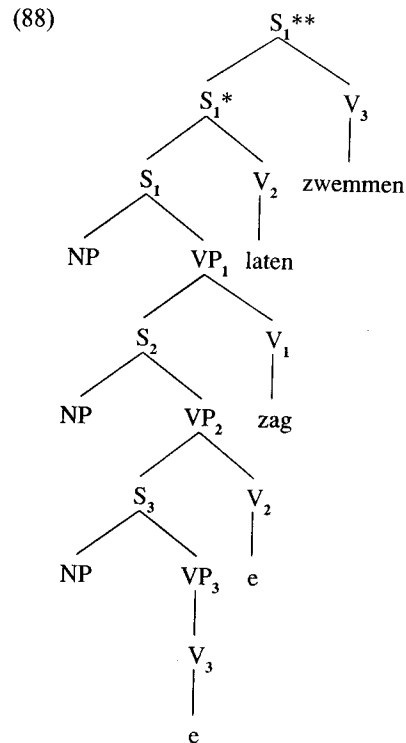
We interpret the graduality of the historical drift toward the raising of smaller verbal projections as evidence for the unitary nature of phrasal and lexical bare infinitive raising, and hence for the conceptual desirability of a syntactic analysis of all bare infinitive raising.

#### 4.2 Verb Raising as Infinitive Extraposition

Having adopted the uniform derivation hypothesis, we now address the problem of constructing a syntactic treatment of verb raising. Zaenen (1979) presents a syntactic analysis consistent with the evidence we have

given, under which verb raising in short verb sequences (those consisting of two verbs) is the result of a process of infinitive extraposition.<sup>25</sup> If we extend her proposal to longer verb sequences such as the one in (2a), repeated here as (87), we predict the existence of derived structures like (88), where the S-nodes marked by asterisks are nodes resulting from Chomsky-adjunction.

- (87) dat Jan Piet Marie zag laten zwemmen  
 that Jan Piet Marie saw make swim  
 ‘that Jan saw Piet make Marie swim’



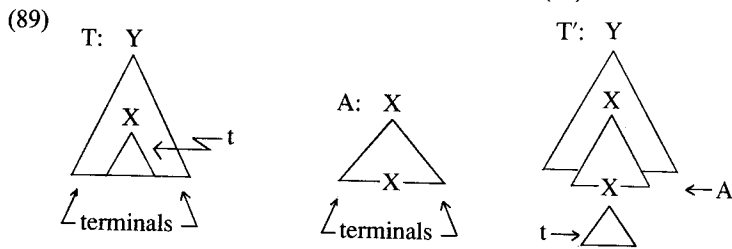
We assume that the untensed complement clauses  $S_2$  and  $S_3$  do not represent bounding nodes for Subjacency (Rizzi 1982); hence, the infinitives *laten* and *zwemmen* can be extraposed directly to  $S_1$  and  $S_1^*$  to give the desired  $V_1 V_2 V_3$  order.

In the remainder of this paper we present two alternative instantiations of Zaenen's treatment of verb raising as infinitive extraposition, using the tree-adjoining grammar (TAG) formalism of Joshi, Levy, and Takahashi

(1975) and Joshi (1983).<sup>26</sup> Since the TAG formalism may be unfamiliar to many readers, we will first give a brief description of it before we present the two linguistic analyses that it makes possible. For a more detailed introduction to the formalism, we refer the reader to Joshi 1983 and Kroch and Joshi 1985. The linguistic relevance of the TAG formalism is discussed extensively in Kroch and Joshi 1985, 1987 and in Kroch 1987, 1989.

### 4.3 The TAG Formalism

The fundamental linguistic insight on which the TAG formalism is based is that local cooccurrence relations can be factored apart from the expression of recursion and unbounded dependencies. A TAG consists of a set of elementary trees on which local dependencies are stated and an adjunction operation, which composes elementary trees with one another to yield complex structures. In order to avoid confusion with the notion of adjunction familiar from Government-Binding Theory, we will make a terminological distinction between Chomsky-adjunction and tree-adjunction (or tree-adjoining). The elementary trees of a TAG are divided into initial trees and auxiliary trees, whose forms are illustrated in (89).



Initial trees have the form of the left-hand tree T. The root node of an initial tree is labeled S or S', its internal nodes are all phrasal categories, and its frontier nodes are all lexical categories. Auxiliary trees have the form of the center tree A. The root node of an auxiliary tree is a phrasal category, which we have labeled X. Its frontier nodes are all lexical nodes except for one phrasal node that bears the same category label as the root node.

We now define tree-adjunction as follows. Let T be an elementary tree with a nonterminal node labeled X, and let A be an auxiliary tree with a root node X. By definition, A will also have a foot node X. Tree-adjoining the auxiliary tree A at the node X of the elementary tree T then consists of the following steps.

1. The subtree of T dominated by X, t in (89), is excised, leaving behind a copy of its parent node X.

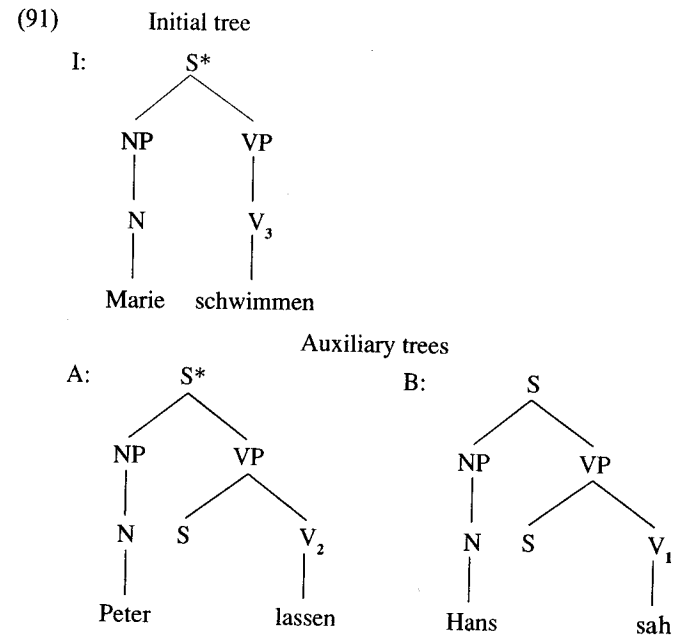
2. The auxiliary tree A is attached at X, and its root node is identified with the node X at which it attaches.
3. The subtree t is attached to the foot node of the auxiliary tree, and the node X that dominates t is identified with the foot node X of the auxiliary tree.

Thus, the result of tree-adjoining the auxiliary tree A in (89) at the node X of the initial tree T is the right-hand tree T'.

Using the TAG formalism, we can easily derive the German verb-raising examples in (1). For reasons of space, we illustrate only the derivation of (1a), repeated here as (90).

- (90) daß Hans Peter Marie schwimmen lassen sah  
 that Hans Peter Marie swim make saw  
 'that Hans saw Peter make Marie swim'

The derivation requires the initial tree and the two auxiliary trees in (91). Again, we omit S', COMP, and INFL nodes to simplify the representation. Note carefully that the initial tree in (91) represents a special case of T in (89), namely, the case where Y and X coincide.

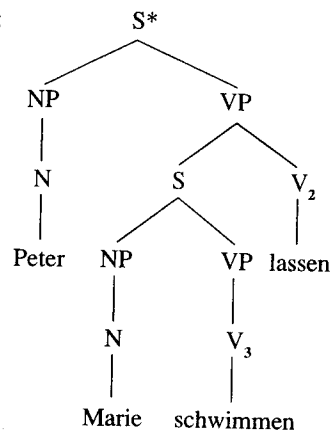


The sentence in (90) is derived by tree-adjoining the first auxiliary tree, A, at the designated node S\* in the initial tree I, yielding A' in (92). The second

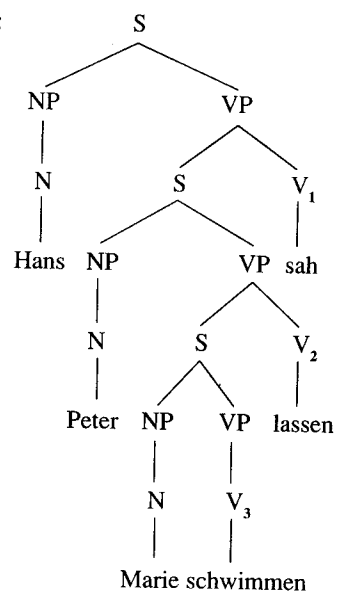
auxiliary tree, B, is then adjoined at the node S\* in the subtree A of A', yielding B'. Since tree-adjunction takes place at the root nodes of I and A, tree-adjunction here reduces to substitution; this is not the case in general, however.

