Particle verbs and the conditions of projection

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1. Introduction

In this paper I discuss the properties of particle verbs in light of a proposal about *syntactic projection*. In section 2 I suggest that projection involves functional structure in two important ways: (i) only functional phrases can be complements, and (ii) lexical heads that take complements and project must be inflected. In section 3, I show that the structure of particle verbs is not uniform with respect to (i) and (ii). On the one hand, a particle always combines with an inflected verb; in this respect, particle verbs look like verb-complement constructions. On the other hand, the particle is not a functional phrase and therefore is not a proper complement, which makes the combination of the particle and the verb look more like a morphologically complex verb. I argue that syntactic rules can in fact interpret the node dominating the particle and the verb as a projection *and* as a complex head. In section 4, I show that many of the characteristic properties of particle verbs in the Germanic languages follow from the fact that they are structural hybrids.

2. Functional structure and projection

Consider the difference between the bracketed constituents in (1):

(1) a. John [*drives trucks*] = XP
b. John is a [*truck-driver*] = X^0

If the finite verb *drives* combines with the noun *trucks*, the verb projects, and the result is a syntactic phrase (a VP). In contrast, if the noun *driver* combines with the noun *truck*, neither of the two projects,

and the resulting structure is a complex noun. The question that needs to be addressed is why projection only takes place in the example in (1a).

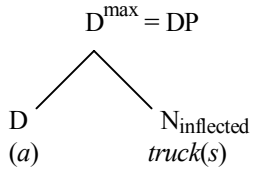
The standard answer to this question is simple. (1a) is a head-complement construction. Complements must be phrases, i.e. XPs (cf. Stowell 1981); the noun *trucks* in (1a) hence stands for a whole noun phrase, and if this NP combines with a verbal head, the verb projects. In contrast, (1b) is a compound, and non-heads of compounds are normally not analyzed as phrases.[1] Therefore, *truck* in (1b) is a bare noun, and if it merges with *driver*, no projection takes place.[2]

However, the claim that the noun in (1a) is a phrase raises a question. Phrases are maximal projections, but it is not immediately obvious why *trucks* should be analyzed as a projection at all. Chomsky (1995) emphasizes that notions like "maximal" or "projection" are relational properties of syntactic categories that follow from their position in the syntactic tree. This means that a projection is necessarily the result of merging two elements of which one projects. But *trucks*, at first blush, does not seem to have a complex syntactic structure; it rather looks like a simple noun, quite similar to the noun *truck* in the compound *truck-driver*. Why then should *trucks*, but not *truck*, be analyzed as a maximal projection (and therefore as a phrasal complement)?

In order to explain why *trucks* in (1a) is an XP, we need to take into account the following observation. The use of the bare singular count noun *truck*, as the complement of a verb, leads to ungrammaticality; **John drives truck* is not well-formed in English. If the singular form is used, then a determiner needs to be added; *John drives a truck* is fine. This shows that before a count noun can be combined with a verbal head in syntax (such that the noun is the complement), we have to add either an inflectional element (a plural marker) or a determiner.[3]

Importantly, in contemporary syntactic theory, both kinds of elements are often associated with *functional structure*. Since Abney (1987), determiners are regarded as realizations of a functional head D that selects an NP. Number inflection is also taken to be associated with, or related to, functional structure inside the noun phrase (cf. e.g. Ritter 1991). Let us therefore assume that noun phrases like *a truck* or *trucks* are in fact functional phrases that are derived by combining at least one functional head with a bare lexical noun. In (2), I represent this head as D (I assume that D triggers (plural) inflection on the noun in a way to be specified below):

(2)



If we relate (2) to the observation that a bare noun like *truck* can only become a complement in its plural form or with a determiner, we arrive at the hypothesis that nouns can adopt phrasal status only through functional structure. Let us assume that nominal complements of verbs (or other lexical heads) are never bare nouns, but maximal projections of D-elements.

Generalizing this idea, I now suggest that one major task of functional categories is to turn bare lexical elements into possible phrasal complements. Grimshaw (1991) claims that every lexical head L is syntactically associated with at least one functional head F of the same categorial type. This functional head determines L's *extended projection*. I assume that functional elements allow bare lexical elements to take the form of phrases by deriving their extended maximal projections.

The presence of an extended projection can be made visible in two ways. First, a functional head may be realized through overt material (like e.g. a determiner in the case of nouns)[4], and second, functional structure may have a morphological reflex on the lexical head. The latter is what I take to be the essential function of inflection: inflectional morphology indicates the existence of an extended projection. I assume that a functional head always assigns a morphosyntactic inflectional feature to its corresponding lexical head; every lexical element with an extended projection is inflected.

