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HOW COMPLEX ARE COMPLEX PREDICATES?*

Abstract: This paper argues that clause union/restructuring constructions such as verb clusters in German do not involve head clustering in the form of (lexical or derived) complex head formation. I provide several arguments showing that clause union properties are licensed in the absence of complex head formation and that complex head formation hence cannot be seen as a condition on clause union/restructuring. Complex head approaches are compared to syntactic complementation approaches, in particular an approach where the verbs of a restructuring construction project independent VPs which include all the internal arguments associated with the particular verbs. A series of empirical facts are considered (constituency, word order, modification, and event structure properties, nominalizations) which all point to the conclusion that these constructions involve regular VPs rather than complex V-V heads. While it is not excluded that complex head approaches could be adjusted to accommodate theses facts, the main advantage of the VP-complementation approach is that the sum of the properties discussed follows without additional assumptions from the structure suggested and that this approach also correctly predicts which constructions are excluded.

1. INTRODUCTION

In many languages, constructions are found in which two (or more) predicates form a very close unit for various grammatical properties such as word order, argument structure projection, or Case assignment. Representative constructions of this sort, which are often referred to as *complex predicates*, are particle verb constructions, resultative constructions, and clause union constructions such restructuring infinitives or verb clusters. An illustration of a complex predicate construction is given in (1). In German, the verbal elements of a multiple verb/auxiliary construction typically cluster in clause-final position and can generally not be interrupted by intervening material (see (1)). This required closeness of the verbs involved has given rise to analyses that assume some form of complex predicate formation.

(1) a. *dass* *Leo* {✓ gut} *schwimmen* {*gut} *kann*
that Leo {✓ well} swim {*well} can
'that Leo can swim well'

b. *dass* *Tim* {✓ nicht} *schwimmen* {*nicht} *können* {*nicht} *will*
that Tim {✓ not} swim {*not} can {*not} wants
'that Tim does not want to be able to swim'

Among the vast array of theoretical analyses of these constructions, two basic approaches can be singled out: *complex head approaches* vs. *XP-complementation approaches*. The basic idea of complex head approaches is that the elements of a cluster form a lexical or base-generated unit (i.e., in cases such as (1), a type of a V-V compound) which is responsible for the closeness and unity of the elements involved. According to XP-complementation approaches, on the other hand, the elements of a complex predicate construction are separate syntactic heads projecting to multiple phrases (i.e., multiple VPs or larger projections in cases such as (1)). In addition, some

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clausal complementation approaches assume certain syntactic mechanisms (such as incorporation or other movement operations) that create the desired unity and impenetrability of the verbs. The main goal of this paper is to examine the properties of complex predicate constructions involving multiple verbs in light of these two types of approaches. Although the paper will concentrate on complex predicates in German, similar conclusions can be reached for complex predicate constructions in other languages (see for instance Wurmbrand 2001b for Italian and Bobaljik and Wurmbrand 2004, To appear for Japanese).

The particular questions I will address are how complex head approaches differ empirically from XP-complementation approaches and, after establishing that there are empirical differences, which of the two approaches is more successful in correctly predicting the empirical facts. More specifically, I will first address the question of how the clustering property (the adjacency requirement of the elements of a complex predicate) is accounted for under each of the two approaches. I will show that adjacency, while naturally accounted for under the complex head approach, is not an argument for complex head formation but can also be derived in the XP-complementation approach. Furthermore, I will examine complex predicate constructions in view of their constituency, modification, and argument/event structure properties and conclude that all these properties point to XP-complementation and require some serious stipulations under a complex head approach. In sum, the conclusion will be that XP-complementation provides a simpler account of verbal complex predicate constructions than accounts that make use of special clustering mechanisms such as syntactic or lexical complex head formation.

A final note on the scope of the paper is necessary. Complex head analyses which assume the formation of a complex predicate/head in the lexicon or projection of a complex head in the syntax have been suggested in a variety of frameworks (see for instance Haider 1993, 2003 for GB, Hinrichs and Nakezawa 1994, Kiss 1995, Bouma and Noord 1997, S. Müller 1999, 2002, 2006, Meurers 2000 among many others for HPSG, Geach 1970, Steedman 1985 for Categorial grammar, and Williams 2003 for Representation Theory). Since the focus of this paper is a comparison of complex head approaches with XP-complementation approaches, I will concentrate essentially on *Government and Binding/Minimalist* frameworks where the distinction between a head and an XP is a well-defined meaningful syntactic notion. Since the premises about how syntactic structure is built and how syntactic relations are represented are quite different in some of the other frameworks, it will be impossible to directly compare an XP-complementation approach with complex predicate analyses across frameworks, at least in this paper. Many of the arguments presented against complex head analyses below might thus not automatically extend to complex head analyses in other frameworks. Nevertheless, I believe that the questions raised in this paper are important questions to consider for any complex head approach.

2. COMPLEX HEAD VS. XP-COMPLEMENTATION

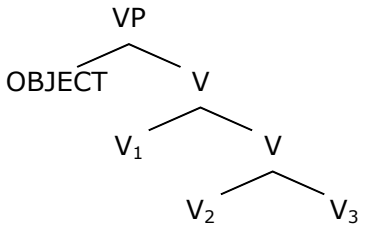
Let us begin by looking in more detail at the two types of approaches to clause union/verb clustering to be compared in this paper. As is well-known, clause union or restructuring constructions are characterized by the fact that these constructions constitute a single mono-clausal domain as diagnosed by a range of phenomena that are typically clause-bound (such as certain movement operations, Case assignment, or scope).[2] One type of account for the mono-clausal

[2] See Bech (1955), Aissen and Perlmutter (1976, 1983), Rizzi (1976, 1978) for the first works on clause union/restructuring in German, Spanish, and Italian, respectively.

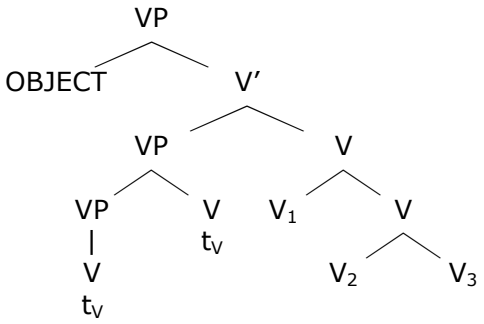
behavior is thus to assume that clause union constructions do not involve a bi-clausal structure but are single clauses throughout the derivation.[3] Among the mono-clausal approaches, however, there are two basic types of approaches which are at the core of this paper.

First, according to complex head approaches, clause union effects (mono-clausal properties) are the result of a base-generated (Jacobs 1992, Haider 1991, 1993, 2003, Sternefeld 2000) or syntactically derived (Bayer and Kornfilt 1994, Saito and Hoshi 1998, Hoshi 1999, Saito 2000) complex head. This is shown in (2). Under the base-generated complex head approach in (2)a, the verbs are projected into the syntax as a single V. Under the derived complex head approach in (2)b, the higher verb combines with a VP, however, the head of the lower VP undergoes incorporation into the higher V. Importantly, under both approaches, the arguments of the two verbs are projected by the V-V complex rather than by the verbs individually. That is, the basic idea of complex head approaches is that the formation of a V-V complex triggers a unification of the argument/event structures of all the verbs involved. The single verbs do not project their argument structures but rather theta-roles are assigned compositionally by the entire V-V complex (typically after some form of argument structure merger or percolation of theta-roles at the point when the two verbs combine into one V-V complex). Thus, the formation of a V-V complex is the crucial factor responsible for the mono-clausal properties.

(2) a. Base-generated complex head



b. Derived complex head



To illustrate this approach, I will discuss mono-clausal constructions involving *long passive*. Case assignment in German is similar to English: active non-unaccusative verbs assign accusative to the direct object, whereas the underlying object of a passive or unaccusative verb occurs with nominative. The same pattern is found in clause union constructions. As shown in (3)a, if the matrix predicate is active (and non-unaccusative), the embedded object obligatorily occurs with accusative case. The interesting case is (3)b,c: if the matrix predicate is passivized or unaccusative (the infinitive, however, remains active), the embedded object takes nominative Case and controls agreement on the matrix auxiliary.

(3) a. *weil er den/*der Traktor versucht hat* [t_{OBJ} *zu reparieren*]
since he the.ACC/*NOM tractor tried has [t_{OBJ} to repair]
'since he tried to repair the tractor'

[3] Since the purpose of this paper is a comparison of complex head approaches with VP-complementation approaches, I will not discuss bi-clausal approaches to clause union here. See Haider (1991, 1993) and Wurmbrand (2001b) for arguments in favor of mono-clausal approaches.

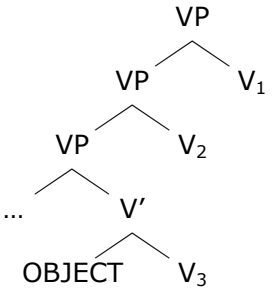
b. *weil* *der Traktor* *zu reparieren* *versucht* *wurde*
since the.NOM tractor to repair tried was
'since they tried to repair the tractor'

c. *weil* *die Traktoren* *zu reparieren* *versucht* *wurden*
since the tractors (NOM) to repair tried were
'since they tried to repair the tractors'

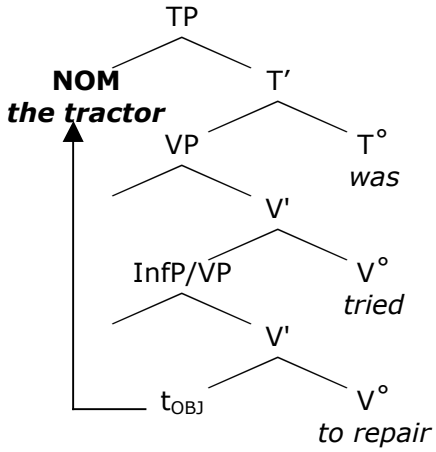
Under the complex head approach, this case conversion is explained as follows: the verbs *to repair* and the passive *was tried* combine their argument structures and assign Case to the arguments compositionally. Since the resulting complex head *was tried* + *to repair* is passive (the head of the V-V complex is the passive V), accusative is not available (like in a simple clause *The cake was tried by many customers*) and hence the object shows up with nominative.

The second mono-clausal approach, the VP-complementation approach, is illustrated in (4).[4] In contrast to the complex head approach, the verbs of a clause union construction project separately and also project their arguments individually. That is, the object *the tractor* in (3) is only an argument of the lower verb and it is projected accordingly as a complement of the selecting infinitive. Under this approach, the mono-clausal behavior of clause union constructions simply follows from the lack of clausal projections (the stacked VPs can be seen analogous to Larsonian VP-shells or a more refined VP-structure; but see fn. 4). Furthermore, assuming that clause union constructions do not only lack clausal projections such as IP, CP, but also the functional domain associated with accusative Case (e.g., *v*P, AgrOP etc.), the phenomenon of long passive follows. As illustrated in (4)b, the lack of an accusative assigner in the infinitive has the effect that the underlying object cannot get Case within the infinitive, but becomes Case dependent on the functional Case domain of the matrix predicate. If the matrix predicate is active (and non-unaccusative), the object receives accusative; if the matrix predicate is passive or unaccusative, the object ends up with nominative.

(4) a. VP-complementation



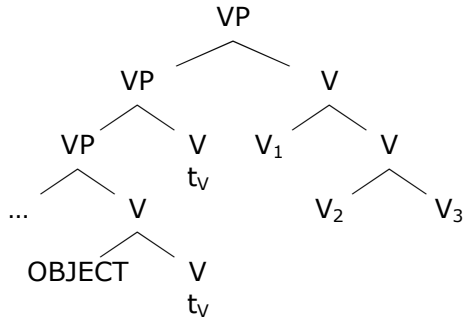
b. Long passive



[4] For this paper, I will treat multiple verb constructions as stacked VPs. However, this is merely for convenience. In Wurmbrand (2001b, 2004d) I argue that certain 'verbs' in these constructions do not head lexical VPs but are rather projected as heads of functional clausal projections (see also Cinque 2001). The arguments presented here will not be affected by this labeling choice.

Finally, there is also a mixed view. One could assume that clause union constructions involve VP-complementation with full lower argument structures, but that incorporation nevertheless applies to derive certain clause union properties and/or word order changes.