(92)

A':



B':



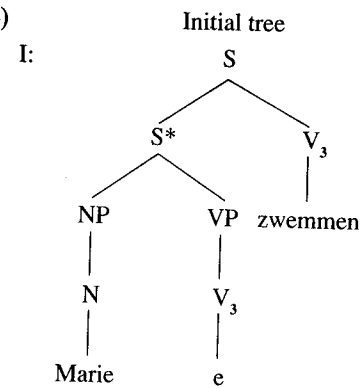
In order to derive the Dutch word order in (2), it is necessary to use elementary trees of a slightly different form—namely, ones in which an infinitive is extraposed and Chomsky-adjoined to the clause containing it. We will refer to such trees as trees with links, where *link* refers to the relationship between an empty category and the Chomsky-adjoined antecedent that binds it. The elementary trees required to derive (2a), repeated here as (93), are given in (94); they may be thought of as having been derived from the Dutch trees corresponding to the German ones in (91) by extraposing the infinitive verb.<sup>27</sup>

- (93) dat Jan Piet Marie zag laten zwemmen  
 that Jan Piet Marie saw make swim  
 'that Jan saw Piet make Marie swim'

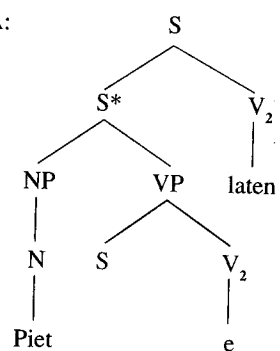
We follow Zaenen (1979) in assuming that only infinitives undergo extraposition; hence, the tensed verb in the second auxiliary tree, B, is not coindexed with a trace. But this is not dictated by the TAG formalism, and

the Dutch word order in (93) could be derived by using auxiliary trees in which the tensed verb is extraposed as well.

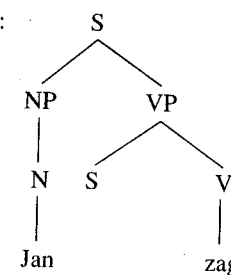
(94)



A:

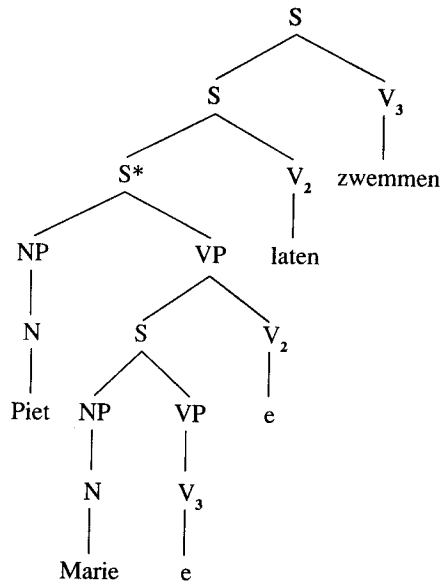


B:

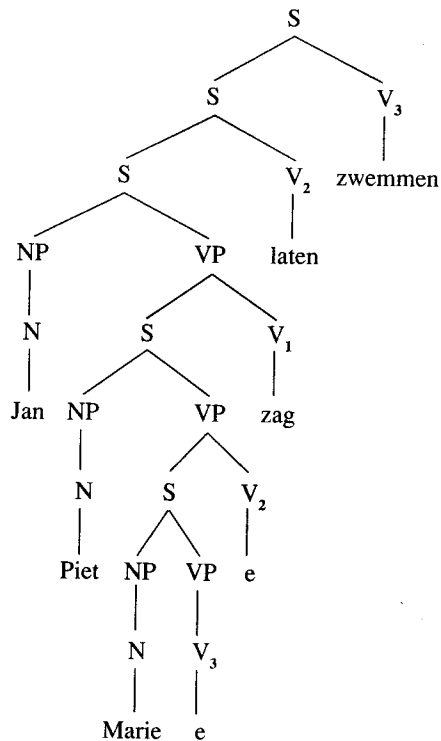


The derivation of (93) proceeds by tree-adjoining the auxiliary tree A at the designated node, S\*, in the initial tree, and tree-adjoining B at S\* in the subtree A of A'. Note that the derived constituent structure of the right-hand tree in (95) is identical to that in (88).

(95) A':



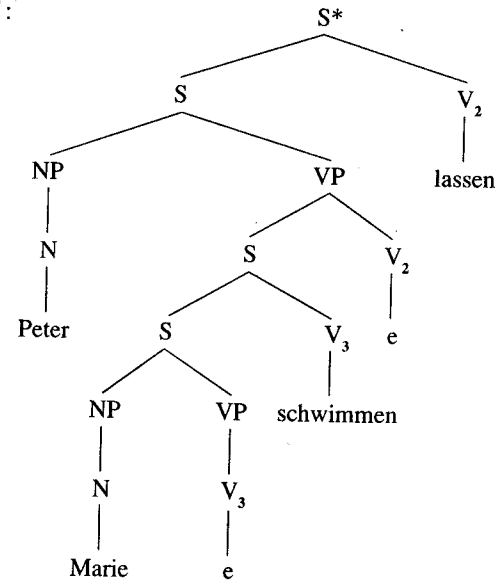
B':

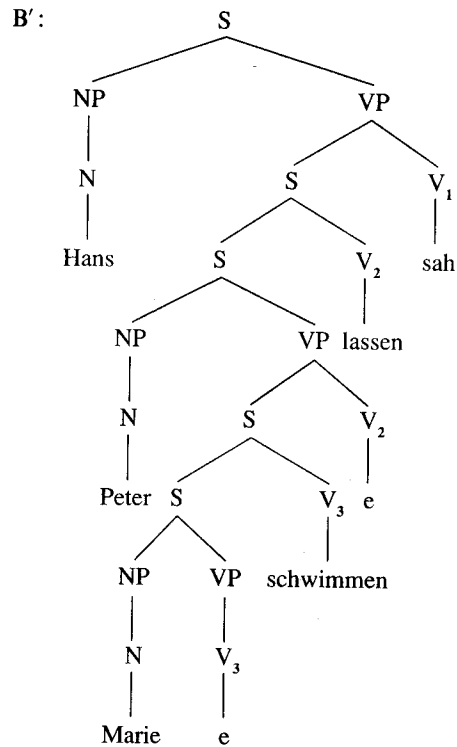


4.4 The String-Vacuous Raising Hypothesis

Except for the tree that contains that matrix verb, the elementary trees in (94) each have two structurally adjacent S-nodes. The derivation of Dutch verb sequences requires that each auxiliary tree be tree-adjoined at the lower S-node. It is formally possible in a TAG to derive the German verb sequences in (90) using trees that are structurally identical to those in (94) if one performs tree-adjunction at the higher S-node. Such a treatment instantiates a linguistic analysis under which German exhibits string-vacuous verb raising; thus, although it is a syntactic analysis, it reconstructs an important aspect of the verb cluster analysis. The trees resulting from the adjunction of A and B at the higher S-nodes in (94) (given the appropriate lexical changes) are given in (96) as A' and B', respectively.

(96) A':



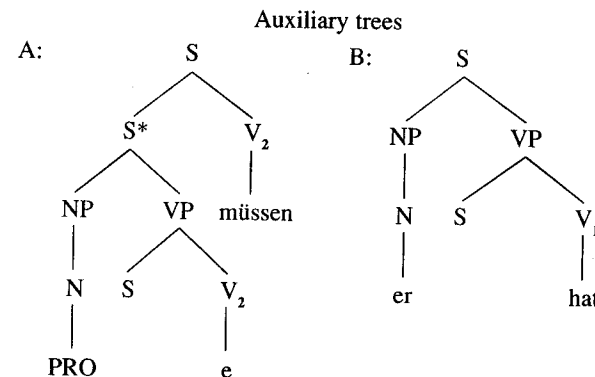
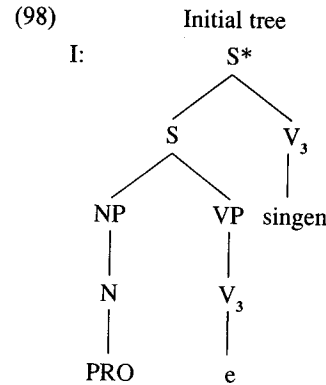


We will refer to the hypothesis that trees with links, as in (94), are used to derive verb-raising sentences in both German and Dutch as the *string-vacuous raising hypothesis*. According to this hypothesis, the difference between the two languages is reducible to a general constraint against tree-adjunction at the higher or lower of two structurally adjacent S-nodes in standard Dutch and German, respectively.<sup>28</sup> This constraint is the TAG equivalent of the constraint that governs the direction of Chomsky-adjunction under Den Besten and Edmondson's incorporation analysis of the verb cluster.