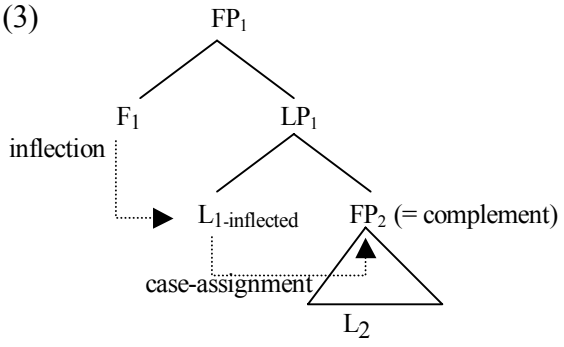
However, this does not imply that inflectional features are always phonologically visible. I follow Anderson (1982, 1992) and assume that the phonological side of inflection is determined by independent rules that operate at the interface between syntax and phonology (see also Halle & Marantz 1993). These rules take into account both inherent properties of lexical elements and the morphosyntactic specification determined by their local syntactic contexts. The relation between L and the functional head F of its extended projection is local enough for F to

assign a grammatical feature to L; morphophonological rules then determine this feature's phonological realization.

Of course, whether (and how) inflection is phonologically marked depends on properties of the language and the category and paradigm of the lexical element. For example, in English, plural nouns usually bear an inflectional suffix, whereas singular count nouns do not. In contrast, in the Bantu languages, which have rich systems of noun classes, every noun is marked by a concordial element that determines its class membership. Crucially, singular and plural are both marked through (different) classifiers (cf. e.g. Zulu *umfana*, 'boy', *abafana*, 'boys'). In German, case is morphologically marked on the determiner, but some singular count nouns may also (optionally) carry dative case markings (cf. *dem Mann-e*, '(to, for) the man'). In contrast, dative case of English nouns is phonologically unmarked. Similar typological differences concerning the phonological side of inflection can also be observed with respect to verbs, adjectives and prepositions.[5]

Thus, one way in which functional structure "introduces" lexical elements to syntax is by deriving extended projections. However, there is a second way in which a lexical element becomes syntactically activated through a functional element. Not only may the addition of a functional head F create a maximal projection FP of a lexical element L (thereby triggering inflection on L), but the presence of F may also allow L to take a complement and to project. This is directly related to the fact that certain grammatical properties of L, such as e.g. the ability to assign case, are licensed only if L has a functional shell:

(3)



As shown in (3), heads that take complements are either functional or inflected. If F triggers inflection on L, and L takes a complement, then L projects a non-minimal lexical node. At the point where L does not project any further, F merges with L's maximal projection LP.[6]

Notice that L_1's complement must itself be a functional projection FP_2. As argued above, if L_2 is a bare lexical element, it can only become a complement through functional structure. If L_2 takes itself a complement, it projects, but this again presupposes that F_2 is present, since only F_2 licenses L_2's ability to take a complement. Therefore, L_1's complement must always be an extended projection of L_2, i.e. FP_2.

I will call the place of grammar where structures like (3) are formed "core syntax". In core syntax, there is no direct merging of lexical material - this is only possible in the domain of word formation. Outside of (non-inflectional) morphology, lexical heads are always inflected and can only combine with functional phrases; lexical projections or intransitive lexical elements must combine with functional heads to derive extended projections. Returning to the original question, then, the combination of *drives* and *trucks* in (1a) takes place in core syntax and creates a VP because the verb is inflected and its complement is an extended projection of the noun (a DP). In contrast, the noun *driver* in (1b) is not inflected, and *truck* is a bare lexical element. Therefore, these two elements are merged morphologically, and no projection takes place. According to this conception, there is no principled distinction between the combinatorial rules of syntax and the combinatorial rules of morphology. Whether the output of these rules is a syntactic projection or a complex morphological object depends on properties of the elements involved in the combination.

With these assumptions in mind, let me now turn to particle verbs.

3. Particle verbs at the borderline of core syntax

One of the most controversial issues in the study of particle verbs is whether they are represented in syntax as verbal heads or as verbal projections, consisting of a verb and a phrasal complement that contains or represents the particle.[7] I will argue that particle verbs are structurally ambiguous; they are complex heads and projections at the same time.

This ambiguity is a result of conflicting properties of the verb and the particle.

