Introduction

Nicole Dehé, Ray Jackendoff, Andrew McIntyre, Silke Urban

The contributions in this book are a representative cross-section of current research on the Germanic constructions of the type in (1), known as particle verbs, verb-particle combinations, phrasal verbs or separable verbs. The book reflects our belief that progress towards solving the difficult problems raised by them is more likely under an eclectic approach, by which we mean that the book gathers insights from various linguistic subdisciplines (from psycholinguistics to pure linguistics), various theories and methodological strategies (e.g. minimalism, construction grammar, lexical functional grammar, as well as more theory-neutral, empirical approaches) and various languages (chiefly: Dutch, English, German and Swedish).

(1) a. ring up, throw away
    b. ringa upp, kasta bort  (Swedish)
    c. opbellen, weggooien    (Dutch)
    d. anrufen, wegwerfen    (German)

1. Basic facts and questions about particle verbs

We begin with a summary of some basic facts regarding the syntactic behaviour of particles. This will enable us both to identify some of the problems which make particle verbs (henceforth pv’s) worth studying, and at the same time help readers to follow our attempt at integrating the contributions in this volume into the overall research landscape. Our overview gives the minimal information required for this; for more detailed summaries of the grammar of particles in each language, see the articles by Jackendoff (English), Booij (Dutch), Toivonen (Swedish) and Zeller (German). For a comprehensive
cross-linguistic overview of the phenomena and literature concerning pv’s, see Haiden (2001).

In English, the particle can appear on either side of a direct object, unless it is a (non-contrastively accented) pronoun (cf.2). In Swedish, the particle obligatorily precedes the nominal object, as illustrated in (3) (cf. Toivonen, this volume). In German (4), a (non-topicalised) particle appears in a fixed position at the end of the clause, but preceding verbs in final position, if any. Thus, the particle and verb are separated by the verb-second phenomenon in main clauses, (4a-b), but are adjacent in embedded clauses (4c-d). Dutch behaves similarly, (5), except that Dutch embedded clauses allow the optional interpolation of an auxiliary between the particle and the verb, cf. (5c,d).

(2) English
a. John called up the girl.  John called her up.
b. John called the girl up.  *John called up her.

(3) Swedish
a. John skrev upp numret.
   John wrote Part number.the
   John wrote number.the Part
   ‘John wrote down the number.’

(4) German
a. John rief das Mädchen an.
   ‘John rang the girl up’
b. *John anrief das Mädchen.
c. ... daß John das Mädchen anrief
   d. *... daß John rief das Mädchen an

(5) Dutch
a. John belde het meisje op.
b. *John opbelde het meisje.
c. ...dat John het meisje wil opbellen.
d. ...dat John het meisje op will bellen.

These examples use prototypical particle-verb constructions, in which the verb is (homonymous with) an ordinary verb of the language, and the particle is homonymous with a preposition. But when we attempt to characterize the class of particle verbs (hereafter pv’s) as a whole, we discover that as yet, there is no uncontroversial definition of particles which reliably demarcates them from similar items and has cross-linguistic validity. In lieu of attempting to formulate such a definition, we must content ourselves with a presentation of the relevant issues.

A first approximation for a theory-neutral definition of (the unmarked case of) Germanic particles might run as follows. A particle is an accented element which is formally (and, often, semantically) related to a preposition, which does not assign case to a complement and which displays various syntactic and semantic symptoms of what may informally be called a close relationship with a verb, but without displaying the phonological unity with it typical of affixes. Some aspects of this close relationship are the following:

1. Particles often form idiomatic units with verbs. Significant numbers of pv’s must be lexically listed since either or both of the constituents fails to make a contribution to the meaning of the whole structure which can be predicted on the basis of its behaviour outside it. Consider e.g. hold up a bank, Dutch aanvangen, begin ‘catch on’ or German aufhören, cease ‘hear up’.

2. In English and Swedish, the particle can intervene between verbs and direct objects, a privilege not enjoyed by apparently functionally identical directional PP’s and resultative AP’s (particles in small caps; non-particles in ordinary type):

(6) a. I carried {in/ off} inside/ into the house} the boxes.
   b. I wiped {down/ clean} the table.
   c. Johan skrev upp numret {*upp} (Swedish)
      ‘J. wrote down the number’
   d. Johan ställer {*dar} glaset {dar} (Swedish)
      ‘Johan puts the glass there’

3. There are derivational processes which take pv’s as input where semantically parallel constructions are ruled out. This is most clearly
seen in German and Dutch, in which pv's freely feed all kinds of affixation processes where semantically parallel PP and AP constructions are very marginal (modulo points noted by Lüdeling and de Jong, this volume). Minimal pairs like (7) are sometimes noted in the literature. (The Dutch examples in (7) are from Neeleman and Weerman 1993a: 439.)

(7) a. Rumgelaufe ‘running around’ (<rumlaufen ‘run around’) (German)
   a'. *Ums-Zimmer-Gelaufe ‘running round the room’
   b. toelaatbaar ‘permissible’ (<toelaten ‘permit’) (Dutch)
   b'. *groenverbaar ‘able to be painted green’ (<groen verven ‘paint green’)

4. English -ing nominalisations show a marked preference for contiguity between particle and verb:

(8) a. the heating up of the stove / ?? the heating of the stove up
   b. my taking down of the flag / ??my taking of the flag down

5. In German and Dutch subordinate clauses, particles must be verb-adjacent. This does not distinguish them from resultative predicates or PP complements, but the following examples show that adverbials having a similar semantic effect enjoy more freedom in this respect.