Verb sequences other than the standard German and Dutch ones illustrated in (90) and (93), respectively, can then be derived by relaxing this constraint. Consider the Franconian word order illustrated in (83) and repeated here as (97).

- (97) daß er singen hat müssen  
 that he sing has have-to  
 'that he had to sing'

The string-vacuous raising hypothesis requires the extraposition of *singen* in the initial tree. The form of the initial tree and the nature of tree-adjunction then dictate that modals must be lexically inserted into trees in which they govern clausal complements, just as in Haegeman and Van Riemsdijk's analysis. The trees that are required are given in (98).



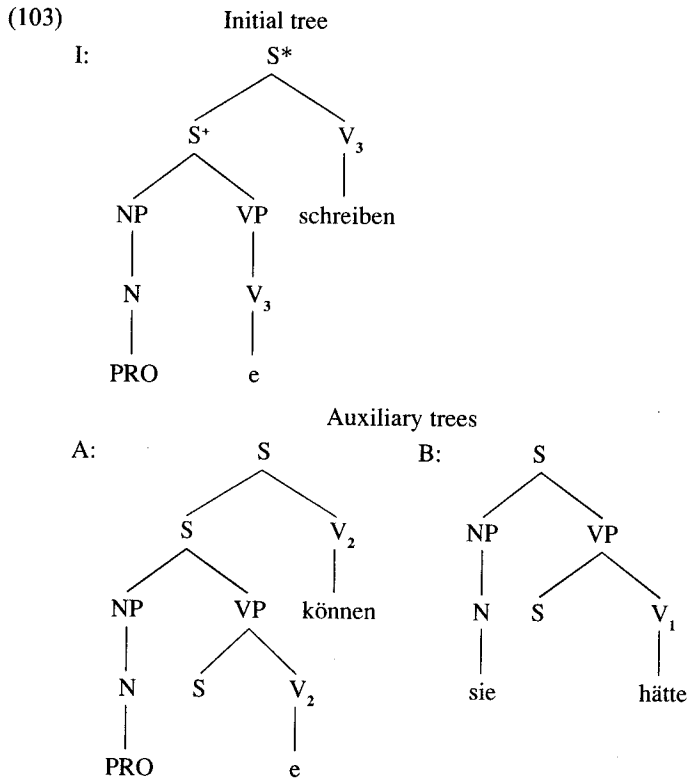
The derivation of (97) is shown in (99). The first and second auxiliary trees adjoin at the higher S-node of I and the lower S-node of A, respectively. We continue to omit S'-nodes to simplify the representation; hence, PRO is only apparently governed in the structures in (99).





(102) daß sie hätte schreiben können  
 that she would-have write be-able  
 'that she could have written'

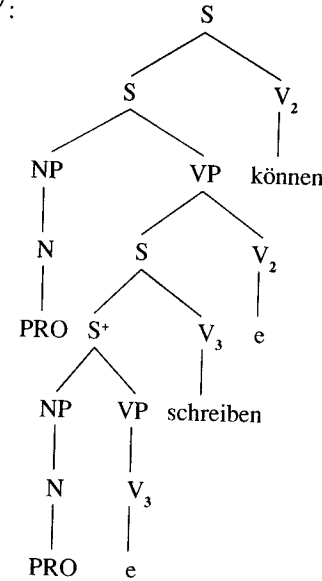
The trees required in the derivation of (102) are given in (103).



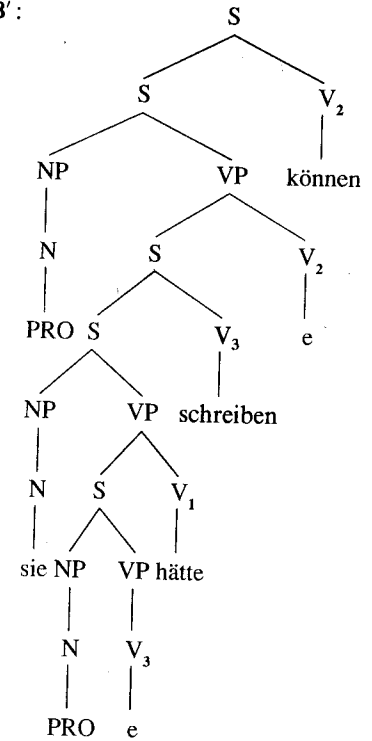
The auxiliary trees in (103) are simultaneously adjoined into the initial tree, with A and B adjoining at the higher and lower S-node, respectively. We illustrate the derivation of (102) in (104). For expository reasons, we present the derivation as if the adjunction of A into the initial tree preceded that of B.

(104)

A':



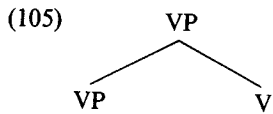
B':



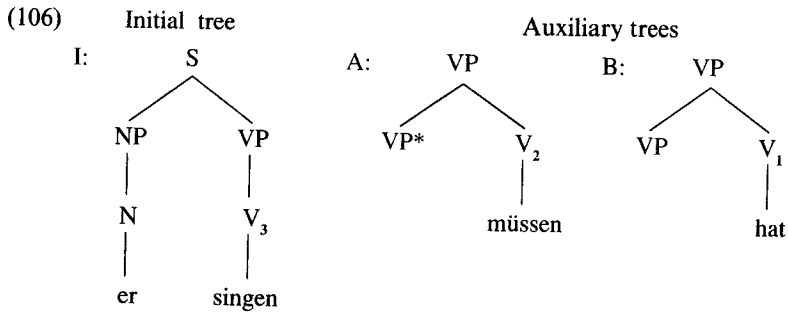
The implausibility of the derived structure in (104), in which the PRO subject of *können* c-commands its antecedent *sie*, leads us to reject the string-vacuous raising hypothesis.

#### 4.5 An Analysis without String-Vacuous Verb Raising

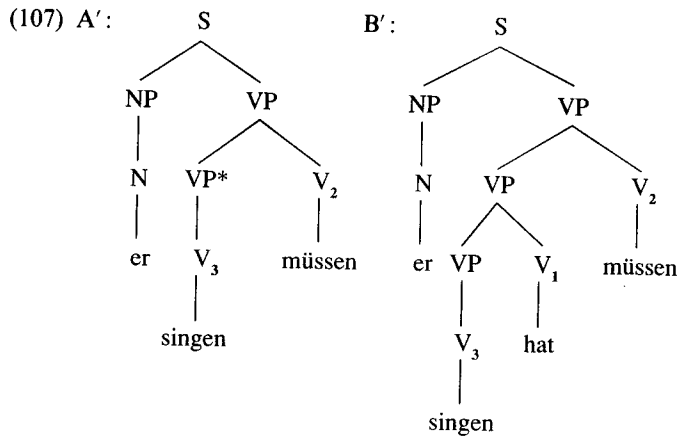
We now present a TAG analysis of verb raising that is based on the assumption that there is no string-vacuous verb raising. This assumption has the formal consequence in a TAG that neither  $V_3 V_1 V_2$  verb sequences nor their mirror image can be derived if modals are analyzed as subcategorizing for clausal complements. We therefore follow Den Besten and Edmondson (1983) in assuming that modals subcategorize for VP complement; accordingly, they are inserted into auxiliary trees with VP roots like the one in (105).



The Franconian example in (97) can then be derived using the elementary trees in (106).

