

HOW COMPLEX ARE COMPLEX PREDICATES?

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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 arguments associated with the particular verbs. A series of empirical facts are considered (constituency, word order, modification, and event structure properties) 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 these 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.

Keywords: complex predicates, extraposition, event structure, restructuring, verb clusters, VP-structure.

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 as 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 amount 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 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 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 either 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 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, to appear-a, Meurers 2000 among many others for HPSG, or Geach 1970, Steedman 1985 for Categorical grammar, Williams 2003 for Representation Theory). Since the focus of this paper is a comparison of complex head approaches with XP-complementation approaches, I will mostly concentrate on frameworks where the distinction between a head and an XP is a meaningful grammatical notion. If this distinction is not made in a particular framework—i.e., if the difference between a compound-like complex head and an XP-complement is not represented structurally—the question under consideration here (namely whether multiple verb constructions in German involve a V-V cluster or VP-complementation) becomes meaningless. Thus, while I believe that the arguments I will offer raise important questions for any kind of complex head approach, the weight of these arguments will differ depending on what the status of phrase structure and structure dependence is in any given framework.

2. COMPLEX HEAD VS. XP-COMPLEMENTATION

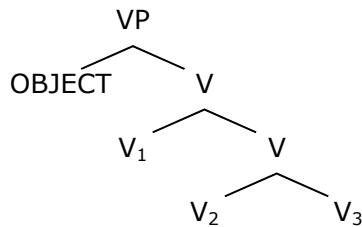
Let us begin by looking in more detail at the two types of approaches to clause union/verb clustering to be compared in this paper. As is well-known, clause union or restructuring constructions are characterized by the fact that these constructions constitute a single monoclausal domain as diagnosed by a range of phenomena that are typically clause-bound (such as certain movement operations, Case assignment, or scope).¹ One type of account for the monoclausal behavior is thus to assume that clause union constructions do not involve a bi-clausal

¹ 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.

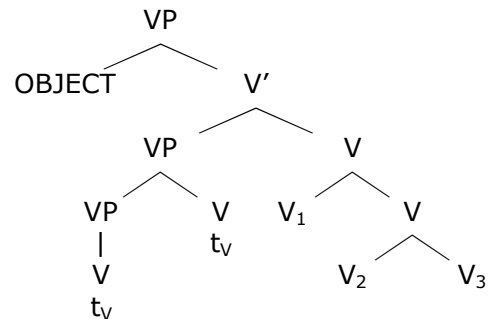
structure but are single clauses throughout the derivation.² Among the mono-clausal approaches, however, there are two basic types of approaches which are at the core of this paper.

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 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’

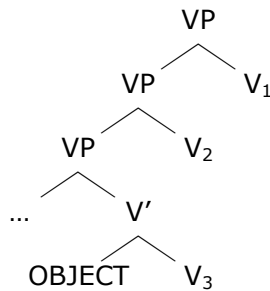
² Since the purpose of this paper is a comparison of complex head approaches with VP-complementation approaches, I will not discuss bi-clausal approaches to clause union here. See Haider (1991, 1993) and Wurmbrand (2001b) for arguments in favor of mono-clausal approaches.

- 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’

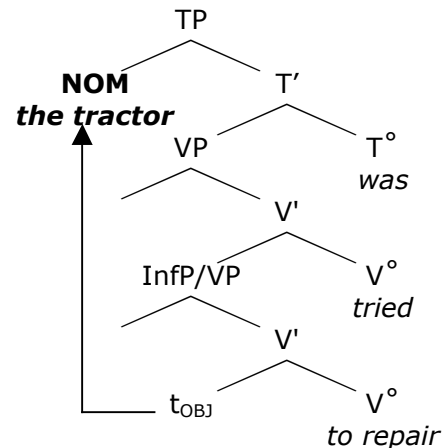
Under the complex head approach, this case conversion is explained as follows: the verbs *to repair* and the passive *was tried* combine their argument structures and assign Case to the arguments compositionally. Since the resulting complex head *was tried + to repair* is passive (the head of the V-V 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).³ 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. 3). 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., *vP*, *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 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