(5) a. VP-complementation & incorporation



In sum, all three approaches to clause union characterized here are mono-clausal approaches, however, they differ in crucial ways (complex head formation, argument structure projection) which will allow us to compare and evaluate them. In the next section, I will first lay out arguments that have been provided for the complex head approach and against VP-complementation (section 3.1). In section 3.2, I will then offer an alternative explanation of these facts, which will show that the arguments against VP-complementation do not hold up.

3. THE CHALLENGE

3.1 Haider's puzzle

As is well-known, certain types of clause union constructions (see sections 4.1 and 4.2 for more details) are subject to a strict adjacency condition. While the verbs of a multiple verb construction in English can be interspersed with certain elements (see (6)a), (certain) verb clusters in German or Dutch are impenetrable (cf. (6)b, neither adverbs nor extraposed material can occur between the verbs of a cluster; see below for further examples).

(6) a. *The new theory certainly may possibly have indeed been badly formulated.*
[Haider 2003 citing Quirk et al. 1986]

b. *daß die Theorie* […] *schlecht formuliert* (*) *worden* (*) *sein* (*) *mag*
that the theory badly formulated been be may
'that the theory may have been badly formulated'

This property has been taken as evidence for complex head formation by many researchers. Most notably, Hubert Haider has argued in many works for a V-V complex which does not allow any kind of adjunction. I will concentrate here on the most recent proposal (Haider 2003) as it addresses the issue in the most explicit form. Haider (2003) argues that English multiple verb constructions are projected as VP-complementation structures (see (7)a), whereas German multiple verb constructions are projected into the syntax as complex V° heads (see (7)b).

(7) a. $[_{VP} \ldots V [_{VP} \ldots V [_{VP} \ldots V [_{VP} \ldots V \ldots]]]]$
b. $[_{VP} \ldots [_{V^\circ} \ldots [_{V^\circ} \ldots [_{V^\circ} V^\circ V^\circ] V^\circ] V^\circ]]$

Furthermore, following the standard assumption that adjunction of adverbs (and other material, see below) is possible to XPs but not to X°s, it follows straightforwardly from the structures in (7) that English allows material to occur between verbs of a multiple verb construction, whereas German verb clusters are impenetrable.[5]

In addition, Haider offers an interesting argument against VP-complementation in German verb clusters, which I will refer to as *Haider's puzzle*. As shown in (8), extraposition of, for instance, a relative clause cannot target a position between two verbs of a clause final cluster ((8)a) nor can such extraposition target a position preceding the cluster ((8)b). Instead extraposed material must be placed at the very end of the cluster ((8)c).

(8) a. **daß* *er* $[_{VP}$ $[_{VP}$ [*jenen* t_{REL}] *etwas* *gegeben*] [*die ihn darum gebeten haben*] *hat*]
that he $[_{VP}$ $[_{VP}$ [those t_{REL}] sth. given] [who him for.it asked have] has]
'that he gave something to those who asked him for it'

b. **daß* *er* $[_{VP}$ $[_{VP}$ [*jenen* t_{REL}] *etwas* t_V] [*die ihn darum gebeten haben*] *gegeben* *hat*]
that he $[_{VP}$ $[_{VP}$ [those t_{REL}] sth. t_V] [who him for.it asked have] given has]

c. *daß* *er* $[_{VP}$ $[_{VP}$ [*jenen* t_{REL}] *etwas* *gegeben*] *hat*] [*die ihn darum gebeten haben*]
that he $[_{VP}$ $[_{VP}$ [those t_{REL}] sth. given] has] [who him for.it asked have]

If, as indicated in (8), each verb projects its own VP, the question arises why adjunction to these VPs is impossible. That is, if there is no cluster in (8)a, why can't extraposition target the lower VP? Similarly, if one were to assume VP-complementation plus syntactic incorporation (the mixed approach mentioned in section 1), the question would be why extraposition to the lower VP as in (8)b—i.e., preceding the cluster—is impossible. These questions are particularly challenging for the VP-complementation approach, since, as Haider points out, extraposition to the lower VPs cannot be generally excluded in German since it is possible when the verbs are not in clause-final position. This is illustrated in (9). German being a *verb second* (V2) language requires Spec,CP to be filled by one constituent in main clauses. Thus, the strings before the finite verbs in C in (9) constitute single constituents (VPs), and hence extraposition to lower VPs must be allowed in principle.

(9) a. [[$_{VP}$ *jenen* *etwas* *gegeben*] [*die ihn darum gebeten haben*]] *hat* *er* *noch nie*
[[$_{VP}$ those sth. given] [who him for.it asked have]] has he yet never
'He gave something to those who asked him for it'

b. [[$_{VP}$ *jene* *zu verstehen*] [*die ihn kritisieren*]] *hat* *er* *noch nie* *versucht*
[[$_{VP}$ those to understand] [who him criticize]] has he yet never tried
'He had never tried to understand those who criticize him'

[5] Note that if this assumption is not made (see for instance Müller 2006), the initial advantage of the complex head approach disappears. That is, it would then not be possible to predict the difference between English and German in (6) and hence both the complex head and the XP-complementation approach would be faced with the question of why German multiple verb constructions in contrast to the English analogues are impenetrable. While the examples presented so far could be accounted for assuming a ban on right adjunction of adverbs in German, we will see momentarily that the impenetrability issue extends to cases which cannot be excluded this way.

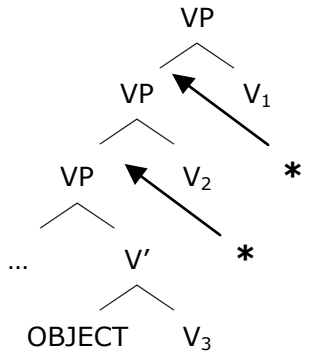
Haider (2003) (and previous works) therefore concludes that the prohibition against extraposition between clause final verbs only follows if the verbs form a base-generated cluster (if the cluster was derived, (8)b should be possible): "…the 'no-intervener' property is clear counterevidence to any analysis of cluster construction that operates with V-projections (or higher ones) as minimal building units of clusters" [p. 94]. In what follows I will show that this conclusion does not hold and that there is a straightforward way to account for Haider's puzzle.[6]

3.2 Picking up the challenge

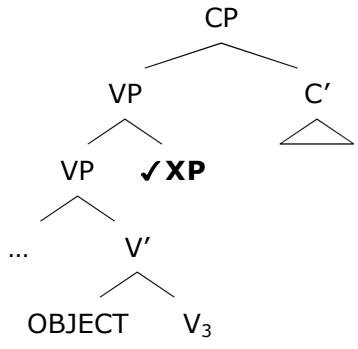
To begin with, let us note that adjacency per se does not entail complex head formation. While a base-generated complex head analysis might entail adjacency (under the assumption that intervening material can only attach to XPs), an adjacency requirement does not entail a complex head analysis. One of the clearest cases of adjacency without head clustering seems to be Case adjacency in English. As is well-known (see for instance Johnson 1991), in English, accusative arguments must be adjacent to the Case-assigning verb (or functional projection). That there is no complex head formation involved is most obvious in ECM constructions, where the Case-assigning verb (or functional projection) is clearly separated from the accusative argument by a phrasal category (V [$_{\text{XP-INF}}$ ACC…]), however, adjacency must nevertheless be obeyed. The general account of Case adjacency involves some assumption that adjunction to the XP which hosts the accusative is prohibited (see Johnson 1991 for some explicit assumptions along these lines).

Returning to verb clusters in German, we can employ the same strategy. That is, one could assume a restriction that requires adjunction to the highest VP in a particular substructure. Under this assumption, adjunction would have to target the highest VP in (10)a and adjunction to any of the intermediate VPs would be prohibited. In (10)b, on the other hand, the topicalized VP is the highest VP in the structure after movement, and hence adjunction to that VP will be possible. The challenge for a VP complementation approach plus this adjunction restriction is then to provide independent reasons for why adjunction is only possible to the highest VP. Such reasons are provided in Truckenbrodt (1995) which I will basically adopt here (with a slightly different implementation).

(10) a. Clause final VPs



b. Topicalized VP



[6] Haider also concludes from the facts in (8) that there is no V-to-V or V-to-I head movement in German. The alternative account I will lay out below will show that this conclusion also does not hold.

Truckenbrodt argues that extraposition is an edge effect which is subject to prosodic factors. More specifically, he suggests the following constraint on extraposition in (11).

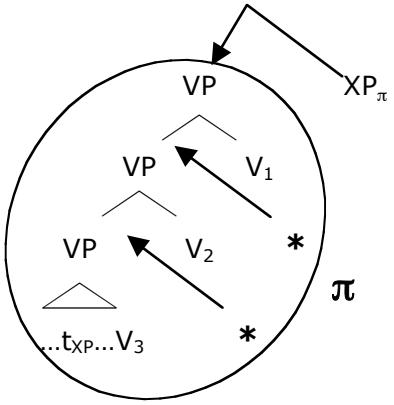
(11) Let XP be a syntactic category that is canonincally mapped into the prosodic category π upon extraposition (where π is either the phonological phrase or the intonational phrase in the following). The extraposition from NP will take XP as far as out of a prosodic constituent of the same cateogry π.

$(\dots XP \dots)_\pi \rightarrow (\dots t_i \dots)_\pi (XP_i)_\pi$ [Truckenbrodt 1995: 503]

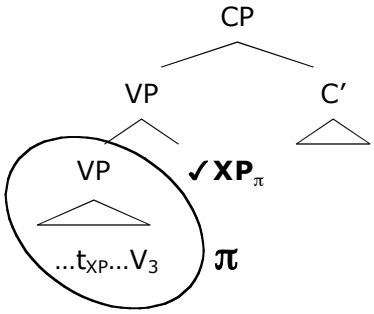
According to (11), an extraposed phrase of a particular prosodic category has to be placed immediately outside of the phrase (of the same prosodic category) where it originates. The constraint is violated if movement is either too short (i.e., if the extraposed phrase does not leave the prosodic phrase it originates in) or too long (i.e., if the extraposed phrase moves out of more than one prosodic phrase of the same category). The relevant part for our purpose here is the effects (11) has on movement that is too short.

This constraint together with the properties of prosodic phrasing in German then derives Haider's puzzle. As shown in (12), a series of clause final verbs/auxiliaries which belong to one clausal domain is mapped into one single prosodic phrase π, whereas a VP in topicalized position, even if not the topmost VP in its original position, constitutes a separate prosodic phrase.

(12) a. Clause final VPs



b. Topicalized VP



The evidence for this prosodic phrasing comes from various prosodic properties. First, following Nespor and Vogel (1989), Truckenbrodt assumes that phrasal stress provides direct evidence for the number of phonological constituents. In particular, Nespor and Vogel's (1989) claim is that there is a one-to-one correspondence between phrasal stress and phonological constituents. Since in cases such as (13)a, there is only a single phrasal stress in the phonological unit corresponding to the highest VP (i.e., the string including VP-adverbs, unscrambled objects, and all clause final verbs/auxiliaries), it can be concluded that this VP forms a single prosodic phrase (see also Bierwisch 1966, Selkirk 1984, Cinque 1993 for the same conclusion about prosodic phrasing in German). Second, non-final phonological phrases can be marked at the right edge by a high boundary tone (H^P) (see Truckenbrodt In press for further evidence for this tone). Since there are no intermediate boundary tones in the phonological unit corresponding to the highest VP, the phonological phrasing given in (13)a is again supported. Similarly, non-final intonational phrases

can be marked by a high boundary tone (H^I which is typically higher than H^P), indicating that the fronted embedded clause in (13)a constitutes a single intonational phrase. Finally, the examples in (13)b-d show that extraposed and topicalized phrases constitute independent prosodic phrases. First, both extraposed and topicalized phrases receive phrasal stress. Second, extraposed phrases are preceded by a high boundary tone (see (13)b), which shows that there is a prosodic phrase boundary between the extraposed phrase and the preceding string. Lastly, topicalized phrases are marked by a high boundary tone (see (13)c,d), which again shows that the topicalized phrase is a separate prosodic phrase, even if that constituent would not be an independent prosodic phrase in the base position.