As has been observed by various authors, particle verbs in all Germanic languages consist of a particle element that is merged with an *inflected* verb. In German and Dutch, this can be shown by comparing the infinitival forms of particle verbs with those of inseparable prefix verbs. The infinitival prefix (*zu* in German and *te* in Dutch) always precedes the whole prefix verb, which shows that the inflectional feature [-finite] is associated with the morphologically complex verb, (4). In contrast, the infinitival prefix always separates the particle from the verb, which shows that inflection affects only the base verb and never the whole particle verb, (5):

(4) a. *zu verfallen* - **verzufallen* (German)
b. *te vervallen* - **vertevallen* (Dutch)
'fall to pieces, ruin'

(5) a. *an-zu-rufen* - **zu anrufen* (German)
b. *op te bellen* - **te opbellen* (Dutch)
'call up'

In English, tense suffixes always attach to the verbal part of the particle verb and not to the complex verb + particle (cf. Kayne 1985). This also shows that the verb is already inflected when it merges with the particle:

(6) *look-ed up* - **look up-ed*

As argued in section 2, inflection signals the presence of functional structure, which licenses a lexical head's ability to take a complement. The fact that the verb is inflected therefore seems to support a phrasal analysis, according to which the particle would be (represented inside) a genuine complement of the verb, which must be an extended projection. However, as I show in Zeller (1999), particles are lexical elements that combine with the verb *without* intervening functional structure. I can only give a short illustration of the relevant arguments in the following, but see Zeller (1999) for a more detailed discussion.

Compare (7a) and (7b):

(7) a. *Hier strömt Luft heraus*
here streams air *her*-out
'Air escapes from here (out of some contextually given entity)'
b. *Hier strömt Luft aus*
here streams air Prt
'Air escapes here'

In (7a), the verb has combined with a so-called pronominal adverb, the postpositional element *heraus*, which is derived from the lexical preposition *aus* and the prefix *her*-. Van Riemsdijk (1990, 1998a) and Koopman (1993) analyze postpositional elements as *functional* heads. Van Riemsdijk (1990) argues that in constructions like *aus dem Haus heraus*, 'out of the house', the postposition combines with a PP-complement (*aus dem Haus*) and derives a prepositional FP. Examples like (7a) must therefore be analyzed as combinations of a verb and a prepositional FP which does not include a lexical PP:

(8) $[_{VP}\ [_{FP}\ heraus]\ strömen] = (7a)$

A postposition like *heraus* inherits the argument structure of the basic preposition from which it is derived. Therefore, *heraus*, like the preposition *aus*, has a Theme and a Source-argument (its reference object). The reference object can be expressed by a PP, but if no PP is present, as in (7a), it remains implicit. Therefore, while the Theme of *heraus* in (7a) is expressed by the DP *Luft*, its Source remains unrealized.

In contrast to (7a), *ausströmen* in (7b) is a particle verb. As in (7a), the Theme of *aus* is realized by the DP *Luft*, while the Source of the particle is left implicit. Importantly, however, there is a systematic semantic difference between particle verbs like (7b) and constructions like (8) where the verb takes a functional prepositional complement. Jackendoff (1983) argues that prepositional elements, like nouns, can be distinguished according to their ability to express tokens or types, i.e. they can be referential or non-referential. Adopting this idea, McIntyre (2000) observes that a prepositional FP headed by an element like *heraus* always expresses a *referential* Path. In contrast, prepositional particles always express types of Paths and are interpreted *non-referentially*.

As McIntyre (2000) notes, the interpretation of a prepositional element is linked to the interpretation of its reference object. A referential Path requires a referential reference object, which means that in (7b), where the reference object is implicit, it must receive its specific, token-like interpretation on the basis of contextual information. Therefore, (7a) can only be uttered felicitously if the discourse allows the hearer to identify a particular place (a whole in the wall; a pipe) as the Source of the air, such that the whole Path expressed by *heraus* can receive a referential interpretation.

In contrast, the particle in the example in (7b) expresses a non-specific type of Path. Consequently, the reference of the implicit argument of the particle is *not* contextually given. For example, if a speaker utters (7b), it may not be clear at all from where air is escaping. The relevant information here is only that air *is* escaping, but the Source, and therefore also the whole Path, remain non-specific.

In Zeller (1999) I relate this semantic difference to a syntactic difference between particle verbs and verb-FP-constructions. It is widely assumed that there is a correspondence between the referential interpretation of a phrase and functional structure, such that e.g. noun phrases can only be interpreted referentially if functional structure is present (cf. Stowell 1991; Longobardi 1994). Applying this insight to prepositional phrases, it follows that only PPs with an extended projection can be referential.[8] By the same token, the non-referential interpretation of particles can now be linked directly to the *absence* of functional structure:

(9) $[[_{\text{particle}}$ *aus*] *strömen*] = (7b)

According to (9), the particle lacks an extended projection and combines with the verb directly. Since a referential interpretation is only available if functional structure is present, it follows from (9) that particles like *aus* in (7b) can only express non-referential Path-types.