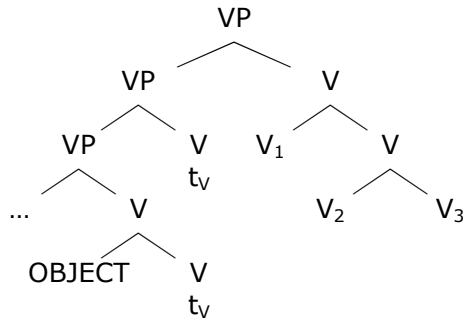
b. Long passive



³ For this paper, I will treat multiple verb constructions as stacked VPs. However, this is merely for convenience. In Wurmbrand (2001b, 2004c) I argue that certain ‘verbs’ in these constructions do not head lexical VPs but are rather projected as heads of functional clausal projections. The arguments presented here will not be affected by this labeling choice.

Finally, there is in principle 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 achieve certain clause union properties (such as the clustering effect).

(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 by certain elements (see (6)a), (certain) verb clusters in German or Dutch are impenetrable (see (6)b).

- (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 ... V [VP ... V [VP ... V [VP ... V ...]]]]
 b. [VP ... [V° ... [V° ... [V° V° V°] V°] V°]]

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.⁴

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 can target neither a position between two verbs of a clause final cluster ((8)a) nor 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*] [*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, 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'

⁴ Note that if this assumption is not made (see for instance Müller, to appear-a), 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.

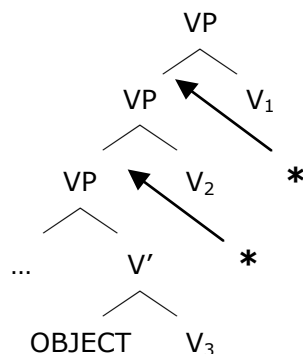
Haider (2003) (and previous works) therefore concludes that the prohibition against extraposition between clause final verbs only follows if the verbs form a base-generated cluster (if the cluster was derived, (8)b should be possible): "...the 'no-intervener' property is clear counterevidence to any 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.⁵

3.2 Picking up the challenge

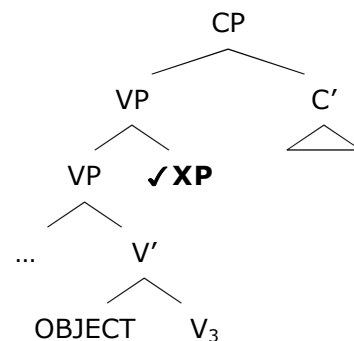
To begin with, let us note that adjacency per se does not entail complex head formation. While a base-generated complex head analysis might entail adjacency (under the assumption that intervening material can only attach to XPs), an adjacency requirement does not entail a complex head analysis. One of 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 [_{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



⁵ 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).

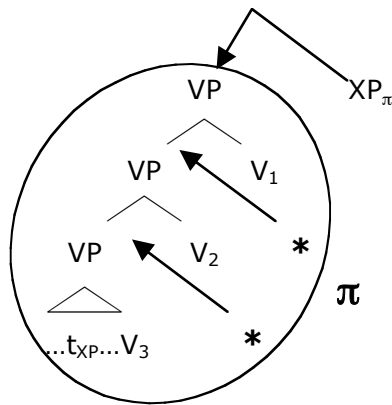
- (11) Let XP be a syntactic category that is canonically mapped into the prosodic category π upon extraposition (where π is either the phonological phrase or the intonational phrase in the following). The extraposition from NP will take XP as far as out of a prosodic constituent of the same category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

$$(\dots XP \dots)_\pi \rightsquigarrow (\dots t_i \dots)_\pi (XP)_\pi \quad [\text{Truckenbrodt 1995: 503}]$$