(13) a.

				x					
[		x		x				]$_I$	
(*daß*	*der Peter*)$_\varnothing$	(*oft*	*Rezensionen*	*gelesen*	*haben*	*soll*)$_\varnothing$		*findet Paul komish*	
	H^P					H^I			
that	the Peter	often	reviews	read	have	should		finds Paul odd	

'Paul finds it odd that Peter is supposed to have often read reviews'

b.

		x						x
daß der Peter	(*oft*	*Bücher*	t_i	*gelesen*	*haben*	*soll*)$_\varnothing$	(*von Anaïs Nin*$_i$)$_\varnothing$	
						H^P		
that the Peter	often	books	t_i	read	have	should	by Anaïs Nin	

'that Peter is supposed to often have read books by Anaïs Nin'

c.

x				x	
(*Bücher*	*gelesen*)$_\varnothing$	(*hat*	*er*	*oft*)$_\varnothing$	
	H^P				
books	read	has	he	often	

'He often read books'

d.

x				x		
(*Bücher*	*gelesen*)$_\varnothing$	(*soll*	*er*	*oft*	*haben*)$_\varnothing$	
	H^P					
books	read	should	he	often	have	

'He is supposed to have often read books'

We thus have good reasons to conclude that all clause-final verbs/auxiliaries in a mono-clausal construction are part of one single prosodic phrase, whereas topicalized phrases are prosodic phrases on their own.

Returning now to Haider's puzzle, it follows from Truckenbrodt's constraint in (11) that extraposition cannot target any of the intermediate VPs in (12)a, whereas extraposition to the VP in topicalized position in (12)b is possible. Since extraposition has to leave the prosodic phrase it originates in, movement to any of the intermediate VPs in (12)a would be too short. Since the topicalized VP in (12)b, on the other hand, is a separate prosodic phrase, extraposition can attach to that VP.

Truckenbrodt's analysis is based on the idea that extraposition is a PF operation (hence subject to prosodic structure rather than syntactic structure). I would like to suggest a slightly modified alternative to Truckenbrodt's analysis which will keep the basic insight that extraposi-

tion is subject to prosodic factors, while maintaining the view that extraposition is syntactic movement. Following the copy theory of movement (see Chomsky 1995, Bošković 2001, Bobaljik 2002), syntactic movement leaves a copy and LF and PF then determine which copy to interpret and which copy to pronounce. Hence, although PF considerations have no influence on whether something moves or not in syntax, prosodic factors can be crucial for the determination of which copy will be pronounced—i.e., in a sense the overt position of an XP. This is essentially the view taken in Bošković (2001).

Bošković argues that in clitic chains, the choice of which copy to pronounce is determined by the prosodic structure. In particular, Bošković suggests that at PF, the higher copy of the clitic is chosen unless this copy is at odds with certain prosodic requirements. Essentially, the claim is that clitics need to attach to a host within a prosodic phrase and cannot be peripheral. Hence, if the higher copy of the clitic is at the edge of a prosodic phrase, PF will choose the lower copy since this will allow proper cliticization at PF. I would like to suggest here that extraposition describes exactly the opposite phenomenon. That is, the choice of which copy to pronounce in an extraposition chain is driven by a peripherality constraint—i.e., a constraint that makes sure that extraposed material does not interrupt a prosodic phrase. A reformulation of Truckenbrodt's constraint in terms of copy pronunciation is given in (14):

(14) Choice of copy in an extraposition chain:

> Pronounce the higher copy unless this copy interrupts the maximal parsing of the remaining material into a prosodic phrase.

(14) then accounts for Haider's puzzle under a syntactic extraposition approach. To see how this constraint works, consider the examples in (8) again (repeated here as (15)).

(15) a. **daß* *er* [$_{VP}$ [$_{VP}$ [*jenen* t_{REL}] *etwas* *gegeben*] [*die ihn darum gebeten haben*] *hat*]
that he [$_{VP}$ [$_{VP}$ [those t_{REL}] sth. given] [who him for.it asked have] has]
'that he gave something to those who asked him for it'

b. **daß* *er* [$_{VP}$ [$_{VP}$ [*jenen* t_{REL}] *etwas*] [*die ihn darum gebeten haben*] *gegeben* *hat*]
that he [$_{VP}$ [$_{VP}$ [those t_{REL}] sth.] [who him for.it asked have] given has]

c. *daß* *er* [$_{VP}$ [$_{VP}$ [*jenen* t_{REL}] *etwas* *gegeben*] *hat*] [*die ihn darum gebeten haben*]
that he [$_{VP}$ [$_{VP}$ [those t_{REL}] sth. given] has] [who him for.it asked have]

If extraposition targets the highest VP as shown in (16)a, PF will choose the higher copy of the extraposition chain. Pronunciation of this copy allows the remaining material to be maximally parsed into one prosodic phrase which is in accordance with (14).[7] If, on the other hand, extraposition targets an intermediate clause-final VP as shown in (16)b, pronunciation of the higher copy would interrupt the prosodic phrase formed by the object plus the clause-final verbs—i.e., the clause-final verbs/auxiliaries could not be maximally parsed into one prosodic phrase. Instead, the PF in (16)c would have to be chosen and pronunciation of the lower copy in this case would yield a PF which is identical to a PF of a structure without extraposition.[8]

[7] Following Truckenbrodt (1995), the indirect object in (16) constitutes a separate prosodic phrase. I leave aside here the question of whether it can also be part of the prosodic phrase including the direct object and the verbs.

[8] The current analysis therefore predicts that there could be syntactic or semantic effects of extraposition in cases where the "ex-

(16) a. [[[*those* [*who…*]$_{REL}$ *something given*]$_{VP}$ *has*]$_{VP}$ [*who…*]$_{REL}$]$_{VP}$ Syntax
(*those*)$_{\varnothing}$ ~~*who…*~~ (*something given* *has*)$_{\varnothing}$ (*who…*)$_{\varnothing}$ PF

b. [[[*those* [*who…*]$_{REL}$ *something given*]$_{VP}$ [*who…*]$_{REL}$]$_{VP}$ *has*]$_{VP}$ Syntax
*(*those*)$_{\varnothing}$ ~~*who…*~~ (*something given*)$_{\varnothing}$ (*who…*)$_{\varnothing}$ (*has*)$_{\varnothing}$ PF

c. [[[*those* [*who…*]$_{REL}$ *something given*]$_{VP}$ [*who…*]$_{REL}$]$_{VP}$ *has*]$_{VP}$ Syntax
(*those*)$_{\varnothing}$ (*who…*)$_{\varnothing}$ (*something given* ~~*who…*~~ *has*)$_{\varnothing}$ PF

Finally, (14) correctly predicts that pronunciation of the higher copy is possible in cases where a VP-layer is fronted (cf. (9), repeated as (17)). As we have seen in (13)c,d, the fronted XP constitutes a separate prosodic phrase and does not include the finite verb in C. Therefore, pronunciation of the higher copy as in (17)b does not interrupt a prosodic phrase and extraposition is visible at PF.

(17) a. [[$_{VP}$ *jenen etwas gegeben*] [*die ihn darum gebeten haben*]] *hat er noch nie*
[[$_{VP}$ those sth. given] [who him for.it asked have]] has he yet never
'He gave something to those who asked him for it'

b. [$_{CP}$ [[*those* [*who…*]$_{REL}$*something given*]$_{VP}$ [*who…*]$_{REL}$]$_{VP}$ [$_{C'}$ *has he never*]] Syntax
(*those*)$_{\varnothing}$ ~~(*who…*)~~$_{\varnothing}$ (*something given*)$_{\varnothing}$ (*who…*)$_{\varnothing}$ (*has he never*)$_{\varnothing}$ PF

The view that extraposition is restricted by prosodic considerations has various consequences. First, under the PF-copy approach, extraposition can be treated as a syntactic phenomenon. Second, either version of the PF approach correctly predicts that projections that can be shown to be parsed into separate prosodic phrases will allow extraposition. An interesting case illustrating this is clause union constructions involving lexical verbs such as *try, manage, begin*. In contrast to modal and auxiliary constructions, these contexts only optionally trigger a mono-clausal structure. This can be seen most clearly in (18)a. As argued in Wurmbrand (2001b), if long passive does not apply in a sentence such as (18)a (i.e., if the object receives accusative inside the infinitive rather than nominative in the matrix predicate), the construction is a non-restructuring infinitive. Non-restructuring infinitives involve an infinitival complement that is larger than VP (e.g., *v*P, TP, or CP) and do not show any mono-clausal properties. The important property of non-restructuring infinitives for the purpose of the discussion here is that these constructions generally prefer (though do not require) extraposition of the infinitive; if the infinitive is not extraposed, the sentence is only well-formed if the whole infinitival complement is set off by a clear prosodic break from the matrix clause (see (18)b).

(18) a. *weil* *den Wagen* *zu reparieren* *versucht* *wurde*
since the.ACC car to repair tried was
'since they tried to repair the car.'

b. *weil* || *den Wagen* *zu reparieren* || *versucht* *wurde*
since || the.ACC car to repair || tried was
'since they tried to repair the car.'

---

traposed" material remains in situ. I have not found any contexts which would allow us to test this prediction.

The special prosodic phrasing rule that maps all clause-final verbal elements into one prosodic phrase in German only applies within a single clause. Since the infinitive in (18) is part of a separate clause, it is not mapped into the same prosodic phrase as the matrix verb and auxiliary. The intonational break confirms that a non-restructuring infinitival complement constitutes a separate prosodic phrase. We then predict that intraposed non-restructuring infinitives such as (18) will allow adjunction (i.e., extraposition of material originating in the infinitival complement to their right edge). This is correct as shown in (19)a. The same effect can be seen in (19)b (which is from Bayer 2005). Scrambling of the lowest infinitival complement is only possible when the infinitive is a non-restructuring infinitive. In exactly these contexts, adjunction to the infinitival complement becomes possible. Prosodically, there is again a clear intonational break between the infinitive and the matrix clause indicating that the infinitival complement constitutes a separate prosodic domain.[9]

(19) a. *weil* || *den Wagen zu reparieren* || [$_{\text{Rel.cl}}$ *der* *schon* *seit Tagen*
since || the.ACC car to repair || [$_{\text{Rel.cl}}$ which already for days

in der Garage steht] *endlich versucht wurde*
in the garage stands] finally tried was
'since they finally tried to repair the car which has already been in the garage for days'

b. *Ich habe* || *mich* ~~*dafür*~~ *zu entscheiden* || *dafür*
I have || myself there.for to decide || there.for

schon mehrmals *erfolglos* t_{INF} *versucht*
already more.than.once successlessly t_{INF} tried
'I have already more than once tried without success to decide on it'

Lastly and most importantly for the discussion here, the PF approaches outlined above show that Haider's conclusion (the claim that "…the 'no-intervener' property is clear counterevidence to any analysis of cluster construction that operates with V-projections (or higher ones) as minimal building units of clusters" [Haider 2003: p. 94]) is not viable. While one might perhaps have certain reservations against PF-accounts of movement such as (11), prosodic factors on phrasing are well-established empirically and have an intuitive sense across frameworks (e.g., the fact that heavy elements such as relative clauses gravitate to edges is observed in almost all descriptive and theoretical frameworks). Thus, the account proposed here clearly shows that Haider's puzzle can be accounted for under a VP-complementation approach and that adjacency does not require us to assume a complex head structure, hence eliminating the argument against VP-complementation. Indeed, the PF account proposed here may even be superior if it can reduce the differences between English and German to independently observable differences in prosody.

[9] As pointed out by Schmid, Bader, and Bayer (2004), there is a preference for parsing structurally ambiguous intraposed infinitives into mono-clausal structures whenever possible (i.e., when they do not show any biclausal diagnostics). While I do not have an explanation for why this preference exists, it does not pose a problem for the account presented here. The important point of the present analysis is that as soon as it is guaranteed that the infinitive is a separate clausal domain (e.g., by intonation or by dislocating the infinitival complement as in (19)), the analysis correctly predicts that adjunction to the infinitive becomes possible. A similar question has been raised by Hans-Martin Gärtner, namely why mapping into separate prosodic phrases cannot be forced in mono-clausal configurations such as (15) by, for instance, stressing or focusing parts of the verbal elements. I do not have an answer to this question here.

In the rest of this article, I will strengthen this conclusion and show that VP-complementation is not only an option for the representation of clause union constructions, but that it is in fact strongly favored by a number of empirical facts.