Additional evidence for the structure in (9) is provided by the fact that in examples where the Source-argument of the particle *aus* can be realized, it does not receive case from the particle, but from the verb:

(10) a. *Peter schüttet das Wasser aus dem Eimer* [V + FP]
Peter pours the water out-of the bucket$_{\text{dat}}$

b. *Peter schüttet den Eimer aus* [V + Prt]
Peter pours the bucket$_{acc}$ Prt
'Peter empties the bucket'

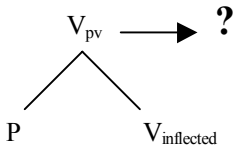
In (10a), we have a prepositional FP with an empty F taking the PP-complement *aus dem Eimer*. The DP *dem Eimer* receives dative case from *aus*. In contrast, if the prepositional element *aus* is used as a particle, the reference object of *aus* becomes the object of the particle verb. It now occurs to the left of *aus*, and it bears accusative case. This difference follows from the assumption that the case-assignment properties of a lexical node, which allow it to take a complement, are only licensed through functional structure. In (10a), due to the presence of a functional head, *aus* can take a complement and assign case to it. In contrast, *aus* is not able to assign case in (10b), since particles lack functional structure. Consequently, its reference object cannot be realized as a complement of *aus*, and it becomes an object of the verb, from which it receives accusative case.

Finally, the claim that particles do not project functional structure is also confirmed by nominal particle verbs in German. As noted in section 2, singular count nouns in English require a determiner in order to become a phrasal complement. The same condition holds for German, (11a). However, nominal particle verbs are characterized as verbs that combine with bare lexical nouns, (11b):

(11) a. **Peter wäscht Auto*
Peter washes car
b. *Peter fährt Auto*
Peter drives car, 'Peter is a car-driver'

If we exclude (11a) by assuming that the D-head of a singular count noun-DP must be obligatorily realized, then the occurrence of the bare noun in (11b) is explained by assuming that the nominal particle is a bare noun, such that the condition applying to (11a) is trivially fulfilled in (11b). Consequently, the noun in (11b) receives a non-referential, token-like interpretation.

According to the results of this section, the structure of particle verbs looks like (12):

(12) 

Particle verbs are combinations of inflected verbs and lexical elements without a functional shell. It is clear that in light of what has been argued in section 2, this is a rather unexpected result. I have assumed that in core syntax, inflected heads combine with functional phrases and project, whereas the combination of plain lexical material only takes place in morphology and never triggers projection. However, the verb-particle construction does not fit smoothly into either of these domains; the properties of its parts provide contradictory information about the status of V_{pv}, the node that dominates the particle and the verb. On the one hand, the verbal part of a particle verb is an inflected element. Since inflected elements can take complements and project, the particle verb should be a verb-complement construction, in which case V_{pv} = V' or VP. On the other hand, the particle lacks an extended projection. This should prevent the particle from being a complement, and therefore should cause V_{pv} not to be a projection, but a complex verbal head.

How then do particle verbs fit into the architecture of grammar? My answer to this question relies on the assumption that core syntax and morphology do not exclusively define the whole set of legitimate grammatical objects. After all, most studies about particle verbs emphasize that the verb-particle construction is a phenomenon at the "borderline" between syntax and morphology, because it has properties of both verbal projections and of verbal heads. The structure in (12) states explicitly in what sense particle verbs are a borderline phenomenon. From the verbal perspective, V_{pv} is a projection of the verb, since the verb is inflected, a situation characteristic of verb-complement constructions. From the particle perspective, V_{pv} looks like a (morphologically complex) head, because it consists of a bare lexical element merged with a verb. The latter point excludes an analysis according to which particle verbs are formed in core syntax. Nevertheless, I claim that grammar not only tolerates a structure like (11), but it may even interpret this structure from both perspectives that exist as a result of its ambiguous

properties. The node created by merging the inflected verb with the particle may be interpreted as both a verbal projection and as a head when syntactic operations and movement rules are applied to a structure like (12).

Before discussing the empirical implications of this idea, let me briefly address a possible objection raised against the claim that grammatical structures may be ambiguous. Although ambiguous structures have occasionally been suggested in the literature (mostly in terms of multi-dimensional or non-tree-representable structures; cf. the overview in van Riemsdijk 1998b), the general assumption is that structures are always either unambiguously syntactic or morphological, and that "intermediate" cases cannot exist. One might therefore object that a structure like the one I proposed for particle verbs should strictly be excluded, because it satisfies neither the conditions that hold for structure-building processes in core syntax nor those that govern word formation in morphology.