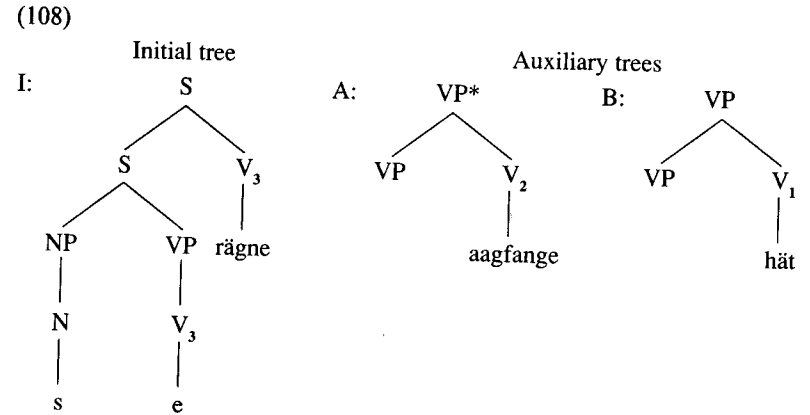


The first auxiliary tree adjoins at the VP-node of the initial tree to yield A', and the second auxiliary tree adjoins at the lower VP of the subtree A in A'.

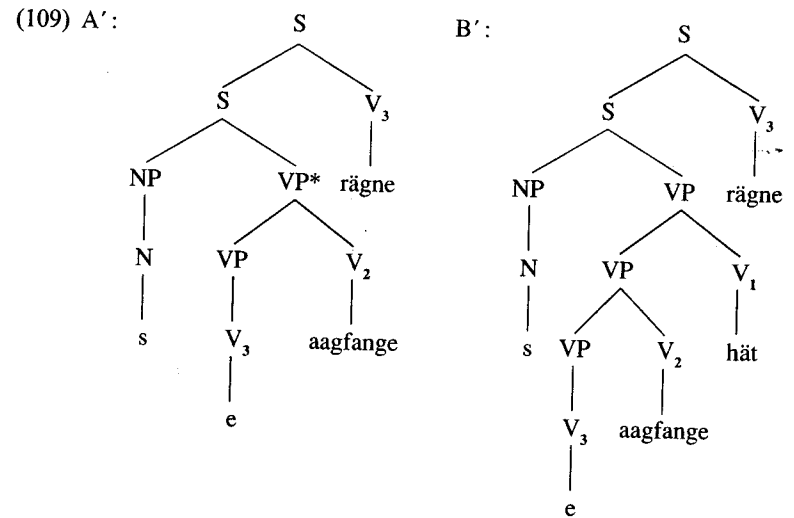


In certain varieties of Southern German, the word order corresponding to that in (97) is *singen müssen hat* (Den Besten and Edmondson 1983:182). Our TAG analysis reflects the minimal difference between the sequence without verb raising and the one in (97) quite simply: the sequence without verb raising is derived by using the same trees as in (106), but by adjoining the second auxiliary tree at the higher VP-node of A in A'.

The derivation of the Swiss German word order in (100) requires an initial tree with a link, corresponding to the extraposition of *rägne*, the infinitive complement of *aagfange*.



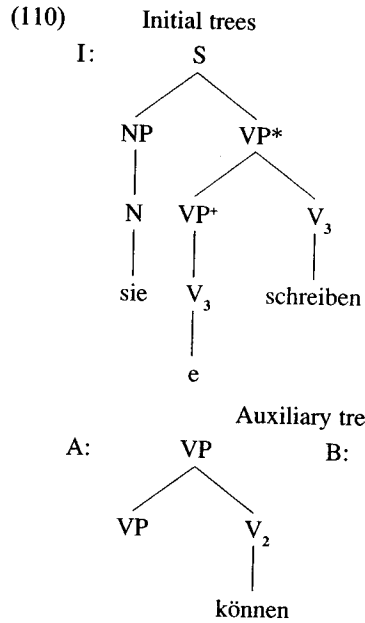
The first auxiliary tree, A, adjoins at the VP of the initial tree, and the second auxiliary tree, which contains the matrix verb, then adjoins at the higher VP-node of the subtree A in A'.



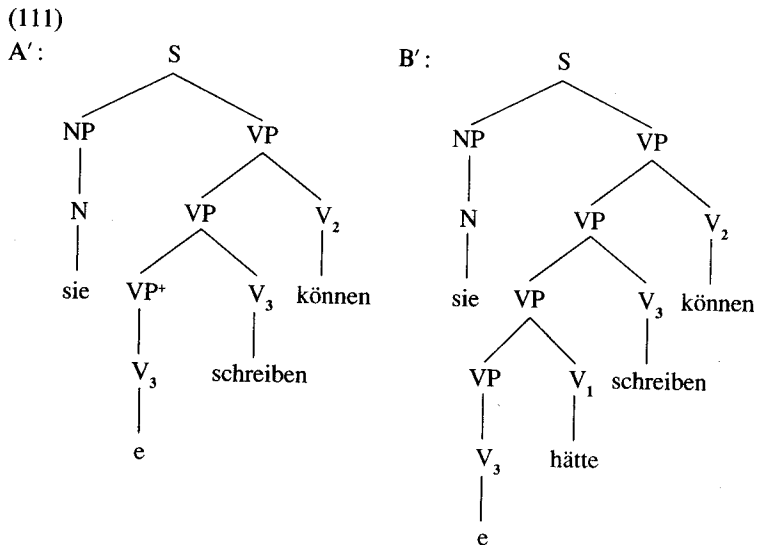
The  $V_1 V_2 V_3$  counterpart of the sequence in (100) would be derived by tree-adjoining B at the lower VP-node of A in A'.

The derivation of the remaining two verb sequences discussed in section 3.5—namely,  $V_1 V_3 V_2$  and its mirror image  $V_2 V_3 V_1$ —requires the

Chomsky-adjunction of infinitives to VP. The trees needed to derive the verb sequence in (102) are given in (110).



Both auxiliary trees adjoin simultaneously in the initial tree at VP\* and VP+, respectively. For expository reasons, we again illustrate the derivation as if the adjunction of A preceded that of B.



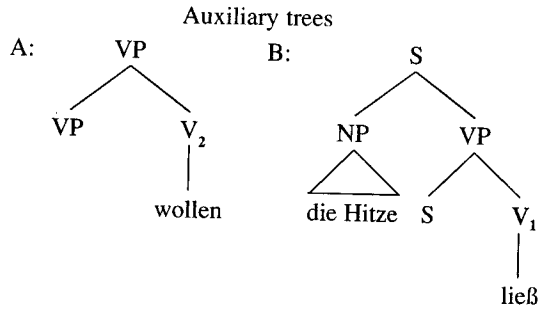
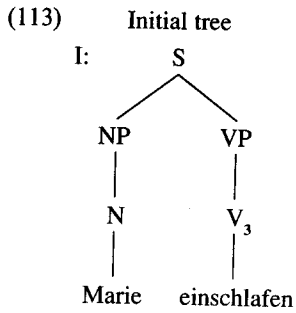
As the reader can easily verify, the mirror image of the verb sequence in (102), which is illustrated for Swiss German in (81), can be derived by performing adjunction at the converse nodes of the initial tree.

Under a TAG analysis without string-vacuous verb raising, it is not possible to reduce the variation in the word order of verb sequences to a single difference, as under the string-vacuous raising hypothesis. Rather, there are two sources of such variation, which are a result of the fundamental distinction that is drawn in a TAG between the expression of local relations on the one hand and recursion on the other. The first source of word order variation is the choice between elementary trees with or without extraposed infinitives, and the second is the choice between different nodes as sites for tree-adjunction. Note that from the point of view of learnability, a syntactic analysis without string-vacuous verb raising is preferable to one with it. Under the string-vacuous raising hypothesis, the language learner would need to postulate the existence of trees with links in the absence of positive string evidence. An analogous learnability problem arises when a morphological analysis is maintained for German, as Evers (1981) notes. A syntactic analysis without string-vacuous verb raising, on the other hand, requires the language learner to posit trees with links only when faced with relevant string evidence.

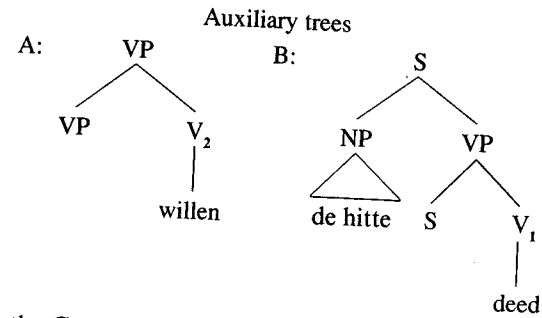
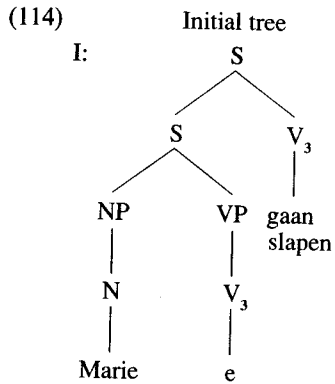
We conclude this section by reporting an interesting and subtle consequence of our TAG analysis. Given the small clause analysis of the complements of causatives and perception verbs that we have so far been assuming, a TAG analysis predicts the following contrast between German and Dutch.