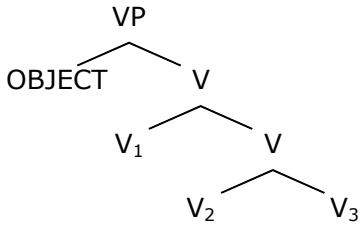
4. EVIDENCE FOR VP-COMPLEMENTATION[10]

In this section, I will discuss a number of syntactic properties (constructions lacking adjacency among the elements of a clause union construction, constructions in which clause union properties are licensed without complex head formation, constituency tests indicating that the parts of a cluster are XPs rather than heads, modification and event structure properties, and infinitival nominalizations), all of which point to a VP-complementation structure rather than a complex head analysis. I will argue that the sum of these properties provides evidence for a VP-complementation analysis since in addition to descriptive adequacy (which perhaps can also be achieved under a complex head approach by certain theoretical amendments and additional assumptions), the VP-complementation approach has the advantage of explanatory adequacy—all the properties discussed are predicted to be the way they are if one assumes VP-complementation, whereas they, although perhaps derivable, are not a priori expected under the complex head approach.

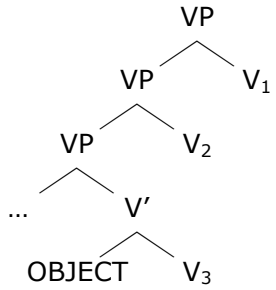
4.1 Lack of adjacency and excorporation

To begin with, let us compare the complex head approach and the VP-complementation approach again side by side.

(20) a. Complex head approach



b. VP-complementation approach



As we have seen in the previous section, the complex head approach (together with a prohibition against adjunction to X˚s) predicts that the verbs of a cluster will be adjacent to each other. Under this approach, in particular, if the complex head is a base-generated V-V compound, we would also expect that the verbs of a cluster form a lexical unit that cannot be separated by syn-

[10] As mentioned in the introduction, I will not be able to compare the VP-complementation approach with complex head analyses in different frameworks. In particular, complex predicate analyses in the HPSG framework are based on very different premises about complex head formation, syntactic structure, and the representation of syntactic relations, which essentially makes a direct comparison of a VP-complementation approach with an HPSG style complex head analysis impossible. Many of the problems discussed in this section have been addressed in the HPSG literature (see e.g. Kiss 1995, Bouma and Noord 1997, S. Müller 1999, 2002, 2006), however, the solutions suggested there cannot be translated directly into the GB framework and hence cannot be used to 'save' GB-style complex head analyses.

tactic movement. This expectation, however, is not borne out. In what follows, we will see a number of constructions in which the verbs of a cluster are separated from each other—i.e., cases where adjacency does not hold.

One such case has already been given in (9), repeated here as (21)a. Similarly, (21)b shows that the verbs of a 'cluster' are clearly separated in V2 contexts—i.e., when the finite verb moves to C.

(21) a. [[$_{VP}$ *jenen etwas gegeben*] [*die ihn darum gebeten haben*]] *hat er noch nie*
[[$_{VP}$ those sth. given] [who him for.it asked have]] has he yet never

b. [$_{CP}$ *Er* [$_{C'}$ *hat* [*ihm etwas gegeben* t_{AUX}]]
He has him something given t_{AUX}
'He has given him something'

Let us start with (21)b. A common assumption to account for the separation of the verbs under the complex head approach is to allow excorporation from lexical heads. I will not evaluate whether this is a desired move or not and what it entails for the grammar of German in general, but simply note that under the VP-complementation approach no such mechanism is necessary.[11] Since the verbs never form a complex head, it is expected that they can move independently in syntax.

A more serious problem for the complex head approach is raised by examples such as (21)a and (22) (see also (13)d in the previous section). In these cases, the lowest verbs have undergone topicalization to Spec,CP. Furthermore, in (21)a and (22)b, the objects have been carried along as well.

(22) a. [*Erklären*]$_{XP}$ *müßte man das können*
[Explain]$_{XP}$ must one that can
'One ought to be able to explain that' [Haider 2003: 103]

b. [*Einen Millionär einladen*]$_{XP}$ *hätte man sollen*
[A.ACC millionaire invite]$_{XP}$ had one should
'One should have invited a millionaire.'

Before discussing the derivation of this kind of example in a complex head approach, note first that under the VP-complementation structure in (20)b, this is exactly what we would expect: the lower verb forms a full-fledged VP, with all of the verb's arguments projected in that VP. Hence there is a constituent of the form [OBJ … V] which can be moved to topicalized position.

[11] It is sometimes claimed that excorporation is needed independently in languages like German, since particles (such as *up* in *eat up*) are obligatorily stranded in V2 contexts. However, there are numerous analyses that treat particle verb combinations as complex syntactic structures rather than as lexical V heads, exactly to avoid the excorporation problem (see, for instance, Kayne 1985, Guéron 1987, Hoekstra 1988, Mulder 1992, den Dikken 1995, Zeller 1997, 1999, Wurmbrand 1998). These type of analyses have the advantage that it becomes possible to account for the difference between particle verbs (obligatory stranding of the particle) and prefix verbs which cannot be split up by V-movement—i.e., prefix verbs do indeed form an inseparable unit with the verb. Assuming that both types of P-V combinations are lexical V heads raises the question of how the different behavior under V2 movement can be explained. If on the other hand particle verbs are not complex V°s, the difference follows. By the same logic, however, then verb clusters should also not be complex V°s.

The problem arising for a complex head approach has to do with the constituency of the fronted material. The standard claim regarding V2 in German is that Spec,CP can only be occupied by a maximal projection (head movement to Spec,CP is excluded) and the material in Spec,CP has to form a single constituent.[12] Under these assumptions, the fronted strings in (21)a and (22) must be XPs. But since under the complex head approach, the lower verb starts out as part of a complex lexical or syntactic V, the question arises of how the lower verb or the lower verb together with the object can end up in Spec,CP as a maximal projection. The problem is most evident in the constructions with three verbal elements such as (22), since in these cases, the finite verbs occur in C, the middle verbs (V_2 in (20)a) in clause-final position, and the lowest verbs in topicalized position.

There seem to be two options to account for examples such as (22) (by maintaining the standard claim that the fronted string constitutes one single XP). First, as suggested to me by a reviewer, one could assume that complex head formation is an optional process and that (22) does not involve a complex head structure at all (thus, (22) would essentially be a case of VP-complementation). I will discuss this option in detail in section 4.2. Second, one could assume that the whole VP is fronted in (22), and that that VP includes a complex head structure, however, the finite verb and the middle verb have left the cluster (and the VP) via excorporation before the VP is topicalized.[13] This structure is illustrated in (23).

(23) a. [[*Erklären* t_{MOD} $]_{V^\circ}$ $]_{VP}$ *müßte* *man* *das* [t_{VP} *können* $]_{?P}$
[[Explain t_{MOD} $]_{V^\circ}$ $]_{VP}$ must one that [t_{VP} can $]_{?P}$

b. [*Einen Millionär* [*einladen* t_{MODAL} t_{AUX} $]_{V^\circ}$ $]_{VP}$ *hätte* *man* [t_{VP} *sollen* $]_{?P}$
[A.ACC millionaire [invite t_{MODAL} t_{AUX} $]_{V^\circ}$ $]_{VP}$ had one should $]_{?P}$

These structures, however, raise three questions. First, as argued in Haider (1990, 1993, 2005) and Wurmbrand (2004b), fronting of a 'headless' constituent—i.e., a constituent whose head is a trace—is illicit. Some motivation for this constraint on fronting in German is given in (24) (for further evidence see the works mentioned above). In particle verb constructions such as (24)a, the particle is obligatorily stranded inside the VP when the verb moves to C (cf. (24)b). As shown in (24)c, VPs can be fronted in German, however, only when the VP also contains the verb. If the verb has left the VP, as required in V2 constructions, fronting of the remnant VP becomes impossible (see (24)d).

[12] There are certain constructions in German which appear to be verb third constructions—i.e., constructions where two constituents occur in front of the finite verb (see for instance S. Müller 1999, 2003). However, various approaches have been provided which capture these examples under the standard V2 analysis—i.e., by maintaining the claim that there is only a single XP position before the finite verb (e.g., G. Müller 1998, Fanselow 2002 suggest remnant VP structures, Haider 1982, Wunderlich 1984 suggest small clause structures, S. Müller 2005 proposes a non-remnant VP structure with an empty verbal head).

[13] According to Haider (2003), examples like (22)a are derived by topicalizing "a part of the cluster". I do not see how this is possible in the framework he uses, where Spec,CP can only host XPs and not heads (if X° categories, in particular, parts of a complex head could undergo fronting, it seems we would achieve massive overgeneration ; e.g., how could the system then exclude parts of compounds from undergoing fronting?). Furthermore, without assuming multiple excorporation (see the text) it would not be clear how (22)b could be derived since the object and the lowest verb do not form a constituent in the structure in (20)a.

(24) a. *weil* *Hans* *seinen Bruder* *angerufen* *hat*
since John his brother up.called has
'since John called his brother'

b. *Gestern* *rief* *der Hans* [$_{VP}$ *seinen Bruder* *an* t_V]
yesterday called the.NOM John [$_{VP}$ his.ACC brother up t_V]
'John phoned his brother yesterday.'

c. [*Seinen Bruder* *angerufen*]$_{VP}$ *hat* *nur der Hans* t_{VP}
[his.ACC brother up-called]$_{VP}$ has only the John t_{VP}
'Only John called his brother.'

d. *[*Seinen Bruder* *an* t_V]$_{VP}$ *rief* *der Hans* *gestern* t_{VP}
[his.ACC brother up t_V]$_{VP}$ called the John yesterday t_{VP}
'It was yesterday that John phoned his brother.'

Note that the structure in (24)d is exactly parallel to the structures suggested in (23) to account for fronting of the lower verb in multiple verb constructions under the complex head approach. The fact that fronting of a VP whose head is a trace is impossible hence questions the availability of structures such as the ones in (23).

The second problem raised by an analysis involving excorporation operations as in (23) is that under these assumptions the account for the obligatory adjacency in a verb cluster (which is the major motivation for assuming complex head formation in many approaches) seems to be lost. Assuming excorporation operations such as the ones illustrated in (23)a, we would also expect these operations to be possible when topicalization does not occur. That is, (25)b should be a possible structure for the unfronted example in (25)a.[14] This, however, would then incorrectly predict that it should be possible to separate the two verbs in (25)a by adjuncts or extraposed material. As shown in (25)c, the adjacency requirement holds in these examples as it did in previous examples.

(25) a. *Man* *hätte* *einen Millionär* *einladen* *sollen*
One had a millionaire invite should
'One should have invited a millionaire.'

b. *Man* *hätte* [[*einen Millionär* *einladen* t_{MODAL} t_{AUX}]$_{VP}$ *sollen*]$_{?P}$
One had [[a millionaire invite]$_{VP}$ should]$_{?P}$

c. *Man* *hätte* *einen Millionär* *einladen* (**nicht/*oft/*xyz*) *sollen*
One had a millionaire invite (*not/*oft/*xyz) should

Finally, the third question for the structures in (23) has to do with the scope properties of these examples. (22)b, repeated here as (26)a is unambiguous: the modal *should* must take scope over the indefinite object. The same situation holds in the raising construction in (26)b where the topicalized material includes the infinitive plus the nominative argument (see Bobaljik and Wurm-

[14] One could, of course, postulate that these excorporation operations only occur when topicalization takes place. The obvious question, however, then is how to motivate and restrict these syntactic movement operations.

brand 2005, Wurmbrand 2004a, 2004b for discussions of the scope properties of these constructions). Since the arguments start out higher than the modal in the complex head approach (see (20)a), the question is how arguments can ever take low scope with respect to any of the verbs of a cluster and why they cannot take scope over the modal or raising verb in (26), given that, under the derivation in (23), the fronted XP contains traces of these scopal verbs.

(26) a. [*Einen Millionär* *einladen*]$_{XP}$ *hätte* *man* *sollen*
[A.ACC millionaire invite]$_{XP}$ had one should
'One should have invited a millionaire.'

i. We should have done the following: invite a millionaire
ii. *There is a (specific) millionaire who we should have invited.

b. [*Ein Außenseiter* *zu gewinnen*]$_{vP}$ *scheint* *hier* *eigentlich* *nie*
[An.NOM outsider to win]$_{vP}$ seems here actually never
'An outsider never actually seems to win here.' [Meurers 1999, 2000]

i. It never seems to be the case that an outsider wins here.
ii. *There is a (specific) outsider and he never seems to win here.