However, notice that intermediate judgements are not unusual in other cognitive domains such as conceptual categorization and semantics. Jackendoff (1983) discusses categorization tests which show that boundaries between certain concepts cannot precisely be defined. For example, when people are asked to label containers that differ in the ratio of width to height as either "vases", "cups" or "bowls", it turns out that to some intermediate cases, a "not sure"-response is given. Given that word meanings are also expressions of conceptual structure, it is not surprising to find the same graded judgements in the semantic domain. For example, it might be difficult to judge in some cases whether a particular color is an instance of the concept expressed by the word "red". Jackendoff (1983: 117) concludes that "fuzziness is an inescapable characteristic of the concepts that language expresses"; their internal structure cannot be defined on the basis of necessary and sufficient conditions alone, but is also characterized by graded conditions.

In the light of this conclusion, it is perhaps not too far-fetched to assume that not only semantic concepts, but also syntactic structures, may be "fuzzy" and permit intermediate judgements. In the same way in which it is not always possible to define something unambiguously as a vase or a cup, there might be constructions for which it is impossible to give an unambiguous structural description as either a projection or a head. As I show in the next section, the properties of particle verbs sug-

gest that these constructions are in fact hybrids and that any account that treats them as either genuine syntactic constructions or morphological objects is an inappropriate idealization.

4. Consequences

In this section, I show that with respect to syntactic movement rules, particle verbs exhibit properties both of phrasal constructions and of complex verbal heads. These empirical facts support the analysis presented in section 3.

4.1. Verb Raising in Dutch

In so-called Verb Raising constructions, an embedded infinitive raises and attaches to the right of the matrix verb. If the embedded infinitive is a particle verb, two options exist. Verb Raising can trigger only the base verb, and the particle is stranded, (13a), or the particle verb moves as a whole, (13b):[9]

(13) a. *dat Jan zijn moeder op* t_i *wil* [*bellen*]$_i$
that Jan his mother Prt wants phone
b. *dat Jan zijn moeder* t_i *wil* [*opbellen*]$_i$
that Jan his mother wants Prt-phone
'that Jan wants to call up his mother' (Neeleman 1994: 24)

The two options in (13) are explained by the claim that the structure of particle verbs is ambiguous. In (13a), V_{pv} is analyzed as a projection of the verb. Consequently, the syntactic head of V_{pv} is the base verb, and therefore, only the base verb undergoes Verb Raising. In (13b), V_{pv} counts as the head itself and undergoes Verb Raising as a whole.

Particles differ from intransitive prepositions which have extended projections and are genuine syntactic phrases. Therefore, my analysis predicts that verbs that combine with intransitive projections unambiguously project. Consequently, the combination of a verb and an intransitive preposition is never expected to move as a complex head in

Verb Raising constructions. This expectation is borne out, as shown in (14):

(14) a. *dat Jan boven* t_i *wil* [*wonen*]$_i$
that Jan upstairs wants live
'that Jan wants to live upstairs'
b. **dat Jan* t_i *wil* [*boven wonen*]$_i$ (den Dikken 1995: 30)

The next example illustrates the same thing. The Dutch complex verb *voorstaan* is ambiguous in that *voor* can either be read as a particle or as an intransitive-preposition. This ambiguity remains if only the verb undergoes Verb Raising. However, if *voorstaan* moves as a complex head, only the particle reading is available (cf. van Riemsdijk 1978: 55):

(15) *omdat hij voor* t_i *schijnt* [*te staan*]$_i$
a. 'because it (e.g. the dustbin) seems **to stand in front**'
(intransitive preposition-reading)
b. 'because it (e.g. the team) seems **to be leading**'
(particle reading)

(16) *omdat hij* t_i *schijnt* [*voor te staan*]$_i$
(only particle reading)

(15) might be represented by two different structures, either as a verb that takes a full FP-complement (reading (15a)) or as a particle verb (reading (15b)). However, only if no functional structure intervenes between *voor* and the verb can the node that dominates both be interpreted as a complex head and undergo Verb Raising. Therefore, if Verb Raising moves the whole verb *voorstaan*, it must be a particle verb, and the intransitive-preposition-reading is no longer available.