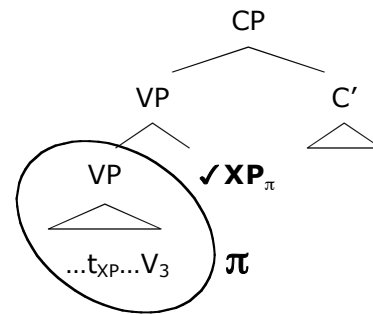
According to (11), an extraposed phrase of a particular prosodic category has to be placed immediately outside of the phrase (of the same prosodic category) where it originates in. The constraint is violated if movement is either too short (i.e., if the extraposed phrase does not leave the prosodic phrase it originates in) or too long (i.e., if the extraposed phrase moves out of more than one prosodic phrases 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 Nespore and Vogel (1989), Truckenbrodt assumes that phrasal stress provides direct evidence for the number of phonological constituents. In particular, Nespore and Vogel (1989)’s 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). 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 |
| [| x | x |] | |
| (daß der Peter) _∅ | (oft Rezensionen gelesen haben soll) _∅ | | | findet Paul komisch |
| 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) _∅ | | | (von Anaïs Nin _i) _∅ |
| | 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) _∅ | (hat er oft) _∅ | | |
| H^P | | | |
| books read | has he often | | |
| 'He often read books' | | | |
- d.
- | | | | |
|---|----------------------------------|--|---|
| x | | | x |
| (Bücher gelesen) _∅ | (soll er oft haben) _∅ | | |
| 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

extraposition 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's 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).⁶ 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.⁷

⁶ Following Truckenbrodt (1995), the indirect object in (16)a 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.

⁷ The current analysis therefore predicts that there could be syntactic or semantic effects of extraposition in cases where the

- (16) a. [[*those* [*who...*]_{REL} *something given*]_{VP} *has*]_{VP} [*who...*]_{REL}]_{VP} Syntax
 (*those*)_∅ ~~*who...*~~ (*something given* *has*)_∅ (*who...*)_∅ PF
- b. [[*those* [*who...*]_{REL} *something given*]_{VP} [*who...*]_{REL}]_{VP} *has*]_{VP} Syntax
 **(those)*_∅ ~~*who...*~~ (*something given*)_∅ (*who...*)_∅ (*has*)_∅ PF
- c. [[*those* [*who...*]_{REL} *something given*]_{VP} [*who...*]_{REL}]_{VP} *has*]_{VP} Syntax
 (*those*)_∅ (*who...*)_∅ (*something given* ~~*who...*~~ *has*)_∅ 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*)_∅ (~~*who...*~~)_∅ (*something given*)_∅ (*who...*)_∅ (*has he never*)_∅ 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., *vP*, *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.’

“extraposed” 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.⁸

- (19) a. *weil* || *den Wagen zu reparieren* || [_{Rel.cl} *der schon seit Tagen*
 since || the.ACC car to repair || [_{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 prosodic factors such as (14), the PF accounts nevertheless clearly show that adjacency does not require us to assume a complex head structure. The facts can be explained under a VP-complementation structure for verb clusters, hence eliminating the argument against VP-complementation. 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.

⁸ 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.

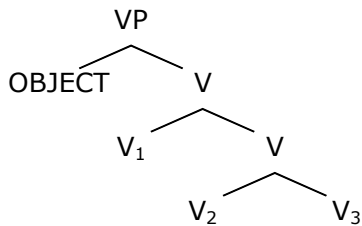
4. EVIDENCE FOR VP-COMPLEMENTATION

In this section, I will provide a number of arguments that point to a VP-complementation analysis over a complex head analysis. The evidence will involve 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, and modification and event structure properties which will point to the presence of lower VPs. As mentioned in the introduction, certain of these arguments will be theory-internal, and hence some conclusions might not hold across frameworks which do not share the underlying assumptions. Nevertheless, I believe that the VP-complementation approach is more advantageous in that it does not only allow us to correctly derive the properties of the sum of the constructions to be discussed but it also allows us to do this in a very straightforward way without having to invoke additional assumptions. In other words, even if descriptive adequacy can be achieved for the sum of these properties under a complex head approach, the VP-complementation still has the advantage of explanatory adequacy—all the properties to be discussed are predicted to be the way they are if one assumes VP-complementation, whereas they, although perhaps derivable, are not expected under the complex head approach.

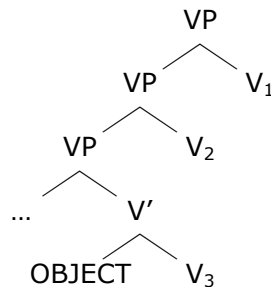
4.1 Lack of adjacency and excorporation

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 X⁰s) 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 syntactic 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.⁹ 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 the 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.

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.¹⁰ Under these assumptions (see below for a different direction), the fronted strings in (21)a and (22) must be XPs. Since, under the complex head

⁹ 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.