Thus, a complex head account according to which examples like (21) or (22) involve fronted VPs which have been (partially) vacated by means of excorporation of the stranded verbs does not seems to be a viable option. Again, no problems arise under the VP-complementation approach where the verbs of a multiple verb construction never constitute a V-V unit. In the next section, I will discuss the second option pointed out above, namely the idea that complex head formation is an optional process.

4.2 Lack of cluster formation in clause union constructions

In the previous section, we have seen that certain multiple verb constructions do not require adjacency. In this section, I will reinforce this claim by showing that even in the clear presence of clause union properties, adjacency or complex head formation is not required to license these properties. The conclusion that complex head formation cannot be seen as a condition for clause union/restructuring will have three important consequences: i) a non-complex head analysis such as the VP-complementation analysis suggested here must be available in the grammar to account for clause union properties; ii) an approach involving optional complex head formation for clause union constructions is ad hoc in the sense that it cannot be tied to any independent property of the relevant constructions, and thus lacks any predictive force; and iii) complex head formation becomes superfluous.

Let us start by looking again at two of the crucial cases discussed in the previous section ((27)a is repeated from (25)c and (27)b is repeated from (22)b/(26)a). The crucial point illustrated by these examples is that in (27)a the verbal elements must be adjacent and cannot be separated by any intervening material. Assuming that this inseparability is due to obligatory complex head formation, it is then not expected that the verbal elements in this constructions may in fact be separated by moving parts of the verbal complex (cf. (27)b).

(27) a. *Man hätte einen Millionär einladen (*nicht/*oft/*xyz) sollen*
One had a millionaire invite (*not/*oft/*xyz) should
'One should have invited a millionaire.'

b. [*Einen Millionär einladen*]$_{XP}$ *hätte man sollen*
[A.ACC millionaire invite]$_{XP}$ had one should
'One should have invited a millionaire.'

To deal with this problem, one might suggest that cluster formation does not always apply in multiple verb constructions. That is, verbs can (and must) cluster as complex heads in cases such as (27)a but they can also project as independent VPs. If they project as non-clustering VPs, fronting as in (27)b is possible. As we have seen in section 3.2, the optionality of clustering is well justified for lexical restructuring constructions such as (18), which can be parsed either as restructuring or as non-restructuring constructions. Depending on the choice, however, the outcome shows different syntactic and prosodic properties. If the former option (restructuring) is chosen, clause union properties are found and adjacency among the verbal elements is required (however, only when the verbs are in the same prosodic phrase); if the latter option is chosen, clause union properties are not found and adjacency among the verbal elements is not required.

Postulating structural optionality for the modal/auxiliary constructions in (27), however, does not seem to be motivated since these constructions are generally considered to be non-ambiguous. More specifically, in contrast to cases such as (18), whether a cluster is formed or not according to this view does not correlate with clause union/restructuring. Recall that long passive is only licensed in mono-clausal constructions. According to the complex head approach, unification of the verbs' argument structures (i.e., complex head formation) is required to account for the Case properties of long passive constructions.[15] However, as shown in the following examples, there are clear instances of long passive constructions which do not seem to involve any complex head formation. The examples in (28)a,b involve long passive and extraposition of the infinitive, the example in (28)c involves long passive and topicalization of the infinitive.[16] Similar facts have been noted for Alemannic by Brandner (2005) and for Old High German by Demske (2005). Importantly, in all these cases, the infinitive and the matrix verb clearly do not form a cluster.

(28) a. *daß der Wagen* t_{EXTR} *vergessen wurde* [*zu reparieren*]$_{EXTR}$
that the.NOM car t_{EXTR} forgotten was [to repair]$_{EXTR}$
'that they forgot to repair the car' [Bayer and Kornfilt 1990:22]

b. *...die hier versucht wurden* [*möglichst kurz zusammenzufassen*]
which here tried were [as.DEG.as possible short to.summarize]
'which they tried to summarize here in the shortest way possible'

Source: http://www.cis.tugraz.at/siis/03studium/mag/MagAllg.htm

[15] See below for a discussion of what it would mean to give up this assumption.

[16] Note that many German speakers (including myself) find long passive in extraposition contexts not fully grammatical. However, in a Google search of the string *versucht wurden* 'tried were.PL' (June 2003) 26 cases of long passive and extraposition were found (the results of the search are available at: http://wurmbrand.uconn.edu/research/files/long-passive.pdf). While Google hits certainly have to be taken with some caution, the number for this rather specific search item might be taken to indicate that there is at least variation among German speakers.

c. [*Zu reparieren*]$_{VP}$ *wurden* *nur blaue Autos* *vergessen*
[To repair]$_{VP}$ were only blue cars forgotten
'They only forgot to repair blue cars.'

Examples such as (28)c, where the lowest verb appears separated from the rest of the 'cluster' in a position reserved for maximal projections, would hence also be a case where complex head formation does not take place (as suggested for (27)b).[17] Thus, clause union/restructuring does not distinguish between cases that must involve clustering and those that do not involve clustering, or in other words, adjacency or overt clustering is not a requirement for clause union. If, however, complex head formation is not a prerequisite for restructuring/clause union and hence does not need to occur in clause union constructions, a proponent of a complex head approach is faced with three important questions: i) how are clause union/restructuring properties accounted for in the absence of complex head formation (cf. (28)); ii) how does the grammar 'know' whether clustering must take place or not (cf. (27)a vs. (27)b); and iii) do we need complex head formation at all. I will discuss these questions in turn.

As for the first question—how are clause union/restructuring properties accounted for in the absence of complex head formation—one would presumably need a mechanism similar to the one suggested in this paper (i.e., long passive is not licensed by argument structure merger but rather by the lack or ineffectiveness of a structural case assigner in these constructions). This, however, then means that a crucial piece of motivation for complex head formation disappears and that the process of complex head formation becomes superfluous (at least regarding the account of clause union properties).

Let us then turn to the second question. If it is possible to create restructuring constructions without complex head formation in cases such as (28) and (27)b (i.e., a structure where the lowest verb projects an independent VP), what would prevent creating the same structure in cases such as (27)a? Recall that under the view whereby adjacency is due to complex head formation, cluster formation must be assumed to be obligatory in (27)a in order to account for obligatory adjacency. Thus, if one wants to maintain this view (in particular a base-generated complex head approach), one needs to come up with a system that predicts why cluster formation is not necessary in (27)b but obligatory in (27)a. Since in these cases complex head formation cannot be diagnosed by clause union, it seems that this approach is faced with some fatal circularity: the verbal elements in a multiple verb construction must be adjacent when clustering takes place; clustering takes place when the verbal elements in a multiple verb construction must be adjacent. This is clearly not a desirable situation.

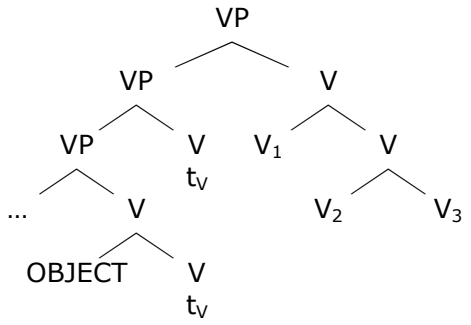
While I believe that these considerations and the facts discussed in the last two sections pose a rather serious problem for the base-generated and derived complex head analyses in (2), they do not a priori exclude a process of syntactic V-to-V incorporation as in (5). I will turn to a discussion of this approach which will lead to the third question raised above (Do we need complex head formation at all?) in the next subsection.

[17] If a base-generated complex head analysis were to be maintained for these examples, the same questions as pointed out in the previous section would arise. That is, one would be forced to either allow massive excorporation (e.g., to make sure that the extraposed string in examples such as (28)b excludes the matrix verbs but includes the most embedded verb plus the adverbial) or to give up the idea that movement such as topicalization and extraposition targets constituents.

4.3 Do we need complex head formation at all?

As mentioned in section 2, another approach to complex predicates is a mixed approach—that is, a structure as in (29) which involves full VP-complementation followed by syntactic head-to-head movement.

(29) VP-complementation & incorporation



This approach is, in fact, quite popular in many accounts of Dutch verb clusters. Before discussing Dutch, however, I would first like to illustrate whether this approach can be applied to the German facts discussed so far. To do that, recall the restructuring examples involving movement of the lowest VP such as in (27)b and (28). If incorporation takes place in overt syntax, the same problems arise as for the other two complex head approaches (i.e., one would need to assume excorporation to derive (27)b and (28)). Another option would be to assume that incorporation takes place covertly. This would have the advantage that there is a VP constituent including the lowest verb's arguments. Hence the examples in (27)b and (28) could be derived. The question arising, however, is how covert incorporation applies in these constructions and why it occurs at all. To achieve the structure in (29) in cases such as (28) one would need to assume that the moved VPs reconstruct at LF and the lowest verb then undergoes V-to-V movement. This procedure, however, is questionable since fronted XPs are typically frozen for further movement (see Barss 1986, Sauerland 1998, Bobaljik and Wurmbrand 2005, Wurmbrand 2001a, 2004a). Thus, one would have to assume that the freezing effect only applies to XPs but not to heads. Furthermore, it seems somewhat obscure why one would assume covert incorporation at all. If complex head formation (whether overt or covert) is a necessary condition for clause union, we seem to run into a timing paradox. If the licensing operation only applies at LF, how would overt clause union properties such as long passive be licensed (see also Roberts 1997 for raising this point)? One possible solution would be to follow Roberts (1997) and assume that incorporation takes place overtly in (29) but that, at least in certain constructions, the lower copy of the moved verb is pronounced. Under these assumptions, the examples in (27)b and (28) would then be compatible with an incorporation structure.

In contrast to the other complex head approaches, however, this account now does not capture the adjacency problem anymore. Consider again (8)a,b (repeated here as (30)) where a relative clause is attached to the lowest VP. Assuming that the lowest verb ('asked') undergoes movement to the higher auxiliary, there would be two copies of *gebeten* 'asked' at PF—one in the base position as in (30)a and one in the landing position as in (30)b. Crucially, both options lead to ungrammaticality.

(30) a. **daß* *er* [$_{VP}$ [$_{VP}$ [*jenen* t_{REL}] *etwas* *gegeben*] [*die ihn darum gebeten haben*] *hat*]
that he [$_{VP}$ [$_{VP}$ [those t_{REL}] sth. given] [who him for.it asked have] has]
'that he gave something to those who asked him for it'

b. **daß* *er* [$_{VP}$ [$_{VP}$ [*jenen* t_{REL}] *etwas*] [*die ihn darum gebeten haben*] *gegeben* *hat*]
that he [$_{VP}$ [$_{VP}$ [those t_{REL}] sth.] [who him for.it asked have] given has]

To rule out the illicit configurations in (30) and to account for Haider's puzzle, this approach would thus need to be supplemented with appropriate additional assumptions (e.g., a prosodic account such as the one proposed here). Since this mixed VP-complementation plus incorporation approach does not automatically account for the adjacency problem, and the clause union properties can also be accounted for without this incorporation process, I conclude that while nothing seems to exclude this form of 'covert' incorporation, nothing seems to require it either, and hence postulating a structure such as (29) would need to be further motivated.

This, lastly, leads us to the third question raised above: Do we need syntactic complex head formation at all? An answer to this question is not straightforward, since it depends crucially on one's theoretical background assumptions. It is therefore not surprising that very different conclusions have been reached in the literature regarding this question. I will not be able to compare all the approaches here (see Wurmbrand 2005 for an overview), but simply recapitulate the argument for (derived) complex head formation and point to the major analyses which do not involve complex head formation. I will conclude that while it is possible to make use of incorporation as in (29) to derive certain word order alternations, the facts can also be accounted for without complex head formation.

One of the major arguments for (derived) complex head formation as in (29) comes from the properties of certain Dutch verb clusters. As shown in (31)a, the order of verbs in this example is as in English—the auxiliary precedes the participle. However, in contrast to English, arguments and predicates associated with the participle must precede it. This latter property has traditionally been taken as evidence for the claim that Dutch is a head-final language—i.e., a language where heads follow their complements. Under a head-final structure for Dutch, the basic order of verbs is thus the reversed English order—i.e., participles precede auxiliaries. Under these assumptions, (31)a must be derived. Typically, word order alternations are derived by movement. Thus, in (31)a *gebeld* 'called' undergoes movement to the right of the auxiliary. As for the question of whether this movement is (remnant) XP-movement or X° movement, the following argument for the latter has been provided (den Besten and Rutten 1989, Rutten 1991, den Besten and Broekhuis 1992, Broekhuis et al. 1995, and many others). As shown in (31)b, particles such as *op* 'up' cannot undergo movement to the left. Assuming that particles are immobile (i.e., that they cannot vacate the VP), *gebeld* 'called' in (31)a cannot be a remnant VP but can only be the verb.