4.2. Particle shift in English and Norwegian

The theory outlined in sections 2 and 3 allows me to link the behavior of Dutch particle verbs in Verb Raising constructions to the well-known phenomenon of particle shift in English and Norwegian:

(17) a. *John* [*drank*]$_i$ *his beer* t$_i$ *up*
b. *John* [*drank up*]$_i$ *his beer* t$_i$

(18) a. *Mannen har* [*drukket*]$_i$ *vinnen* t$_i$ *opp*
b. *Mannen har* [*drukket opp*]$_i$ *vinnen* t$_i$
'The man has drunk up the wine' (Svenonius 1996: 10)

In English and Norwegian, which are both SVO, the bare particle element is generated to the right of the verb. The verb then undergoes leftward movement. Since the node V_{pv} that dominates the particle and the verb has the same ambiguous properties as V_{pv} in German and Dutch, there are now two options. V_{pv} might be a V' or VP, and then only the verb moves, (17a) and (18a). Alternatively, V_{pv} moves as a complex head, consisting of the particle and the verb, (17b) and (18b).

As is the case with Verb Raising, the complex-head option is not available for combinations of a verb and functional projections. For example, resultative predicates have extended projections, and consequently, they normally cannot undergo particle shift:

(19) a. *The doorman* [*beat*]$_i$ *the drunks* t$_i$ *senseless*
b. **The doorman* [*beat senseless*]$_i$ *the drunks* t$_i$

(20) a. *Kokken* [*brennte*]$_i$ *kyllingen* t$_i$ *svart*
b. **Kokken* [*brennte svart*]$_i$ *kyllingen* t$_i$
'The cook burned the chicken black' (Svenonius 1996: 11)

There are a few examples where a verb and a resultative adjective can move together. However, there is evidence from Norwegian that in these cases, the structure is in fact an adjectival particle verb. Resultatives in Norwegian are obligatorily inflected in the order V-Object-Prt, but they typically appear in non-agreeing forms in the order V-Prt-Object (cf. Åfarli 1985: note 8; Svenonius 1996: note 4):

(21) a. *Vi vaska golvet rein**t*** → functional structure
we washed floor$_{Sg.N}$ clean$_N$

b. *Vi vaska rein golvet* → no functional structure
we washed clean the-floor
'We washed the floor clean'

The fact that the adjectival resultative predicate in (21a) is inflected proves that it has an extended projection. The observation that inflection is omitted in (21b) suggests that in this example, no functional structure is present and that therefore, the combination of the verb and the adjective is a particle verb which has undergone movement as a complex head.

4.3. Particle topicalization

There is a clear contrast between separability of particle verbs through *verb* movement and separability through *particle* movement. Whereas the verb always can move away from the particle (as, for example, in Verb Raising and particle shift), particles cannot be moved so easily. For example, although there are some contexts that permit topicalization of the particle, (22a), other examples are at most marginally acceptable, (22b), while most examples are ruled out completely, (22c). Judgements differ sometimes drastically from speaker to speaker; the judgements in (22) are mine:

(22) a. *Auf geht die Sonne im Osten*
Prt goes the sun in-the east
'The sun rises in the east'
b. ?**Auf werden sie die Bühne um 4 Uhr bauen*
Prt will they the stage at 4 o'clock build
'They will set up the stage at 4 o'clock'
c. **Auf hat Peter mit dem Trinken gehört*
Prt has Peter with the drinking heard
'Peter stopped drinking'

In the literature, data like those in (22) have been interpreted in different ways, mostly depending on the theory. Whereas proponents of the 'particle-verbs-as-heads'-approach emphasize the ungrammaticality of ex-

amples like (22c) and treat examples like (22a) in the footnote section, only grammatical examples like (22a) are used as evidence by linguists who support a phrasal analysis. However, I think it more appropriate to take the problematic character of particle topicalization at face value. If the data are controversial and if judgements differ from speaker to speaker, then this is what should be explained by the theory. The proposal made in this paper might offer a first step towards such a theory.

Crucially, my proposal permits an analysis of particle verbs as projections of the verb without the implication that particles are phrasal complements. This means that the possibility of separating the verb from the particle does not imply that the particle is a genuine syntactic phrase. Even if V_{pv} is understood as a projection, the particle is still a bare lexical element. Therefore, it is predicted on the one hand that phrasal movement of the particle is impossible. On the other hand, it is precisely because the whole particle verb can be interpreted as a projection that the particle might be interpreted as a complement *indirectly*, namely by virtue of being merged with a projecting head. This, however, will always be a marked option, and it will only be possible in special contexts.[10]

This claim is interesting in light of the following observation made in Zeller (1999). A sentence with a topicalized particle sometimes improves if the verb moves as well. Compare (23) to (22b) above and (24a) to (24b):