- (112) a. daß die Hitze Marie einschlafen wollen ließ (German)  
 that the heat Marie fall-asleep want-to made  
 'that the heat made Marie want to fall asleep'  
 b. \*dat de hitte Marie deed willen gaan slapen (Dutch)  
 that the heat Marie made want-to go sleep  
 (same as (112a))

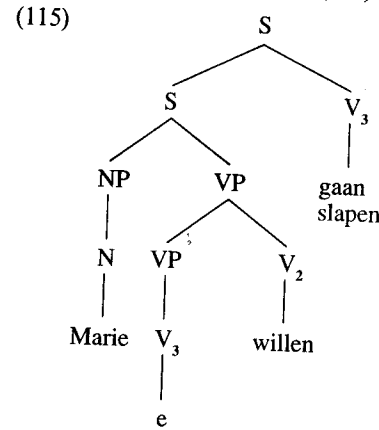
The derivation of (112a) is straightforward and requires that the first and second auxiliary trees in (113) adjoin simultaneously at VP and S of the initial tree.



Now consider the derivation of (112b), which uses the trees in (114).<sup>29</sup>



As in the German case, the auxiliary trees would need to adjoin into the initial tree simultaneously. But whereas the auxiliary tree containing the modal can adjoin to the VP of the initial tree, yielding the tree in (115), the word order of the verb sequence in (112b) requires the auxiliary tree containing the causative to be adjoined at an S-node within the c-command domain of *willen*. But such a node does not exist, and hence (112b) cannot be derived using the trees in (114).<sup>30</sup>



Though judgments concerning (112a) and (112b) are delicate, speakers of German and Dutch reacted differently to the corresponding sentences. The German speakers judged (112a) to be well formed, though some objected to its stylistic infelicity. By contrast, none of our Dutch informants accepted (112b), and one of them spontaneously cited the collocation of *deed* and *willen* as the source of unacceptability.<sup>31</sup>

#### 4.6 Constituent Stranding in the Verb Sequence

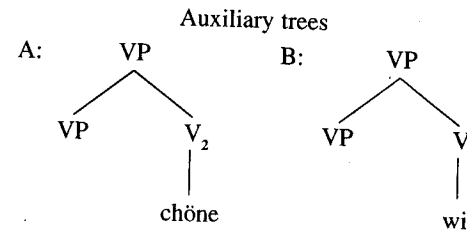
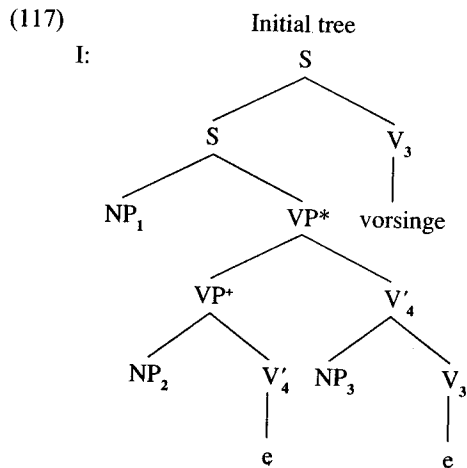
We conclude the presentation of our TAG analysis of the verb-raising construction with a brief discussion of a further interesting class of verb-

raising constructions. Lötscher (1978) and Haegeman and Van Riemsdijk (1986) note that Swiss German permits not only the raising of verbal projections, as in (116a), but also the stranding of NP arguments within the sequence of verbs, as in (116b).<sup>32</sup>

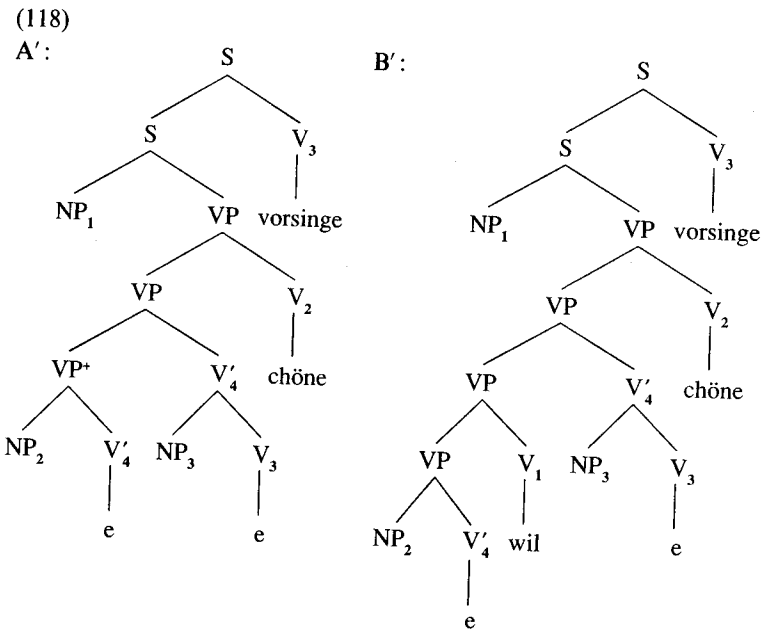
- (116) a. *das er em Karajan wil chöne en arie vorsinge*  
 that he to-the Karajan wants-to be-able an aria sing-for  
 'that he wants to be able to sing an aria for Karajan'
- b. *das er em Karajan wil en arie chöne vorsinge*  
 that he to-the Karajan wants-to an aria be-able sing-for  
 (same as (116a))

Haegeman and Van Riemsdijk (1986) observe that analyses based on the cyclic adjunction of verbs or verbal projections, such as that proposed by Evers (1975) or Den Besten and Edmondson (1983), are unable to derive verb sequences that contain stranded constituents. Under Haegeman and Van Riemsdijk's analysis, sentences containing stranded constituents are derived by the multiple application of reanalysis to a given string.

In a TAG, the verb sequence in (116b) can be derived using an initial tree that encodes two instances of infinitive extraposition—namely, the extraposition of the phrasal projection that dominates *en arie vorsinge* to VP and the further extraposition of the lexical projection *vorsinge* to S. To simplify the representation in (117), we follow Haegeman and Van Riemsdijk in using the labels NP<sub>1</sub>, NP<sub>2</sub>, and NP<sub>3</sub> as abbreviations for *er*, *em Karajan*, and *en arie*, respectively.



The sequence in (116b) is derived by adjoining the auxiliary tree containing *chöne* at VP\*, and the one containing *wil* at VP+. We illustrate the derivation as if the adjunction of the first auxiliary tree preceded that of the second.



### 5 Conclusion

Not surprisingly, many important issues concerning the West Germanic verb-raising construction remain unresolved. Chief among these is the question of why verb raising is obligatory in so many West Germanic verb sequences. This is a particularly difficult problem for a morphological incorporation analysis. In a case like the Chicheŵa causative construction,

the application of incorporation can be derived from the fact that the causative verb is an affix and hence cannot stand alone in derived structure. No such solution is available for the West Germanic case, where the elements in question are all full lexical items that can and do stand alone in other environments like simple tensed sentences and nominal infinitives. In an attempt to derive the obligatoriness of verb raising from principles of Universal Grammar, Evers (1981) proposes that verbs in Dutch and German must be aux-indexed according to the following recursive definition.

- (119) A verb is aux-indexed if it incorporates  $\langle +\text{tense} \rangle$  or  $\langle -\text{tense} \rangle$  or if it is minimally and uniquely c-commanded by an aux-indexed verb.

According to Evers, *to*-infinitives either are unspecified for tense, like bare infinitives, or else bear the feature value  $[-\text{tense}]$ . When *to*-infinitives are unspecified for tense, they must undergo verb raising in order to acquire an aux-index just like bare infinitives, whereas *to*-infinitives that are specified for tense must undergo S'-extraposition just like tensed complement clauses. Evers's proposal is problematic in two respects. First, since he does not explain why aux-indexing is obligatory in Dutch and German, but not in other languages, his proposal is stipulative. Second, the aux-indexing proposal fails to explain why verb raising occurs even in environments in which bare infinitives are not c-commanded by an aux-indexed verb (Zaenen 1979).

- (120) Jan naar die manifestatie laten gaan doe ik nooit!  
 Jan to the demonstration let go do I never  
 (standard Dutch)  
 'I'll never let Jan go to that demonstration.'