(31) a. dat Marie {haar vader} toen toch {haar vader} op heeft gebeld
that Marie {her father} then ADV {her father} up has called
'that Marie then HAS called her father'

b. dat Marie haar vader {*op} toen toch {op} belde
that Marie her father {*up} then ADV {up} called
'that Marie then did call her father'

Given the assumptions stated above, we would hence have an argument for head movement in these verb clusters in Dutch. However, as indicated above, the argument relies on assumptions that are not necessarily shared by different researchers. First, the argument for head-movement is based on a head-final structure for Dutch. The situation would be quite different if a head-initial structure is assumed for Dutch (see for instance Zwart 1996, 1997, Koopman and Szabolcsi 2000). To derive the English-style word order of the verbs, there would be no need for verb (or VP) movement at all under a head-initial approach, since the verbs already appear in their surface order (but there would, of course, need to be many other movement operations to insure that objects, particles etc. appear before the verbs).

Second, the argument in (31) is based on the assumption that particles cannot undergo any kind of movement. However, while examples such as (31)b show that particles cannot move across a VP-adverb, they do not show that particles cannot undergo movement at all. More specifically, if it is assumed that particles are able to move in principle, however, that they cannot cross any other (phrasal) material (see den Besten and Broekhuis 1992, Broekhuis et al. 1995 for claims along these lines), (31)a could involve a derivation where the particle moves out of the VP string-vacuously and the remnant VP *gebeld* 'asked' is then moved to the right.[18] Hence, complex head formation would not be necessary to derive examples such as (31)a.

Now what about adjacency again? Both of these alternatives to derived complex head formation do not automatically predict that the verbs in (31)a must be adjacent.[19] Although the details would need to be tested, I would suggest that adjacency could be explained by a mechanism similar to the one suggested in this paper for German. That is, adjunction—whether via movement or via base-generation—is only possible to the edge of a prosodic phrase and cannot interrupt a prosodic phrase. That such a constraint is necessary independently of the issue of adjacency within a verb cluster is illustrated in (32) (these examples are from van Riemsdijk 1998). Let us assume a head-final structure for Dutch. As shown in (32)a, PPs such as 'with a spoon' can appear at the right edge of a clause—i.e., in extraposed position. In inversion constructions such as (32)b-d (i.e., constructions in which the verbs appear in the English order), these PPs must either occur in their base position (cf. (32)b), or at the very right of the whole cluster (cf. (32)c). Crucially, extraposition to the right of the lower VP as in (32)d is impossible.

(32) a. *dat hij probeert* [[$_{VP}$ *de emmer* t_i *leeg* *te scheppen*] *met een lepel*$_i$]
that he tried the bucket empty to scoop with a spoon
'that he tried to scoop the bucket empty with a spoon.'

b. *dat hij* [*de emmer met een lepel leeg* t_i] *probeert* [*te scheppen*]$_i$
that he the bucket with a spoon empty tried to scoop
'that he tried to scoop the bucket empty with a spoon.'

c. *dat* [*hij de emmer leeg probeert te scheppen*] *met een lepel*
that he the bucket empty tried to scoop with a spoon
'that he tried to scoop the bucket empty with a spoon.'

[18] The claim that particles can undergo at least short movement is supported by constructions where the particle appears to the left of a stranded preposition (see Zwart 1996, 1997).

[19] It is, in fact, not entirely correct that the verbs of a cluster must be adjacent in Dutch. Certain 'small' elements, namely particles and adverbs such as *groen* 'green' (see Neeleman 1994) may intervene between the verbs of a cluster. If one assumes a phrasal analysis for these elements (see fn. 11), a complex head analysis seems to be untenable for Dutch verb clusters.

d. **dat* *hij* [[*de emmer* t_{PP} *leeg* t_i] *met een lepel*] *probeert* [*te* scheppen]$_i$
that he the bucket empty with a spoon tried to scoop
'that he tried to scoop the bucket empty with a spoon.'

Note that the problem here is not the lack of adjacency *within* a cluster—in (32)d, the verbs of the cluster are adjacent to each other. Hence, a complex head analysis does not automatically account for these facts. Van Riemsdijk 1998 accounts for this phenomenon by assuming an adjacency constraint on inversion. That is, (32)d is blocked since the PP intervenes between the base position of the infinitive and the higher verb. In Wurmbrand and Bobaljik (2005), we argue that this account creates a problem of "look-ahead" which can be avoided under a similar PF-copy account as suggested for German in this paper. Although the details need to be further investigated, the idea would be that pronunciation of the higher copy of *met een lepel* 'with a spoon' as in (32)d is prohibited since it would be within a prosodic phrase (assuming again that the verbs of an inversion construction are mapped into a single prosodic phrase).

To conclude, while a process of syntactic incorporation is an option to derive the word orders in certain verb clusters in Dutch,[20] there are also other mechanisms which are equally successful in deriving the different word orders. The choice among these possible analyses will crucially depend on one's assumptions and theoretical commitments regarding directionality (head-final vs. head-initial), the structure of particle verb constructions (P+V head vs. phrasal PP+V or small clause structure), and the question of whether word order alternations as attested in verb clusters are the result of syntactic movement or PF-linearization (see Haegeman and van Riemsdijk 1986, Schmid and Vogel 2004, Wurmbrand 2004c, 2004e, 2005 for the latter view). Since these are rather controversial issues, I will leave this question open here. However, it is important to note that even if a syntactic incorporation approach turns out the be the best way to account for certain Dutch verb clusters, this form of complex head formation has a very limited function. As we have seen in the previous sections (see also the next three sections for further arguments), the basic structure of clause union/restructuring constructions must involve full VP complements (in particular, the lowest verb must be the head of an independent VP which includes the arguments of that verb). Furthermore, since complex head formation (or the lack thereof) has no effect on the clause union properties this process cannot be seen as a condition on clause union/restructuring. Thus, the only purpose this form of complex head formation would have is to derive the correct word orders.

4.4 Adverbial modification

As discussed in section 3.1, a crucial piece of motivation for complex head approaches is the difference between languages like English and German with respect to the positions where adverbs and other modifiers can be placed (see (6), repeated here as (33)).

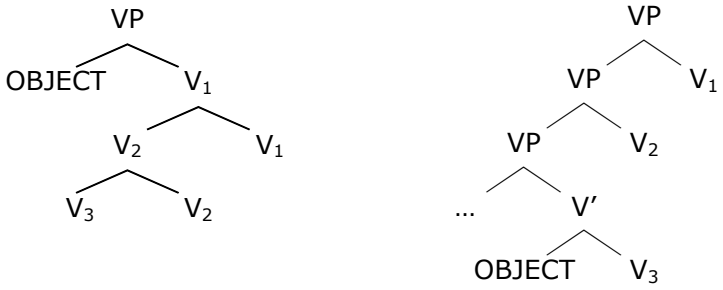
[20] It is important to point out that a complex head analysis cannot be extended to the other verb cluster languages Afrikaans, Swiss German, and West Flemish, as in these languages the verbs can be separated by clearly phrasal material such as direct and indirect objects.

(33) a. *The new theory certainly may possibly have indeed been badly formulated.*
[Haider 2003 citing Quirk et al. 1986)

b. *daß die Theorie* […] *schlecht formuliert* (*) *worden* (*) *sein* (*) *mag*
that the theory badly formulated been be may
'that the theory may have been badly formulated'

If German is assumed to have the structure in (34), so proponents of complex head approaches argue, it follows that adverbs cannot appear between the verbs of a cluster, since there is no VP where they can attach to. If, on the other hand, German mono-clausal constructions project VP-complementation structures, additional assumptions are necessary to account for the prohibition against adjoining material to the lower VPs.

(34) a. Complex head approach b. VP-complementation approach (OV)



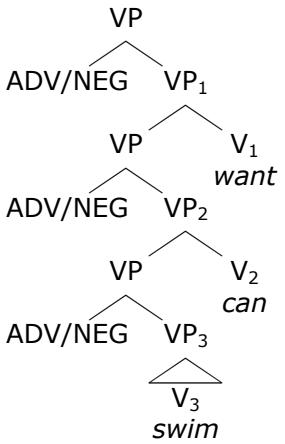
In section 3.2, I have offered an account of the prohibition against extraposition to intermediate VPs. Note, however, that under both approaches in (34) it is necessary to exclude right adjunction of adverbs in German, since, as shown in (35), clause-final adverbs are impossible in German. A general prohibition against right-adjunction of adverbs in German, however, then also accounts for (33) without further assumptions.

(35) **weil Leo schwimmen gehen will oft/nie/selten*
since Leo swim go wants often/never/rarely
'since Leo often/never/rarely wants to go swimming'

Comparing the two structures in (34), there is one important difference in addition to the position of the object: in (34)a, there is only one VP which can function as an adjunction site, whereas there are multiple attachment positions in (34)b (assuming again that adjunction only targets XPs). I will argue in this and the next section that the distribution of adverbials and modifiers provides further evidence for multiple VPs rather than a single VP.

Let us start with the structure in (34)b. Assuming that syntactic structure corresponds to the interpretation, it is predicted that adverbs preceding multiple verbs in a mono-clausal configuration can modify different parts of the verbal complex, depending on where exactly they are attached (see (36)).

(36) Adverb attachment sites in VP-complementation structure



Thus, the structure in (36) correctly predicts that examples such as (37) are ambiguous. If *oft/nicht* attach to the highest VP, *oft/nicht* take highest scope (i.e., they modify the highest predicate); if they attach to the middle VP, they modify the middle predicate, and if they attach to the lowest VP, they only modify the lowest predicate. Thus, the scope of adverbs is determined compositionally.

(37) a. *weil Leo oft gewinnen will*
since Leo often win want
'since Leo often wants to win.'
'since Leo wants to often win.'

b. *dass Tim nicht schwimmen können will*
that Tim not swim can wants
'that John does not want to be able to swim'
'that John wants to not be able to swim'
'that John wants to be able to not swim'

To account for the ambiguity of (37) under the complex head approach, on the other hand, compositionality would have to be given up. That is, structural relations such as sisterhood do not determine the interpretation. Rather, additional mechanisms are necessary to explain the low scope readings in (37).[21] While it is possible to formulate such mechanisms (see for instance Manning, Sag, and Iida 1999), I will provide two pieces of evidence below that will show that the VP-complementation approach nevertheless offers a clear advantage here. Before I turn to these, note, however, that by allowing non-compositional modification, the distribution of ad-

[21] Hubert Haider (p.c.) points out that non-structural modification is needed independently since parts of lexical items can be modified by modifiers that are not in a sisterhood relation with those parts. While this is true for certain eventive nominals and certain types of modifiers (e.g., *a beautiful dancer* can refer to a beautiful person who is a dancer or a person who is beautiful as a dancer/who dances beautifully), it is clearly not a general property of modification into lexical items (e.g., *a beautiful dance studio* does not refer to a studio where people dance beautifully). While modification into event nominals raises some interesting questions for the syntax and semantics of these constructions, this phenomenon does not show that modification cannot be not established under a sisterhood relation. Following a distributed morphology style analysis, all that is necessary is to represent the event structure of these nominals syntactically which would then provide the necessary adjunction sites.

verbs could not be taken as evidence for structure anymore (if modifiers do not have to be in a particular structural configuration to yield a particular meaning, the distribution of modifiers becomes irrelevant as a diagnostic for structure). One then has to go back and ask what examples such as (33) tell us about the difference between English and German. That is, why is adverb modification in English taken to be indicative of structure (VP-complementation) but not in German?

The first advantage of the VP-complementation approach is that it not only accounts for the ambiguity in (37) but also predicts when different interpretations should be possible. If the linear order of adverbs with respect to the verbs allows for more than one structural representation (such as in (36)/(37)), ambiguity is predicted. If, on the other hand, the position of the adverb is not structurally ambiguous, only certain readings should survive. One such context where this prediction can be tested is topicalization. As shown in (38)a, if the middle VP in a construction with three verbs is fronted (VP_2 in (36)), adverbs included in the fronted constituent can either modify the lower or the higher one of fronted VP. If, however, only the lowest VP is fronted as in (38)b and the fronted constituent includes an adverb, that adverb can only modify the lowest VP (VP_3 in (36)). Finally, if the adverb is stranded and not included in the fronted constituent as in (38)c, modification of the lower or the middle VP is again possible. Under the structure in (36), this follows straightforwardly if it is assumed that either the adverb is attached to VP_2 and VP_3 is fronted (*often » want*) or the adverb is attached to VP_3 and the lower segment of VP_3 is fronted (*often » win*).