(23) ? *Auf bauen sie die Bühne um 4 Uhr*
Prt build they the stage at 4 o'clock
'They set up the stage at 4 o'clock'

(24) a. ?**Ab ist Nixon 1974 getreten*
Prt is Nixon 1974 stepped
b. ?*Ab trat Nixon 1974*
Prt stepped Nixon 1974
'Nixon resigned in 1974'

In (23) and (24b), the base verb has undergone movement to Comp (see section 4.5.). Since movement of the verbal part of a particle verb is contingent on interpreting V_{pv} as a projection, the phrasal interpretation

of the particle, which is necessary for topicalization, is available more easily in (23) and (24b) than in (22b) and (24a), where no verb movement has taken place.

4.4. Modifiers

It has been observed (e.g. by Koopman 1993) that with a very few exceptions, particles cannot be modified with adverbs. This again follows from the fact that particles are bare lexical elements. Because adverbs can only be adjoined to phrases, adverbial modifiers should be excluded on general grounds.

However, exceptions do exist. In English and Norwegian, for example, some prepositional particles can be modified with certain kinds of adverbs (cf. Emonds 1972; den Dikken 1995):

(25) a. *John looked the information* ***right*** *up*
b. *Jon sparka hunden* ***langt*** *ut*
Jon kicked the-dog far out (Åfarli 1985: 76)

The precise conditions under which an adverb can modify a particle in English and Norwegian are not clear to me, and I do not have an explicit account to offer here. However, it seems reasonable to assume that modification of a particle, like the examples of particle topicalization discussed above, requires a reinterpretation of the particle as a phrase, triggered by the possibility of interpreting particle verbs as non-minimal verbal projections.

If adverbial modification is contingent on the interpretation of the particle verb as a projection, we expect it to be impossible if the verb is interpreted as a complex head. The prediction therefore is that whenever particle verbs in English and Norwegian undergo particle shift, adverbial modification should be excluded, since particle shift implies that V_{pv} is interpreted as a head. This prediction is borne out. The adverbs in (26) cannot modify the particle if the particle verb moves as a whole:

(26) a. **John looked* ***right*** *up the information*
b. **Jon sparka* ***langt*** *ut hunden*
Jon kicked far out the-dog (Åfarli 1985: 76)

In Dutch Verb Raising constructions, a similar picture emerges. Certain postpositions can be reanalyzed as particles (cf. Groos 1989) and may undergo Verb Raising with the verb, (27a). Some of these postpositions can be modified by adverbs, (27b). However, the adverb is only licensed when the verb moves alone and leaves the particle behind, (27c):

(27) a. *dat Jan de bal* t_i *heeft* [*over geschoten*]$_i$
that J. the ball has over shot
b. *dat Jan de bal* ***vlak*** *over* t_i *heeft* [*geschoten*]$_i$
that J. the ball right over has shot
c. *dat Jan de bal* t_i *heeft* [****vlak*** *over geschoten*]$_i$
that J. the ball has (right) over shot
(cf. Den Dikken 1995: 108)

4.5. Verb second

The final point that I want to address concerns the separability of particle verbs under verb second (V-2). If grammar generally allows for two options to interpret V_{pv}, why is only one of them licensed when the verb moves to Comp?

(28) a.	*Peter steht auf*	V_{pv} = projection, the particle is
	Peter stands up	stranded
b.	**Peter aufsteht*	V_{pv} = head, the whole particle
	Peter up-stands	verb moves to Comp

For reasons of brevity, I do not provide much discussion here, but there is evidence that sentences like (28b) are excluded by independent restrictions on V-2. McIntyre (2000) argues that complex heads are not licensed in Comp if they are initially accentuated. This constraint explains the contrast in (29):

(29) a. *Linguisten überschätzen ihre Arbeit*
linguists Pref-estimate their work
b. *?*Linguisten überbewerten ihre Arbeit*
linguists Pref-[Pref-estimate] their work
'Linguists overestimate their work'

Both complex verbs in (29) are formed with the inseparable prefix *über*. Prefixes in German are unstressed, and therefore, *überschätzen* in (29a) can move to Comp. However, in (29b), *über-* has combined with *bewerten*, which is itself a prefix verb. Since a succession of unstressed syllables is excluded on phonological grounds, the prefix *über-* in (29b) must be accentuated, as an exception to the general rule. According to McIntyre, this prevents the resulting verb *überbewerten* from moving to Comp.