In (120) *doe* functions as a carrier of tense, just like its English cognate *do*. The underlying structure associated with (120) is that in (121).

- (121) ik nooit [<sub>VP</sub> [<sub>S</sub> Jan naar die manifestatie gaan] laten] doe

The sentence in (120) is derived by preposing the bracketed VP in (121) to clause-initial position and moving *doe* to second position. The sequence *gaan laten* then undergoes verb raising, yielding the surface order in (120), in spite of the fact that *laten* is a bare infinitive and cannot aux-index *gaan*.<sup>33</sup>

Under a syntactic treatment of verb raising, on the other hand, it is natural to consider the obligatoriness of verb raising in certain syntactic environments as the grammaticization of infinitive extraposition, which

serves to reduce the processing complexity associated with center-embedded structures. The extraposition of infinitives has thus become obligatory for the same reason that it is obligatory in the case of tensed complement clauses in Dutch and German and untensed complement clauses in Dutch, and preferred in the case of untensed complement clauses in German. Evidence that this approach is on the right track comes from at least three sources. First, Evers (1975:55) notes that the verb-raising construction is acceptable to a greater embedding depth and is used more frequently in Dutch than in German. Evers's observation is corroborated by the psycholinguistic study reported by Bach, Brown, and Marslen-Wilson (1987), according to which the verb-raising construction is processed more easily and accurately in Dutch, where it results in crossing dependencies, than in German, where the underlying nested dependencies are preserved at S-Structure. Second, Zaenen (1979) notes that short verb sequences can exhibit the underlying order of verbs in at least some dialects of Dutch if they consist of a single verb governing a bare infinitive. In sequences consisting of a single verb governing a *to*-infinitive or more than two verbs, verb raising is obligatory. In the nonstandard dialects of German that freely allow verb raising, such as Swiss German, verb raising also becomes obligatory once the sequence of verbs attains a certain degree of complexity, which Lötscher (1978) attempts to quantify. Third, many nonstandard dialects of German allow verb raising more freely than the standard language. Moreover, mixed crossing and nested dependencies like (122) are acceptable and fairly frequent in colloquial standard German (Kvam 1983; Hans-Ulrich Block, personal communication).

- (122) daß Hans der Frau das Buch versucht hat zu geben  
 that Hans to-the woman the book tried has to give  
 'that Hans tried to give the woman the book'

As Lenerz (1984:177) notes, earlier stages of German also permitted verb raising more freely than the contemporary language, in which the superficial order of verbs in the verb sequence reflects their underlying order fairly strictly.<sup>34</sup> We attribute the aversion of the modern written language to verb raising to the fact that there has been a steady development in the written language dating from the Early New High German period toward strict verb-finality at S-Structure. Thus, though both Dutch and German are underlying verb-final languages (Koster 1975; Thiersch 1978), German, unlike Dutch, does not allow PP extraposition as freely as Dutch and does not require the extraposition of untensed complement clauses.

The question of how the grammaticization of infinitive extraposition is to be expressed formally in a synchronic grammar remains open. One approach that seems to us to be promising is to argue that to varying extents in the various dialects of West Germanic, the directionality of  $\theta$ -role assignment by matrix verbs to complement verbs has become decoupled from basic phrase structure order. Thus, whereas West Germanic verb phrases continue to be head-final and to assign Case and  $\theta$ -roles to the left for nominal arguments, they have come to assign  $\theta$ -roles to the right for complement verbs and clauses. Under such conditions, a complement verb or clause might have to extrapose in order to receive its  $\theta$ -role. This would then account for why tensed clauses in German and all complement clauses in Dutch must extrapose. Further, if we accept that  $\theta$ -roles are assigned to the heads of phrases rather than to maximal projections as we proposed in section 3.1, then verb raising, interpreted as infinitive extraposition, becomes simply a way of satisfying the directionality requirement of  $\theta$ -role assignment for verbal complements. Needless to say, these remarks are largely speculative and should be taken only as suggestive of a possible line of investigation for future research.

We conclude this paper by briefly recapitulating our findings. In section 2 we presented four arguments against the claim that verb raising involves clause pruning or clause union, and we reformulated the currently accepted verb cluster analysis of the verb-raising construction as the claim that verb raising is the result of morphological incorporation. In section 3 we showed that all of the arguments that have been proposed in support of this analysis are incorrect or inconclusive. We then drew the conclusion in section 4 that an incorporation analysis of verb raising is not tenable in the case of *to*-infinitives, basing our finding on evidence from two sources. First, the facts of clitic placement in Dutch show that verbs undergo raising out of full *S'*-complements. If verb raising were incorporation, these facts would be surprising in view of the constraints on incorporation familiar from other languages. Second, the contrast between complex nominalizations of bare infinitives, which are grammatical, and of *to*-infinitives, which are not, shows that verb sequences containing *to*-infinitives cannot be complex verbs. Given that the empirical evidence in the case of bare infinitives is consistent with either a morphological or a syntactic analysis of bare infinitive raising, we then proposed the uniform derivation hypothesis, according to which a syntactic analysis of verb raising extends to bare infinitives. This extension is conceptually desirable since it results in a unitary analysis of the word order facts in Dutch verb sequences. The comparative data we presented from Flemish and Swiss German and

earlier stages of Dutch and German lent empirical support to the uniform derivation hypothesis.

Adopting Zaenen's analysis of verb raising as infinitive extraposition, we presented two TAG instantiations of her syntactic analysis. Though the first of these turned out to be conceptually inadequate, our second TAG analysis accounted straightforwardly for the range of word order variation that we find in West Germanic, including a class of examples that are underivable under a morphological analysis since they contain constituents that are stranded within the sequence of verbs. The fact that it is possible to formulate two alternative linguistic analyses in the TAG formalism illustrates the important methodological point that although the TAG formalism allows us to instantiate linguistic analyses in a natural way, it does not in itself provide a linguistic analysis and hence is not itself a theory of grammar. Instead, it is a metalanguage that enforces precise statements of linguistic analyses in which it is possible to trace exactly how the consequences of each linguistic decision ramify throughout the grammar. Finally, we suggested that West Germanic verb raising might represent the grammaticization of the process of infinitive extraposition, which, like other instances of extraposition, reduces the processing complexity associated with the underlying center-embedded structures to which it applies.

#### Notes

1. In this paper we use *West Germanic* as a convenient cover term for standard Dutch and German and their nonstandard varieties rather than in its traditional sense, in which it also includes English.
2. We have omitted *S'*, *COMP*, and *INFL* nodes in order to simplify the representation in (3); no theoretical point is intended.
3. Following Evers, we will give standard German examples from now on, unless an argument depends on word order facts specific to other varieties of West Germanic.
4. When governing an infinitive, the expected past principle of a modal supplet to the infinitive in all varieties of West Germanic except Frisian. We make no attempt here to explain this phenomenon, which goes by the names of *Ersatzinfinitiv*, *infinitivus pro participio*, or *double infinitive construction*. (For discussion, see Hocksema 1980, 1988; Lange 1981; Den Besten and Edmondson 1983 and references therein).
5. Given the parallel word order of the West Flemish example in (10b) and its standard Dutch equivalent in (11b), we would expect both examples to exhibit the same scope ambiguity. The narrow scope reading may not be available in standard Dutch, however—a fact for which we would have no explanation.



6. We assume that the different syntactic status of modals in English and in the West Germanic languages is irrelevant to the issue at hand.

7. Note that the escape of quantifiers is governed by the same condition as verb raising itself. Thus, neither quantifier raising nor verb raising is possible out of tensed complement clauses, which are obligatorily extraposed in German and Dutch. Furthermore, verb raising out of subject complement clauses is ruled out, even when these are not extraposed (Evers 1975:40).

(i) daß die Kraniche zu sehen mich erschüttert  
that the cranes to see me upsets  
'that it upsets me to see the cranes'

(ii) \*daß die Kraniche mich zu sehen erschüttern  
that the cranes me to see upset  
(same as (i))

In a parallel way, negation cannot escape out of the subject complement clause in (iii).

(iii) daß die Kraniche nicht zu sehen mich erschüttert  
that the cranes not to see me upsets

Thus, (iii) means only 'that is upsets me not to see the cranes' and not 'that it does not upset me to see the cranes.' The extreme unacceptability of (ii) suggests that it is due to a violation of the Empty Category Principle or the Condition on Extraction Domains (Huang 1982) rather than to a Subjacency violation. If this is the case, then the asymmetry between subject and object clauses with respect to verb raising and quantifier raising provides evidence for the existence of VP in German.