¹⁰ The latter claim has sometimes been challenged (see for instance S. Müller 1999, 2003). However, the examples presented there can be reanalyzed as remnant VP structures (see G. Müller 1998, Fanselow 2002, S. Müller, to appear-b) or small clause structures (Haider 1982, Wunderlich 1984), and hence they do not challenge the claim that the preverbal material in a V2 clause constitutes one single constituent.

approach, however, the lower verb starts out as part of a complex lexical 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 ((22), (13)d), since in these cases, the finite verbs occur in C, the middle verbs (V₂ in (20)a) in clause-final position, and the lowest verbs in topicalized position.¹¹

Assuming that the fronted string constitutes one single XP in (22), the only option under the complex head approach is to assume that the whole VP is fronted, with the finite verb and the middle verb having excorporated first. This is illustrated in (23).

- (23) a. [[*Erklären* t_{MOD}]V°]VP *müßte man das* [t_{VP} *können*] ?P
 [[*Explain* t_{MOD}]V°]VP *must one that* [t_{VP} *can*] ?P
- b. [*Einen Millionär* [*einladen* t_{MODAL} t_{AUX}]V°]VP *hätte man* [t_{VP} *sollen*] ?P
 [A.ACC millionaire [*invite* t_{MODAL} t_{AUX}]V°]VP *had one* *should* ?P

These structures, however, raise three questions. First, as argued in Haider (1990, 1993, to appear) 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).

- (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.

¹¹ 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, given that Spec,CP can only host XPs and not heads. Furthermore, without assuming multiple excorporation 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.

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 the derivations in (23) raise has to do with the adjacency requirement again. Assuming movements 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.¹² 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 Wurmbrand, to appear, 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.

¹² One could, of course, postulate that these movements only occur when topicalization takes place. The obvious question, however, then is how to motivate and restrict these syntactic movement operations.

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 seem 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.¹³

Let me stress again that this conclusion only holds if one accepts the standard characterization of topicalization and V2 movement. If these assumptions are not shared, examples such as (21) or (22) could presumably be derived under a complex head approach. S. Müller, to appear-a, who adopts the HSPG framework, for instance, claims that fronting is not restricted to XPs but that lexical heads are also allowed in initial position. According to this view, then, examples such as (22)a are not problematic for (this version of) the complex head approach. While this could take care of (22)a, something else still needs to be said about (21)a and (22)b (e.g., either that fronting does not have to apply to constituents or that remnant movement is possible, ignoring the headless fronting constraint). More importantly, however, the view that fronting of heads or parts of lexical items is possible is faced with the problem of massive over-generation and the loss of any predictive power. How do we know which parts of a lexical head can be separated? For instance, why can parts of a complex verb be fronted as allegedly in (22)a, but the parts of a compound as in (27) cannot be split up?

- (27) a. *Milchschokolade* *mag* *er* *nicht* t_{NP}
 mil.chocolate likes he not t_{NP}
 ‘Milk chocolate, he doesn’t like.’
- b. **Milch* *mag* *er* *nicht* [t_N *Schokolade*]_{N°}
 milk likes he not [t_{NP} chocolate]_{N°}
- c. **Schokolade* *mag* *er* *nicht* [*Milch* t_N]_{N°}
Chocolate likes he not [milk t_{NP}]_{N°}

While one can imagine working out elaborate systems which ultimately might allow one to distinguish between movable parts of complex heads and unmovable parts of complex heads, it seems fair to conclude at this point that these systems will require an enrichment of the lexical entries and other additional assumptions which presumably will mirror exactly the structure which comes for free in the VP-complementation approach.

¹³ Another option one might suggest for dealing with examples such as (22) would be to assume that cluster formation is always optional in multiple verb constructions. That is, verbs can cluster as complex heads but can also project as independent VPs. If they project as non-clustering VPs, fronting as in (22) is possible (see S. Müller 2002 for such an account). While the optionality of clustering/restructuring is well justified for lexical restructuring constructions such as (18), it is highly questionable for modal/auxiliary constructions. First, the major argument for complex head formation disappears. If clustering is optional, an account of the adjacency facts could not be based on the idea that lexical compounds are impenetrable, but would require an account similar to the one offered above for the VP-complementation approach. Second, if complex head formation is optional it cannot be seen as the licensing trigger for clause union properties (see also next section for the same conclusion). Hence, clause union effects require a different explanation (again, such as the one offered by the VP-complementation approach). If complex predicate formation is neither required nor necessary, however, the question is why one would posit complex predicate formation at all for these constructions. Since this mixed approach requires the same assumptions as the VP-complementation approach it seems that positing an additional structure (optional complex head formation) is superfluous.