Since particles are always accentuated in German and Dutch, the sentence in (28b) is excluded by the same principle that rules out (29b). If V_{pv} could only be interpreted as a complex head, we would never expect particles to occur in V-2. However, since V_{pv} can also be interpreted as a projection, this consequence can be avoided if the inflected verb moves and the particle is stranded. In contrast to Verb Raising, which is not restricted by phonological conditions, the "phrasal" option is the only one available in V-2.

5. Conclusion

I have argued that the node that dominates the particle and the verb is ambiguous - it has properties of both phrases and heads. Particle verbs cannot be genuine verb-complement constructions, because the particle lacks an extended projection, but they cannot be true morphological objects either, because the verb is inflected before it combines with the verb. Therefore, I have suggested that particle verbs stand somehow "in between" syntax and morphology, and it is a consequence of this idea that the representation of particle verbs can be interpreted both as a phrasal construction and as a complex head.

I have shown how this idea accounts for the ambiguous behavior of particle verbs with respect to *syntactic* rules like verb movement and topicalization etc. But given that particle verbs are a borderline phe-

nomenon, we now expect that the ambiguous status of particle verbs can also be exploited by the *morphological* module. It is well-known that particle verbs can form the input to morphological processes of word formation. Therefore, their status as structurally ambiguous elements might also be reflected in the way word formation processes affect particle verbs. The implications of the latter idea are not explored in this paper, but I am convinced that they provide an interesting topic of future research.[11]

Notes

1. So-called phrasal compounds like *The who-is-who-question* (cf. Lieber 1992) are exceptions that I ignore here.
2. I follow Selkirk (1982) and DiSciullo & Williams (1987), among others, in assuming that synthetic compounds like *truck-driver* have a structure like (i).
   (i) $[_N [_N$ truck] $[_N$ driv-er]]
   See Lieber (1983) for an alternative proposal.
3. See Stowell (1991) and Zeller (1999) for a discussion of mass nouns and exceptional constructions like *He eats fish* or *He is president*.
4. *Verbal* functional elements are e.g. auxiliaries or modals. Van Riemsdijk (1990, 1998) argues that the functional head of a *preposition's* extended projection may be realized through postpositions (see section 3). Examples of functional elements in the *adjectival* domain are degree words (see Corver 1997).
5. My proposal implies that all lexical elements can be inflected in a morphosyntactic sense. This claim is substantiated by the observation that there are languages where even prepositions show a phonological reflex of inflection. As noted by Spencer (1991: 29), certain prepositions in Welsh show visible agreement with their complements.
6. Of course, there can be more than one level of projection between L and its maximal projection, depending on the number of arguments that L selects.
7. See the references cited in Zeller (1999) for proponents of the complex-head approach and the phrasal approach.
8. The fact that the Path-token-reading of the FP in (7a) is brought about via reference to a contextually given entity makes these FPs similar to nominal proforms, whose reference might also be determined by the context. This semantic parallel also corresponds to the syntactic parallel between the FP-structure proposed for (7a), which consists solely of the functional proform *heraus*, and the structure proposed for pronouns, which are assumed to be bare D-elements without NP-complements (cf. Abney 1987; Chomsky 1995).
9. There is clear evidence that what raises in (13b) can only be a head. As shown in (i), movement of a verb plus a complement to the right of the matrix verb is excluded in Dutch:

(i) **dat hij* t_i *wilde* [*een huis kopen*]$_i$
that he wanted a house buy

10. For example, as has been observed by Lüdeling (1998), Wurmbrand (1998), and Zeller (1999), it is a necessary (but not always sufficient) condition for particle topicalization that a contrastive reading of the particle is available.
11. The consequence of this idea might in fact be visible in English, which has two options to derive nouns from particle verbs:
    (i) a. *turn up* *the upturn (of the economy)*
    b. *reach out* *an outreach-program*
    c. *cut off* *the offcuts (pieces of meat)*
    d. *look out* *the outlook (point of view)*
    (ii) a. *take AWAY* *the TAKE-away*
    b. *break THROUGH* *the BREAK-through*
    c. *cut OFF* *the CUT-offs (pants)*
    d. *look OUT* *the LOOK-out (observation post)*
    (i) and (ii) might be taken as reflexes of the idea that particle verbs can occur in morphology as either heads or phrases. In (i), the particle verb is a nominal compound, and therefore, the particle precedes the verb, as predicted by the Right-hand Head Rule. In (ii), the phrasal structure of particle verbs has been preserved and the particle still follows the verb. However, this phrasal structure has been reanalyzed as a word, and the reanalyzed structure bears compound stress on the verb (cf. DiSciullo & Williams 1987).

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