(38) a. *Oft gewinnen wollen wird nur der Leo*
often win want will only the Leo
'Only Leo will often want to win.' [*often* [*win want*]]
'Only Leo will want to win often.' [[*often win*] *want*]

b. *Oft gewinnen wird nur der Leo wollen*
often win will only the Leo want
*'Only Leo will often want to win.' *[*often* [*win want*]]
'Only Leo will want to win often.' [[*often win*] *want*]

c. *Gewinnen wird nur der Leo oft wollen*
win will only the Leo often want
'Only Leo will often want to win.' [*often* [*win want*]]
'Only Leo will want to win often.' [[*often win*] *want*]

The same effect is found with negation (note that in (39)c the reading in which negation takes low scope, i.e., *may » not » go*, is not the preferred reading; however, with stress on negation it is still available for most speakers).

(39) a. *Nicht in die Schule gehen dürfen wird nur der Tim*
Not in the school go may will only the Tim
'Only Tim will not be allowed to go to school.' [*not* [*go may*]]
'Only Tim will be allowed to not go to school.' [[*not go*] *may*]

b. *Nicht in die Schule gehen wird nur der Tim dürfen*
Not in the school go will only the Tim may
*'Only Tim will not be allowed to go to school.' *[*not* [*go may*]]
'Only Tim will be allowed to not go to school.' [[*not go*] *may*]

c. *In die Schule gehen wird nur der Tim nicht dürfen*
In the school go will only the Tim not may
'Only Tim will not be allowed to go to school.' [*not* [*go may*]]
?'Only Tim will be allowed to not go to school.' [[*not go*] *may*]

Comparing (36) to a complex head approach, it is not clear how the distribution in (38)/(39) can be accounted for. If modification does not require sisterhood and is possible of parts of a lexical head, one might expect that all of the above examples should be ambiguous—contrary to fact.

The second advantage of the VP-complementation approach which reinforces the claim that the compositional view on modification is preferable is that it correctly predicts the order of modifiers in cases where more than one modifier is present. Assuming that modifiers attach to the XP they modify, we predict a rigid order of modifiers given a particular interpretation. This is illustrated in (40) (see also next section; examples making the same point in Dutch are given in Bouma 2003; for Japanese see Bobaljik and Wurmbrand 2004, To appear).

(40) a. *weil Thomas oft leise niesen will*
since Thomas often quietly sneeze wants
'since Thomas often wants to sneeze quietly'

b. #/**weil Thomas leise oft niesen will*
since Thomas quietly often sneeze wants
#'since Thomas quietly wants to sneeze often'
*'since Thomas often wants to sneeze quietly'

The ordering of adverbs follows directly from the structure in (34)b; since wanting events are typically not modified by adverbs such as *quietly*, the high attachment of *quietly* yields an odd interpretation. To receive the interpretation where *often* modifies the wanting event and *quietly* modifies the sneezing event, only one structure is possible, hence the order of adverbs is rigid. One might suggest that in the example above the order simply follows from some inherent ordering among adverbs along the lines suggested in Cinque (1999). However, the examples in (41) and the ones I will present in the next section show that this is not sufficient. As shown in (41), the adverb *often* and negation can occur in either order. Importantly, however, the two orders yield different interpretations (I omit the interpretations where both *often* and negation modify the same predicate as these interpretations are irrelevant to the point here): (41)a but not (41)b can refer to a situation in which Leo does not have the desire to win several times—i.e., the scope relation *not » want » often » win*; on the other hand, (41)b but not (41)a can refer to a situation in which Leo often has the desire to not win (e.g., because he wants to let his father win)—i.e., the scope relation *often » want » not » win*.

(41) a. *weil Leo nicht oft gewinnen will*
since Leo not often win wants
'since Leo does not want to win often'
*'since Leo often wants to not win'

b. *weil Leo oft nicht gewinnen will*
since Leo often not win wants
*'since Leo does not want to win often'
'since Leo often wants to not win'

Under the VP-complementation approach, this distribution follows straightforwardly: for *often* to modify the higher predicate in (41)a, it would have to attach to the higher predicate. This, however, would then mean that negation which occurs to the left of the adverb must also be attached to the higher predicate—i.e., negation must take scope over *want* and cannot take embedded scope (which is a possible interpretation of (41)a). Similarly, under the VP-complementation structure there is no way for *often* in (41)b to modify the embedded predicate when negation modifies the higher predicate.

Turning to the complex head approach, whereby modification is non-compositional there is no a priori reason for why adverbs should occur in a particular order. The complex head approach therefore must be enriched with a formal mechanism that explains how modifiers that are attached to the VP headed by the complex head can selectively modify only parts of the complex head, and it must also be supplemented with a system that will produce the correct order of adverbs. Let me stress again that I do not claim that this is impossible. Rather, at the current stage, the advantage of the VP-complementation approach is that these properties simply follow from the structure.

4.5 Type of events[22]

A further argument for a full-fledged VP structure in clause union constructions comes from the event structure properties of these constructions. Events can be classified into telic and atelic events. Following common assumptions (see for instance Rothstein 2004), (a)telicity is not a property of verbs but rather a property of larger units—i.e., VPs. This is illustrated by the distribution of time-span adverbials such as *in/for an hour*. *In* adverbials are used to modify telic events, whereas atelic events are modified by *for* adverbials. Whether an event is telic or atelic depends on the properties of the VP, in particular, the combination of the verb plus the object, and not simply on the verb. If a verb like *build* combines with a definite object as in (42)a, the resulting structure is telic and only an *in* adverbial is possible. If the object is a bare plural, the event is atelic and hence a *for* adverbial is used (see (42)b).

(42) a. *They built the dam in an hour*/**for an hour*
b. *They built dams for an hour.*

The same holds for German as shown in (43).

(43) a. *Sie* *haben* *eine Woche lang* *Dämme* *gebaut*
They have one week long dams built
'They built dams for a week'

b. **Sie* *haben* {*den Damm*} *eine Woche lang* {*den Damm*} *gebaut*
They have {the dam} one week long {the dam} built
*'They built the dam for a week'

c. *Sie* *haben* *den Damm* *in zwei Monaten* *gebaut*
They have the dam in two months built
'They built the dam in two months'

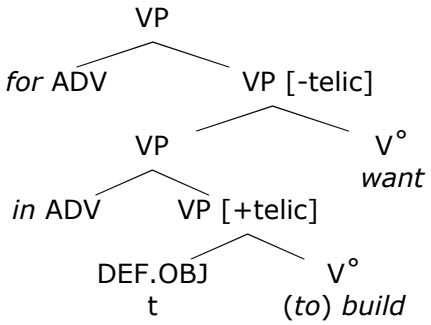
[22] The main argument of this section has also been developed in Bobaljik and Wurmbrand (2004, To appear) for Japanese.

Let us now return to the question of whether clause union constructions involve a complex head structure or VP-complementation. The VP-complementation approach advocated here makes the following prediction. Since there are two (or more) VPs, there are two (or more) distinct event structures which can differ in telicity and, if this is the case, will trigger different time-span adverbials. Furthermore, if there is more than one time-span adverbial the order of these adverbials will again be fixed. The following examples show that these predictions are borne out. First, constructions involving an atelic higher verb such as *want* in (44)a license a *for* adverbial. Under the structure proposed here, (44)c, this adverbial is adjoined to the higher VP since it modifies that VP. Second, if the embedded object is definite as in (44)b, the embedded VP would be telic and hence be modified by an *in* adverbial adjoined to the lower VP. Crucially, the lower VP can only be [+telic] if it contains an appropriate object. The fact that the object has undergone scrambling in this example does not change the telicity of the lower VP, since telicity is determined at the argument structure level (i.e., at a point where the object is inside the lower VP). The presence of an object within the lower VP—exactly as suggested by the VP-complementation approach—thus receives strong support from the telicity properties of these constructions.

(44) a. *Sie haben den Damm [ein Jahr lang [t_{OBJ} bauen wollen]]*
They have the dam [one year long [t_{OBJ} build want]]
'They wanted for a year to build the dam'

b. *Sie haben den Damm [in zwei Monaten [t_{OBJ} bauen]] wollen*
They have the dam [in two months [t_{OBJ} build]] want
'They wanted to build the dam in two months'

c. VP-complementation



Third, as predicted by the structure in (44)c, it is also possible to realize both time-span adverbials simultaneously. An example is given in (45)a. Crucially, however, the order of adverbials is fixed again; switching the *in* and *for* adverbials in this context is impossible (see (45)b). Finally, (45)c shows that two occurrences of the same time-span adverbial are possible when both events have the same telicity value. In (45)c, the lower VP is also atelic since the object is a bare plural, and hence both VPs require a *for* adverbial. While this example is somewhat clumsy and perhaps hard to parse, it is nevertheless clearly grammatical, and importantly, has only one meaning: the first *for*-PP modifies the wanting event, whereas the second PP modifies the building event.

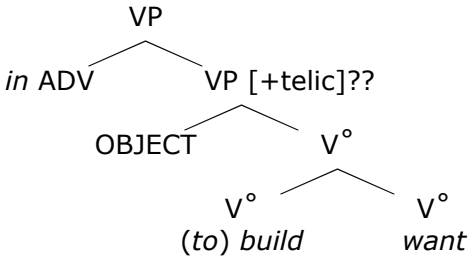
(45) a. *Sie haben den Damm ein Jahr lang in zwei Monaten t_{OBJ} bauen wollen*
They have the dam one year long in two months t_{OBJ} build want
'They wanted for a year to build the dam in two months'

b. **Sie* *haben* *den Damm* *in zwei Monaten* *one Jahr lang* t_{OBJ} *bauen* *wollen*
They have the dam in two months one year long t_{OBJ} build want

c. *Sie* *haben* *ein Jahr lang* *zwei Monate lang* *Dämme* *bauen* *wollen*
They have one year long two months long dams build want
'For a year, they wanted to build dams for two months'

Turning now to the complex head approach, it is far less from clear how these facts can be accommodated. The structure according to the complex head approach is given in (46). The first question this approach is faced with is how it is possible to have more than one modifier of the same type if there is only one single event (recall that complex head approaches are based on the idea that complex head formation yields a unification of the event and argument structures of the predicates involved, hence there should only be a single event). Second, given that the arguments are projected as arguments of the complex head rather than as arguments of the single verbs, properties of the direct object (such as definiteness) should affect the telicity of the whole event, not just parts of the complex head. That is *want to build the dam* should be a telic event, contrary to fact. Lastly, it is again not clear why the order of modifiers is fixed (i.e., how examples such as (45)b would be excluded) if modification is not seen as a structural relation that reflects the scope properties.

(46) Complex head approach



The same questions arise for other event modifiers such as *again, x many times* (see Wurmbrand 2001b for examples). Assuming that modification is separated from scope also means that a structural account of *again* such as the one provided in von Stechow (1996) would not be available under a complex predicate approach.

4.6 Infinitival nominalizations[23]

In this final section, I will discuss the properties of infinitival nominalizations involving verbs that participate in clause union/restructuring constructions. Although the conclusions are still preliminary, these constructions provide some interesting initial further evidence for a VP-complementation structure. As pointed out by a reviewer, verbs participating in clusters can also be part of an infinitival nominalization as in (47).[24]In these constructions, the two verbs appear

[23] I am grateful to an anonymous reviewer for pointing me to these facts.

[24] The reviewer also gives the example *das Mitbenützenversuchen eines Lifts* lit. 'the with-use try a lift.GEN', 'the attempt to jointly use a lift'. However, I do not find examples involving *try* very natural. I have also not found any occurrence of nominalizations (plus genitives) involving *try* via the following Google searches [quotes and wild cards included as indicated]: "das *

as infinitives and the underlying object of the lower verb occurs as a genitive to the right of the nominalized infinitives.