4.2 Lack of cluster formation and clause union properties

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 cluster formation is not required to license these properties. Thus, the conclusion will be that complex head formation cannot be seen as a condition for 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. 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.¹⁴ 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>

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

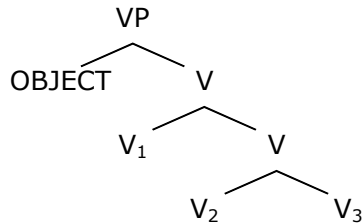
We can thus conclude that adjacency or overt clustering is not a requirement for clause union which poses a clear problem for accounts which are based on the idea that overt cluster formation is a necessary condition for clause union.

Let us then see how complex head analyses could be reconciled to capture these facts. Under a base-generated or derived complex head approach (see (2), repeated here as (29)), the same questions arise as pointed out in the previous section. That is, one is forced to 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.¹⁵

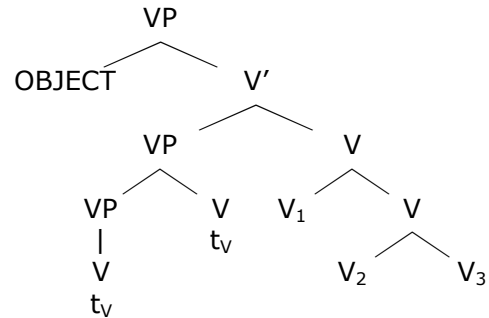
¹⁴ Note that many German speakers (including myself) find long passive in extraposition contexts not fully grammatical. However, in a Google search of the string *versucht wurden* 'tried were.PL' (June 2003) 26 cases of long passive and extraposition were found (the results of the search are available 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.

¹⁵ The questions would be slightly different for the derived complex head approach if complex head formation is derived covertly (see below). However, excorporation would still be necessary to account for cases where movement applies to an

(29) a. Base-generated complex head



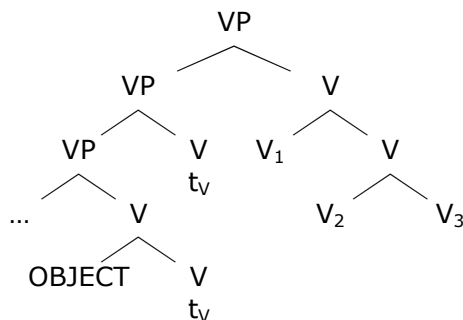
b. Derived complex head



The first option would essentially have the effect of re-creating the VP-complementation structure I am arguing for here. The question a proponent of the complex head plus excorporation approach would hence be faced with is how to motivate this clearly more powerful system. Since under the VP-complementation approach clause union properties are accounted for without requiring any complex head formation and the facts in (28) follow straightforwardly from the structure proposed, the VP-complementation approach seems to be preferable here, at least in terms of simplicity. If one pursues the second option (movement does not apply to constituents), one would again be faced with the question of how to characterize what strings of elements can be moved to or generated in topicalized/extrapolated position. While there are some questions about topicalization of apparently discontinuous phrases, several authors (see fn. 10) have shown that these cases can be accounted for assuming a more refined structure of the topicalized unit, and hence no conclusive evidence that fronting can apply to non-constituents has been provided. Rather, the overwhelming evidence is that clear cases of non-constituents cannot occur in fronted position. Thus, giving up the idea that the strings in the fronted or the extrapolated positions in the examples above are non-constituents would lead to a system that might fail in explaining the basic facts of fronting and extraposition, or, at the very least, a system without any predictive power.

Finally, let us consider the mixed VP-complementation and complex head approach illustrated in (5), repeated as (30).

(30) VP-complementation & incorporation



argument plus the lowest verbs (such as (26)).