8. Certain Dutch dialects pattern with German in this respect (Weijnen 1966:327). Clitic movement to the position immediately following COMP is subject to a constraint that clitic objects must not precede pronominal subjects.

9. Baker (1988) observes that in principle, the multiple application of verb incorporation is grammatical in Chicheŵa. However, double causatives are awkward and triple causatives are completely unacceptable since verb incorporation gives rise to center-embedded structures that are extremely difficult to parse. West Germanic verb raising remains acceptable to a greater embedding depth than the Chicheŵa causative construction, perhaps because it is not restricted lexically to the complements of a single verb.

10. Since even simple *to*-infinitives do not nominalize in Dutch and German, the analysis of bare infinitive nominalizations that we present below correctly and straightforwardly rules out the unacceptable *to*-infinitive nominalizations in (42b). We attribute the inability of *to*-infinitives to nominalize to the fact that, containing INFL, they are necessarily phrasal.

11. The personal passive construction in (i) is ruled out for this reason, in contrast to the impersonal passive in (ii).

(i) \*Die Kinder wurden geholfen.  
the children-NOM were helped  
'The children were helped.'

(ii) Den Kindern wurde geholfen.  
the children-DAT was helped  
(same as (i))

12. In contrast to the spelling of the nominalizations of these derived verbs, which are spelled as one word, the spelling of the verbs themselves is misleading since it suggests that they are phrases.

13. The analysis of bare infinitive nominalizations presented in the text does not account for, and in fact predicts to be ungrammatical, complex nominalizations like (i), which are accepted by many speakers (Höhle 1984).

(i) a. dein ewiges (den)- Kindern- Schokolade-geben  
your eternal to-the children chocolate giving  
'your constant giving chocolate to (the) children'  
b. dein ewiges (den)- Kindern-die-Schokolade-geben  
your eternal to-the children the chocolate giving  
'your constant giving the chocolate to (the) children'

The fact that in such cases speakers accept direct objects that are maximal projections as well as incorporated direct objects suggests to us that the nominalizations in (ia) and (ib) are derived by a linguistically marginal process of nonce-nominalization that results in complex nominalized forms that correspond to VPs and that is distinct from the nominalization processes discussed in the text. In contrast to the nominalized forms derived by these latter processes, which decline in acceptability as they become more complex, nonce-nominalizations tend to become slightly more acceptable as they gain in complexity. They remain quite awkward, however, and seem similar to English cases like *This looks like a hunker-down-and-wait-out-the-storm situation*.

The distinction between linguistically well integrated nominalization processes on the one hand and nonce-nominalization on the other permits us to account for the following pattern of acceptability, noted by Höhle (1984:fn. 16c).

(i) a. dein den-Ball-in-die-Ecke- werfen  
your the ball in the corner throwing  
'your throwing the ball into the corner'  
b. dein ewiges den- Kindern-süße- Bonbons- schenken  
your eternal to-the children sweet candies giving  
'your constant giving the children sweet candies'  
(ii) a. dein in-die- Ecke- werfen des Balls  
your in the corner throwing of-the ball  
(same as (ia))  
b. \*dein ewiges den- Kindern-schenken süßer Bonbons  
your eternal to-the children giving of-sweet candies  
(same as (ib))

The nonce-formations in (i) are equally acceptable. But whereas the thematic structure of the underlying verbs is expressed in an apparently parallel manner in (ii), with the theme argument occurring in postnominal position in both cases, there is a marked contrast in the acceptability of (iia) and (iib). Under our analysis, this contrast is due to the fact that the derivations of (iia) and (iib) are not parallel.

The form in (iia) is derived by nominalizing the verbal infinitive *werfen*. The PP argument can precede the nominal infinitive since it does not require Case, whereas the NP argument must appear in the postnominal position, where it receives structural genitive Case. The nominalization in (iib), on the other hand, cannot be derived by the first two nominalization processes discussed in the text nor is it a possible nonce-formation, since *den Kindern schenken* is not a VP.

14. Recall that the expected participle of the modal *wollen* suppletes to the infinitive, just as in the West Flemish case in (8).

15. For some speakers, all bare infinitive nominalizations containing *haben* are unacceptable.

16. The forms in (61) are also not possible nonce-formations since the verb sequences in (59c) and (60c) are not VPs.

17. *Leere* 'learn' takes both bare infinitive and *to*-infinitive complements. The *to*-infinitive variant of (65) given in (i) is independently ruled out by the fact that *to*-infinitive sequences contain INFL, as mentioned in note 10.

- (i) \*Er isch am leere s auto z repariere.  
 he is at-the learn the car to repair  
 (same as (65))

18. In the preverbal position, *nicht* can express only constituent negation of the verb.

19. NP arguments that occur within the verb sequence as a result of syntactic lowering are either quantifiers or require special stress, unlike *das Buch* in (68).

20. Emphatic coordination appears to be acceptable only on the first position of a sequence of verbs; thus, the translation equivalents of (77a) in Dutch and (77b) in German are unacceptable.

21. Arguments for the verb cluster based on coordination are given quite often (Bresnan et al. 1982; Steedman 1985). In the absence of a satisfactory linguistic theory of conjunction, however, their strength is hard to evaluate (but see Steedman 1989). In this paper we will have nothing further to say on the analysis of conjoined verb sequences, though we recognize that ultimately a convincing account of them will be required.

22. For sequences like (82), Lötscher (1978) suggests that the participle *aagfange* and the auxiliary *hät* are rebracketed as a single constituent, which then permutes with the most deeply embedded verb *rägne*. His rebracketing proposal, however, does not extend to the Franconian word order in (83).

23. The formulation of this generalization is ours; Baker himself uniformly assigns the category *S'* to all infinitival complements.

24. Even if we follow Chomsky (1986a) in interpreting X-bar theory as a constraint on D-Structure only, an incorporation analysis of verb projection raising violates the Like-Attracts-Like Constraint proposed by Baltin (1982). We thank Lori Davis for this point.

25. Haegeman and Van Riemsdijk (1986: 432) argue for a distinction between verb (projection) raising and extraposition. They claim that if verb (projection) raising

were subsumed under extraposition, the ungrammaticality of raising constituents of category *S*, illustrated in (i) for Swiss German, "would remain quite mysterious."

- (i) \*das er wil laa sini chind mediziin studiere  
 that he wants-to let his children medicine study  
 'that he wants to let his children study medicine'

They go on to interpret the ungrammaticality of (i) as evidence against analyses under which *S* is a projection of *V* in the Germanic languages other than English. But both their distinction between verb (projection) raising and extraposition and their interpretation of the ungrammaticality of (i) are vitiated by the fact that (i) is ruled out for independent reasons. Since verbs cannot assign Case rightward in West Germanic, the subject of the complement of the causative *laa*—namely, *sini chind*—fails the Case Filter. Thus, the ungrammaticality of (i) fails to bear on the status of *S* as a projection of *V*, nor does it bear on the existence of *VP* as a maximal projection of *V* in German and Dutch. Our alternative analysis of the ungrammaticality of (i) is supported by the contrast between leftward and rightward movement of small clauses, as illustrated in (ii) and (iii), respectively.

- (ii) ?Meinen Mann mit einer anderen tanzen würde ich nie lassen.  
 my husband with an other dance would I never let  
 'I would never let my husband dance with another woman.'

- (iii) \*Ich würde nie lassen meinen Mann mit einer anderen tanzen.  
 I would never let my husband with an other dance  
 (same as (ii))

26. We will not give the TAG derivations of the LF representations discussed in section 2.1, although more than one implementation is possible in a TAG analysis.

27. Verb sequences that contain NP constituents, like those discussed in section 3.1 and 4.1, can be derived by using elementary trees in which phrasal projections of the verb are extraposed.

28. The different types of constraints on tree-adjunction and their consequences for the generative power of TAG are discussed in detail in Joshi 1983 and Kroch and Joshi 1985.

29. For expository convenience, we treat *gaan slapen* as a simple lexical item.

30. Deriving the converse embedding of causatives of perception verbs under modals is unproblematic in both German and Dutch.