(47) a. *das* *Mitbenützenlassen* *eines Lifts*
the with.use.let a.GEN elevator.GEN
'one's letting [someone] use an elevator'[25]

b. *das* *andauernde* *Erkennenwollen* *eines Vorteils*
the constant detect.want a.GEN advantage.GEN
'the constant wanting to detect an advantage'

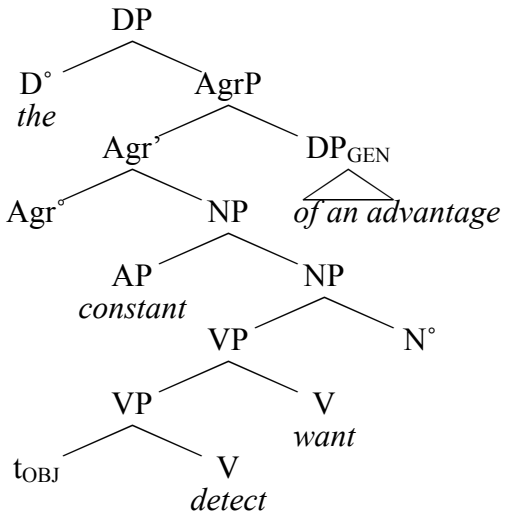
One might conclude that since *erkennen wollen* 'detect want' functions as a noun, these constructions involve a complex head structure (i.e., a V+V+N head). However, in what follows I will provide evidence for the need of a more elaborate structure—essentially a VP-complementation structure—for these nominalizations.

Let me start with my analysis for these nominalizations. As shown in (48), I assume that the head N (which hosts the overt or abstract nominalizing suffix) combines with a full VP complement headed by the verb *want*, which in turn, combines with another full VP complement containing the object *the advantage* and the head *detect*. Crucially, although these are full VPs they lack Case projections, exactly as suggested for the restructuring configuration in (4)b. Since the object can therefore not be assigned Case within the VPs, it becomes Case-dependent on the functional domain of the higher predicate—i.e., it becomes Case-dependent on the nominal predicate. The Case that is assigned to arguments within a noun phrase in German is genitive Case, and crucially, this Case is always assigned to the right (see Giorgi and Longobardi 1991). I have represented this in (48) simply via a right-hand specifier. However, a left-hand specifier analysis is possible as well, if one accepts various (remnant) movement operations. Lastly, as the whole construction is an NP, adjectival modification (i.e., adjectives modifying the NP) is, of course, possible. [It is irrelevant for the purpose of this paper whether adjectives are adjoined to NP as in (48) or whether they are assumed to occupy specifiers of additional functional projections à la Cinque 1999.]

versuchen eines", "das * versuchen einer", "das zu * versuchen eines", "das zu * versuchen einer", "das * zu * versuchen einer". I will therefore concentrate on the constructions in (47) which are attested abundantly. Although I will present a structural analysis of these nominalizations below, it should be pointed out that their productivity is not very high (essentially, these nominalization only work well with *want* and *let*).

[25] German allows the embedded subject to be dropped in *let* constructions (e.g., *Ich ließ den Lift mitbenützen* lit. 'I let the elevator use', with the meaning 'I let someone use the elevator'). I represent these dropped arguments within square brackets in the translations.

(48) Infinitival nominalizations (restructuring)



The claim that there is movement of NP-internal arguments to the right as in (48) has been argued for in detail in Giorgi and Longobardi (1991). As shown in (49), NP-internal genitive subjects (i.e., arguments referring to agents) also occur in the post-nominal position in German (cf. (49)a), and, in most cases, cannot occur pre-nominally (cf. (49)b).[26] Assuming that NP-internal subjects are base-generated in the specifier of the NP (i.e., to the left of the head noun), cases such as (49)a hence provide evidence for movement to the right (or, again, movement to some higher left specifier, followed by various remnant movements). Since rightward movement of NP-internal arguments is required independently in German, movement of the VP-internal object to the right as in (48) does not seem to be a problematic assumption.

(49) a. *die* *Ausstellung* *des Freundes* *meiner Mutter*
the exhibiton the.GEN friend.GEN my.GEN mother
'the exhibition of my mothers' friend'

b. *[(*die*) *des Freundes* *meiner Mutter* *Ausstellung*]
the the.GEN friend.GEN my.GEN mother exhibition
'the exhibition of my mothers' friend'

Let us then turn to the arguments for VP-structures in these nominalizations. First, the structure in (48) correctly predicts that these infinitival nominalizations can include VP-adverbs and other VP-internal elements. As shown in (50) (examples a-c are from Google and considered perfectly grammatical by the author), adverbs such as *temporarily, backwards, slowly* are possible in these nominalizations (note that in German, the morphology clearly distinguishes between adjectives and adverbs in these contexts). Since in the example in (50)c, it is not clear whether the genitive is the embedded object of *die away* or the subject/possessor of the NP, I have included example (50)d where the genitive clearly refers to the embedded object, and I find this construction entirely grammatical as well.

[26] Examples with post-nominal genitives are hence ambiguous in German. While the agent (i.e., subject) interpretation of *my mother's friend* is favored pragmatically in (49)a, a theme (i.e., object) interpretation is possible as well.

(50) a. *das zeitweilig brach liegen lassen eines gesamten Feldes*
the temporarily idle lie let a.GEN whole field.GEN
'one's letting a whole field lie idle temporarily'

b. *das rückwärts laufen lassen eines Videos*
the backwards run let a.GEN video.GEN
'one's letting a video run backwards'

c. *das langsam ausklingen lassen eines Kommentators*
the slowly out.fade let a.GEN commentator.GEN
'a commentator's letting [something] fade out slowly'
'one's letting [someone] fade out a commentator slowly'

d. *das langsam ausklingen lassen eines schönen Abends*
the slowly out.fade let a.GEN nice evening
'one's letting a nice evening fade out slowly'

The presence of adverbs is expected under a structure such as (48) and it is not as obvious how these examples would be represented under a V+V+N analysis.

The second argument for the structure in (48) comes from negation, in particular, VP-negation. As is shown in (51) (all examples are again from Google), infinitival nominalizations can involve the negative element *nicht*.

(51) a. *das nicht wahrhaben wollen eines Verlustes*
the not true.have want a.GEN loss
'one's not wanting to accept a loss'

b. *das nicht einsehen wollen eines unbeschreiblichen Blutbades*
the not accept want a.GEN indescribable massacre
'one's not wanting to accept an indescribable massacre

c. *das nicht benutzen wollen eines Kondoms*
the not use want a.GEN condom.GEN
'one's not wanting to use a condom'

Importantly, *nicht* negation cannot occur in true V+N nominalizations such as (52)a,b,c (i.e., in nominalizations where the nominal suffix attaches directly to the root). In contrast, negation is possible again in the corresponding infinitival nominalizations in (52)a',b',c'.[27]

(52) a. **die Nicht-Zerstörung* a'. *das Nicht-Zerstören*
the not-destruction the not-destroy.INF

b. **sein Nicht*-Anruf b'. *sein Nicht-Anrufen*
his not-call.N his not-call.INF

c. **seine Nicht-Zusage* c'. *sein Nicht-Zusagen*
his not-acceptance his not-accept.INF

[27] Note that agentive *–er* deritivations such as *Raucher* 'smoker' allow *nicht* modification (e.g., *Nichtraucher* 'non-smoker', *Nichtschwimmer* 'somebody who does not swim'). However, this is not surprising since the structure of these nominalizations has been argued to involve a more complex structure (see in particular Marantz 2001 who argues that agentive *-er* attaches to *v*P).

The same phenomenon can be found with adverbs. Root nominalizations as in (53)a do not allow adverbial modification, whereas infinitival nominalizations allow adverbs (cf. (53)b).

(53) a. **seine* *oftmalige* *falsch* *Vorhersage*
his numerous wrongly forecast

b. *sein* *oftmaliges* *falsch* *Vorhersagen* *des Wetters*
his numerous wrongly predict.INF the.GEN weather.GEN

The examples in (51) together with the contrasts in (52) und (53) thus provide further evidence for a more complex structure of infinitival nominalizations. Since *nicht* negation and adverbs can attach to VPs, a VP-structure as in (48) is supported. Under a complex head analysis, on the other hand, it would not be clear how negation and adverbs are licensed in infinitival nominalizations in contrast to root nominalizations.

Lastly, the account suggested here, which involves crucial reference to restructuring, predicts that we should find a restructuring/non-restructuring difference in nominalizations as we do in verbal constructions. Restructuring in these nominalizations has been argued to be detectable by the Case-dependency of the underlying embedded object on the nominal Case domain (due to the lack of a Case domain in the embedded VP). In the verbal domain, restructuring often alternates with non-restructuring in that the infinitive can also project its own functional domain, in which case Case is then assigned within the infinitive (see the examples in (18)). The same phenomenon seems to exist in infinitival nominalizations (see (54)).

(54) a. *sein* *den Lift* *Mitbenützenlassen*
his the.ACC elevator with.use.let
'his letting [someone] use the lift'

b. *das* *andauernde* *einen Vorteil* *Erkennenwollen*
the constant a.ACC advantage detect.want
'the constant wanting to detect an advantage'

The structure I suggest for these examples would be similar to the one in (48), with the crucial difference that the higher verb (*want*) combines with a *v*P instead of a VP. Since there is a Case projection within the lowest infinitive, the embedded object then ends up with accusative and does not undergo movement to the nominal Case domain.

Furthermore, in the verbal domain, not all infinitival constructions allow restructuring properties such as long passive. In particular, infinitives combining with predicates such as *bedauern* 'regret', *planen* 'plan' prohibit these properties. As shown in (55) and (56), the same is the case in infinitival nominalizations (however, as pointed out in fn. 24 infinitival nominalizations are rather restricted, and therefore this fact might not be that surprising). While *planen* 'plan' and *bedauern* 'regret' can occur as nominalized infinitives, their complements have to be at least *v*Ps, if not full clausal complements. This can be seen in (55)a,b and (56)a,b where the embedded objects occur with accusative Case. The examples in (55)b and (56)b are slightly marked since these center-embeddings are often harder to process and typically speakers prefer extraposition. However, I think they are nevertheless grammatical. Crucially, however, (55)c and (56)c where the embedded object occurs as a genitive in the nominal domain are entirely impossible. this shows that no VP structure (i.e., restructuring) is possible in these constructions.

(55) a. *ihr* *frühzeitiges* *Planen* [*einen reichen Mann* *zu heiraten*]
her early plan.INF a.ACC rich man to marry
'her early planning to marry a rich man'

b. ?*ihr* *frühzeitiges* [*einen reichen Mann* *zu heiraten*] *Planen*
her early a.ACC rich man to marry plan.INF

b. **ihr* *frühzeitiges* *zu heiraten* *Planen* *eines reichen Mannes*
her early to marry plan.INF a.GEN rich man.GEN

(56) a. *sein* *ständiges* *Bedauern* [*einen Fehler* *gemacht* *zu haben*]
his constant regret.INF a.ACC mistake made to have
'his constant regretting having made a mistake'

b. ?*sein* *ständiges* [*einen Fehler* *gemacht* *zu haben*] *Bedauern*
his constant a.ACC mistake made to have regret.INF

c. **sein* *ständiges* *gemacht* *zu haben* *Bedauern* *eines Fehlers*
his constant made to have regret.ING a.GEN mistake.GEN

To conclude, although I have only presented a preliminary analysis of infinitival nominalizations, we have seen that these constructions show interesting properties regarding adverbial modification and negation, which point again to the presence of a VP-structure in clause union/restructuring constructions.

5. CONCLUSION

In this paper I have argued that clause union/restructuring constructions such as verb clusters in German do not involve actual head clustering in the form of complex head formation. Several arguments were provided showing that clause union properties are licensed in the absence of complex head formation from which it was concluded that complex head formation cannot be seen as a necessary or sufficient condition on clause union/restructuring. I have compared complex head approaches to syntactic complementation approaches, in particular an approach where the verbs of a restructuring construction project independent VPs which include all the internal arguments associated with the particular verbs. VP-complementation was shown to make the right predictions regarding constituency and word order tests, as well as modification, event structure properties, and infinitival nominalizations. For all these properties, complex head approaches could provide adjustments, however, the main advantage of the VP-complementation approach advocated here is that no additional assumptions are necessary but all the properties discussed simply follow from the structure suggested.

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Susi Wurmbrand
University of Connecticut
Department of Linguistics, Unit 1145
337 Mansfield Road
Storrs, CT 06269-1145
E-mail: susi@alum.mit.edu