If incorporation takes place in overt syntax, the same problems arise as for the other two complex head approaches. However, one might suggest that incorporation takes place covertly. This would have the advantage that there is a VP constituent including the lowest verb's arguments. Hence examples such as (26) or (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 (30) 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, to appear, 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 (30) but that, at least in certain constructions, the lower copy of the moved verb can be pronounced. However, since clause union properties can also be accounted for without this incorporation process, we can conclude again that while nothing seems to exclude 'covert' incorporation as outlined above, nothing seems to require it either.

In sum, constituency and word order facts strongly point to the conclusion that in clausal union/restructuring constructions, the lowest verb is the head of an independent VP which includes the arguments of that verb. Furthermore, adjacency/clustering is not a requirement for clause union. Therefore, accounts that are based on the claim that complex head formation is a necessary condition for clause union fail to account for clause union constructions involving topicalization or extraposition.

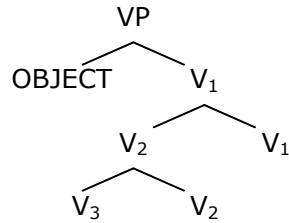
4.3 Adverbial modification

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 position where adverbs and other modifiers can be placed (see (6), repeated here as (31)).

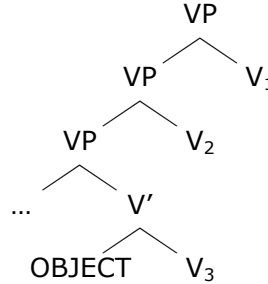
- (31) a. *The new theory certainly may possibly have indeed been badly formulated.*
 [Haider 2003 citing Quirk et al. 1986]
- b. *daß die Theorie [...] schlecht formuliert (*) worden (*) sein (*) mag*
 that the theory badly formulated been be may
 'that the theory may have been badly formulated'

If German is assumed to have the structure in (32), 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.

(32) a. Complex head approach



b. VP-complementation approach (OV)



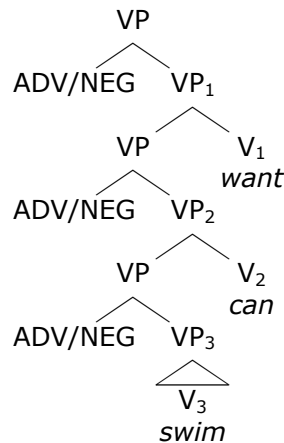
In section 3.2, I have offered an account of the prohibition against extraposition to intermediate VPs. Note, however, that under both approaches in (32) it is necessary to exclude right adjunction of adverbs in German, since, as shown in (33), clause-final adverbs are impossible in German. A general prohibition against right-adjunction of adverbs in German, however, then also accounts for (31) without further assumptions.

(33) **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 (32), there is one important difference in addition to the position of the object: in (32)a, there is only one VP which can function as an adjunction site, whereas there are multiple attachment positions in (32)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 (32)b. Assuming that syntactic structure corresponds to the interpretation, it is predicted that adverbs preceding multiple verbs in a mono-clausal configuration will modify different parts of the verbal complex, depending on where exactly they are attached (see (34)).

(34) Adverb attachment sites in VP-complementation structure



This is shown to be correct in the examples in (35). 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.

- (35) 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 (35) 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 (35).¹⁶ 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 will turn to these, note, however, that by allowing non-compositional modification, the distribution of adverbs 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 (31) 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 (35) 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 (34)/(35)), 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 (36)a, if the middle VP in a construction with three verbs is fronted (VP₂ in (34)), 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 (36)b and the fronted constituent includes an adverb, that adverb can only modify the lowest VP (VP₃ in (34)). Finally, if the adverb is stranded and not included in the fronted constituent as

¹⁶ 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.

in (36)c, modification of the lower or the middle VP is again possible. Under the structure in (34), this follows straightforwardly if it is assumed that either the adverb is attached to VP₂ and VP₃ is fronted (*oft* » *want*) or the adverb is attached to VP₃ and the lower segment of VP₃ is fronted (*oft* » *win*).

- (36) 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 often win.’ [[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 often win.’ [[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 often win.’ [[often win] want]

The same effect is found with negation (note that in (37)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).

- (37) 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 (34) to the complex head approach, it is not clear how the distribution in (36)/(37) 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 will enforce 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 that a rigid order of modifiers given a particular interpretation.

This is illustrated in (38) (see also next section; examples making the same point in Dutch are given in Bouma 2003).