31. Linguistically trained speakers of Dutch hesitate to rule out (112b) on syntactic grounds, pointing out that its unacceptability might be due to a violation of the selectional restrictions of the causative. If this turns out to be correct, the derivation of (112b) in a TAG would require an analysis under which causative subcategorize not for small clauses but rather for an NP VP sequence. The hypothesis that selectional restrictions are responsible for the difference in the judgments of Dutch and German speakers seems implausible to us, however, since one would expect the same selectional restrictions to hold in both languages.

32. In standard Dutch, particle verbs such as *inleveren* 'hand in' may be split, with the particle ending up stranded within the sequence of verbs (Lange 1981: 77).

- (i) omdat- ie het boek heeft in willen leveren  
because you the book have in want-to hand  
'because you wanted to hand in the book'
33. Alternatively, verb raising could precede constituent preposing if it is assumed to be cyclic. Constituent preposing would then have to apply to the derived constituent, as in (i).
- (i) [<sub>VP</sub>[<sub>VP</sub>[<sub>S</sub> Jan naar de manifestatie e<sub>i</sub>] laten] gaan<sub>i</sub>]
34. Note that the freer application of verb raising in Middle High German continues to be reflected in the order of the elements in the nominalization *Hörensagen* 'hearsay.'

### References

- Bach, E., C. Brown, and W. D. Marslen-Wilson (1987). "Crossed and Nested Dependencies in Dutch and German: A Psycholinguistic Study." *Language and Cognitive Processes* 1: 249–262.
- Baker, M. (1988). *Incorporation: A Theory of Grammatical Function Changing*. University of Chicago Press, Chicago.
- Baltin, M. (1982). "A Landing Site Theory of Movement Rules." *Linguistic Inquiry* 13: 1–38.
- Baltin, M. (1989). "Heads and Projections." In M. Baltin and A. S. Kroch, eds., *Alternative Conceptions of Phrase Structure*. University of Chicago Press, Chicago.
- Besten, H. den., and J. A. Edmondson (1983). "The Verbal Complex in Continental West Germanic." In W. Abraham, ed., *On the Formal Syntax of the Westgermania*. Benjamins, Amsterdam.
- Besten, H. den, and J. Rutten (1989). "On Verb Raising, Extraposition and Free Word Order in Dutch." In D. Jaspers, ed., *Sentential Complementation and the Lexicon*. Foris, Dordrecht.
- Besten, H. den, J. Rutten, T. Veenstra, and J. Veld (1988). "Verb raising, extraposition en de derde constructie." Ms., University of Amsterdam.
- Bresnan, J. W., R. M. Kaplan, S. Peters, and A. Zaenen (1982). "Cross-serial Dependencies in Dutch." *Linguistic Inquiry* 13: 613–635.
- Chomsky, N. (1981). *Lectures on Government and Binding*. Foris, Dordrecht.
- Chomsky, N. (1982). *Some Concepts and Consequences of the Theory of Government and Binding*. MIT Press, Cambridge, Mass.
- Chomsky, N. (1986a). *Barriers*. MIT Press, Cambridge, Mass.
- Chomsky, N. (1986b). *Knowledge of Language: Its Nature, Origin and Use*. Praeger, New York.
- Evers, A. (1975). "The Transformational Cycle in Dutch and German." Doctoral dissertation, University of Utrecht. Distributed by the Indiana University Linguistics Club, Bloomington.

- Evers, A. (1981). "Two Functional Principles for the Rule 'Move V.'" *Groninger Arbeiten zur germanistischen Linguistik* 19: 96–110.
- Haegeman, L., and H. van Riemsdijk (1986). "Verb Projection Raising, Scope, and the Typology of Verb Movement Rules." *Linguistic Inquiry* 17: 417–466.
- Heycock, C. (1987). "The Structure of the Japanese Causative." Technical report MS-CIS-87-55, Department of Computer and Information Sciences, University of Pennsylvania.
- Höhle, T. N. (1984). "On Composition and Derivation: The Constituent Structure of Secondary Words in German." In J. Toman, ed., *Studies in German Grammar*. Foris, Dordrecht.
- Hoeksema, J. (1980). "Verbale verstrengeling ontstrengeld." *Spektator* 10: 221–249.
- Hoeksema, J. (1988). "A Constraint on Governors in the West Germanic Verb Cluster." In M. Everaert, A. Evers, M. A. C. Huybregts, and M. Trommelen, eds., *Morphology and Modularity. In Honour of Henk Schuttkink*. Foris, Dordrecht.
- Huang, C.-F. (1982). "Logical relations in Chinese and the Theory of Grammar." Doctoral dissertation, MIT.
- Joshi, A. K. (1983). "Tree Adjoining Grammars: How Much Context-Sensitivity Is Required to Provide Reasonable Structural Descriptions?" In D. Dowty, L. Karttunen, and A. Zwicky, eds., *Natural Language Processing: Psycholinguistic, Computational and Theoretical Perspectives*. Cambridge University Press, New York.
- Joshi, A. K. (1990). "Processing Crossed and Nested Dependencies: An Automaton Perspective on the Psycholinguistic Results." *Language and Cognitive Processes* 5: 1–27.
- Joshi, A. K., L. Levy, and M. Takahashi (1975). "Tree Adjunct Grammars." *Journal of the Computer and System Sciences* 10: 136–163.
- Kemenade, A. van (1985). "Verb Raising in Old English." In *Proceedings of the Fourth Amsterdam Conference of English Historical Linguistics*. Benjamins, Amsterdam.
- Koster, J. (1975). "Dutch as an SOV Language." *Linguistic Analysis* 1: 111–136.
- Kroch, A. S. (1987). "Unbounded Dependencies and Subjacency in a Tree Adjoining Grammar." In A. Manaster-Ramer, ed., *Mathematics of Language*. Benjamins, Philadelphia.
- Kroch, A. S. (1989). "Asymmetries in Long Distance Extraction in a Tree-Adjoining Grammar." In M. Baltin and A. S. Kroch, eds., *Alternative Conceptions of Phrase Structure*. University of Chicago Press, Chicago.
- Kroch, A. S., and A. K. Joshi (1985). "The Linguistic Relevance of Tree Adjoining Grammars." Technical report, Department of Computer and Information Sciences, University of Pennsylvania.

- Kroch, A. S., and A. K. Joshi (1987). "Analyzing Extraposition in a Tree Adjoining Grammar." In G. Huck and A. Ojeda, eds., *Discontinuous Constituency*. Academic Press, New York.
- Kroch, A. S., and B. Santorini (1985). "Questioning the West Germanic Verb Cluster." Paper presented at the Annual Winter Meeting of the Linguistic Society of America, Seattle, Wash.
- Kvam, S. (1983). *Linksverschachtelung im Deutschen und Norwegischen*. Niemeyer, Tübingen.
- Lange, K.-P. (1981). "Warum Ersatzinfinitiv?" *Groninger Arbeiten zur germanistischen Linguistik* 19: 62-81.
- Lenerz, J. (1984). *Syntaktischer Wandel und Grammatiktheorie*. Niemeyer, Tübingen.
- Lötscher, A. (1978). "Zur Verbstellung im Zürichdeutschen und in anderen Varianten des Deutschen." *Zeitschrift für Dialektologie und Linguistik* 45: 1-29.
- Marantz, A. (1984). *On the Nature of Grammatical Relations*. MIT Press, Cambridge, Mass.
- May, R. (1985). *Logical Form: Its Structure and Derivation*. MIT Press, Cambridge, Mass.
- Reuland, E. (1980). "V-Raising in Dutch: Anomalies Explained." In *Papers from the Sixteenth Regional Meeting, CLS*. Chicago Linguistic Society, University of Chicago.
- Riemsdijk, H. van (1984). "On Pied-Piped Infinitives in German Relative Clauses." In J. Toman, ed., *Studies in German Grammar*. Foris, Dordrecht.
- Rizzi, L. (1982). *Issues in Italian Syntax*. Foris, Dordrecht.
- Steedman, M. (1985). "Dependency and Coordination in the Grammar of Dutch and English." *Language* 61: 523-568.
- Steedman, M. (1989). "Constituency and Coordination in a Combinatory Grammar." In M. Baltin and A. S. Kroch, eds., *Alternative Conceptions of Phrase Structure*. University of Chicago Press, Chicago.
- Thiersch, C. (1978). "Topics in German Syntax." Doctoral dissertation, MIT.
- Weijnen, A. A. (1966). *Nederlandse dialectkunde*. Van Gorcum, Assen.
- Zaenen, A. (1979). "Infinitival Complements in Dutch." In *Papers from the Fifteenth Regional Meeting, CLS*. Chicago Linguistic Society, University of Chicago.