- (38) 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 (32)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 (39) and the ones I will present in the next section show that this is not sufficient. As shown in (39), 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): (39)a but not (39)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, (39)b but not (39)a can refer to a situation in which Leo often has the desire to not win (e.g., because he wants to let his little son win)—i.e., the scope relation *often* » *want* » *not* » *win*.

- (39) 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 (39)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 (39)a). Similarly, under the VP-complementation structure there is no way for *often* in (39)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 reason for why adverbs should occur in a particular order. The complex head approach therefore not only must be enriched with a 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, it must also be supplemented with a system that will produce the correct order of adverbs. In sum, while under the VP-complementation approach, the scope properties simply follow from the structure, an explicit theory of adverbial modification is necessary in the complex head approach to account for and predict the distribution of adverbial scope.

4.4 Type of events¹⁷

The final 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 (40)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 (40)b).

- (40) 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 (41).

- (41) a. *Sie haben 1 Woche lang Dämme gebaut*
 They have 1 week long dams built
 ‘They built dams for a week’
- b. **Sie haben {den Damm} 1 Woche lang {den Damm} gebaut*
 They have {the dam} 1 week long {the dam} built
 *‘They built the dam for a week’
- c. *Sie haben den Damm in 2 Monaten gebaut*
 They have the dam in 2 months built
 ‘They built the dam in two months’

Let us now return to the issue of this paper, 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* license a *for* adverbial (cf. (42)a). Under the structure proposed here (see (42)c), this adverbial is adjoined to the higher VP since it modifies that VP. Second, if the embedded object is definite, the

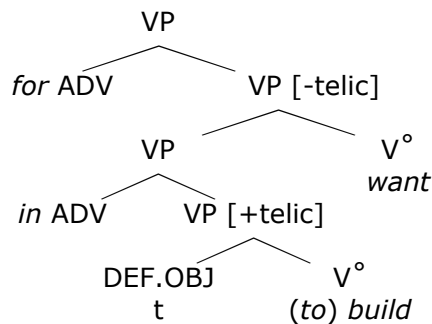
¹⁷ The main argument of this section has also been developed in Bobaljik and Wurmbrand (2004) for Japanese.

embedded VP would be telic and hence be modified by an *in* adverbial which is adjoined to the lower VP. Note that 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).

(42) a. *Sie haben den Damm [1 Jahr lang [t_{OBJ} bauen wollen]]*
 They have the dam [1 year long [t_{OBJ} build want]]
 ‘They wanted for a year to build the dam’

b. *Sie haben den Damm [in 2 Monaten [t_{OBJ} bauen]] wollen*
 They have the dam [in 2 months [t_{OBJ} build]] want
 ‘They wanted to build the dam in two months’

c. VP-complementation



Third, as predicted by the structure in (42)c, it is also possible to realize both time-span adverbials simultaneously. An example is given in (43)a. Crucially, however, the order of adverbials is fixed again; switching the *in* and *for* adverbials in this context is impossible (see (43)b). Finally, (43)c shows that two occurrences of the same time-span adverbial are possible when both events have the same telicity value. In (43)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.

(43) a. *Sie haben den Damm 1 Jahr lang in 2 Monaten t_{OBJ} bauen wollen*
 They have the dam 1 year long in 2 months t_{OBJ} build want
 ‘They wanted for a year to build the dam in two months’

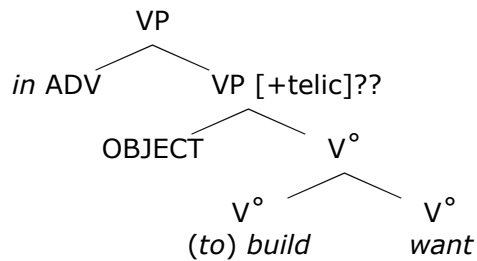
b. **Sie haben den Damm in 2 Monaten 1 Jahr lang t_{OBJ} bauen wollen*
 They have the dam in 2 months 1 year long t_{OBJ} build want

c. *Sie haben 1 Jahr lang 2 Monate lang Dämme bauen wollen*
 They have 1 year long 2 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 (44). 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* 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 (43)b would be excluded) if modification is not seen as a structural relation that reflects the scope properties.

(44) 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.

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 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 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, and event structure properties. 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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