(9) a. wenn {*auf} ein Licht {auf}leuchtet if up a light up-lights
   ‘if a light flashes (i.e. lights up suddenly and goes off again)’
   b. wenn {plotzlich} ein Licht {plotzlich} leuchtet if suddenly a light suddenly shines

6. Standard German (but not Dutch) insists on adjacency between particle and verb in verb clusters, while standard resultative predicates show greater flexibility. The following minimal pair is representative:

(10) a. ... daß er den Tisch {*ab} wird {ab}wischen wollen
    ... that he the table {off} will {off} wipe want
    ‘that he will want to wipe down the table’
   b. ... daß er den Tisch {sauber} wird {sauber}wischen wollen
    ‘that he will want to wipe the table clean’

There are difficulties in arriving at clear diagnostics for particlehood. For instance, being an intransitive preposition is neither a necessary nor a sufficient condition for fulfilling the syntactic tests for particlehood just listed. Toivonen (this volume) observes cases where elements of non-prepositional origin occupy the verb-adjacent pre-object position reserved for particles (cf. English take home the food, cut short the session, as well as the structures with nominal nonheads discussed in van Marle’s contribution). On the other hand, certain English intransitive prepositions cannot occupy the particle position:

(11) *I pushed {forwards/around/outside} the car

Even the above basic facts force us to decide on many difficult and interesting questions, some with significant consequences. Some of these questions concern the properties of particles. What property of an item like in allows it to occur in the particle position when inside does not? How do speakers learn this? Given the imperfect correlation between intransitive prepositionhood and particlehood, how can we capture in synchronic grammar the fact that prepositional particles are far less marked compared to particles cognate with words of other categories? Logically possible answers range from the view of traditional grammarians that particle is a category unto itself to a position (not yet explored) that all Germanic particles are prepositional, even if they have nominal origins.

Other questions pertain to the nature of the whole pv construction. Where the tests for pv status do pick out a uniform class, what is responsible for the uniformity? Does the pv construction possess primitive status in the form of a lexical entry, or can its existence be predicted from the lexical entries of the elements concerned and independent facts in the respective languages? What is the syntactic structure associated with these constructions in each language? Is it
the same in all languages, or must we specify provisions in the theory of Universal Grammar to account for the similarities and differences? Are the alternative word order patterns involving particles (such as the varying order of English particles and objects in (2) or of Dutch particles and auxiliaries in (5c,d)) in free variation, challenging some (e.g. Minimalist) theorising, or do the serialisation differences correspond to other (e.g. semantic, information-structural) differences? What theories of the morphology-syntax interface can describe the interaction of pv's with morphology, as in the derivations in (7)? Further questions attend the syntax-semantics interface. What semantics can be associated with these constructions and how do particles interact with verbal argument structures? In a given language, is the syntactic structure the same for all the different semantic interpretations assigned to the construction? And what problems do pv's present for language processing and production and for language acquisition theories? These, among many other questions raised by pv's, have been the subject of continuous debate and their answers are far from settled.

2. Approaches to the structure of particle verbs

We now discuss the syntactic structure of pv's, with a view to integrating those contributions in the book concerned with this topic into the overall picture of the research. We begin with a brief overview of what may be seen as the 'standard' approaches already available.

One well-represented type of approach (let us call it the secondary predicate approach) holds that the particle and direct object underlyingly form a constituent. The most common manifestation of this is the assumption that the particle predicates over the postverbal NP in a small clause (SC). The structure is exemplified in (12) for English.

(12) \([\text{VP} \ldots \text{write} \text{ [SC [NP \text{the number}] [Particle \text{down}]]}]\)


A second type of analysis for pv's assumes that the particle and verb underlyingly form a constituent to the exclusion of the direct object. Studies assuming this type of approach (call it the complex predicate approach for convenience) divide into two main groups, viz:

- The morphological approach. Here the particle and verb combine presyntactically, in a component of grammar referred to as the morphology and/or the lexicon, yielding a complex head with the structure \([v \text{ V Part}]\). Various different mechanisms have been proposed to deal with the syntactic independence or excorporation of the particle. See e.g. (for English) Johnson (1991), Koizumi (1993), Olsen (1997a, 2000), Déhé (2001), (for German) Stiebels and Wunderlich (1994), McIntyre (2001b), (for Dutch) Neeleman (1994), Neeleman and Weerman (1993a).

- Syntactic complex predicate approaches. Here the verb and the particle enter the syntax as separate heads, forming a phrasal constituent (often V') which excludes the object. In Generative circles, this analysis is often integrated into a VP shell structure (Larson 1988, Hale & Keyser 1993), yielding a structure like (13), based on Zeller (1999:194). The pv is initially a V' structure; in English, the verb (with or without the particle) moves across the object to a higher v position. Among many proponents of what we call the syntactic complex predicate approach are Zeller (2001), Lüdeling (2001), Müller (2001) for German, Booij (1990) for Dutch, Radford (1997) for English and Haider (1997a) for a pan-Germanic perspective.

(13) \([\text{VP} \ldots \text{write} \text{ [VP [NP \text{the number}] [V [v t] [PP \text{down}]]]}]\)
The above taxonomy is of course only rough and we will see shortly that several analyses – from this book and elsewhere – do not fit into it. Moreover, it is worth noting that there are hybrid analyses. For instance, some writers argue that some pv’s involve SC’s while others are complex predicates (e.g. Aarts 1989, Wurmbrand 2000).

Having given the necessary background concerning the syntactic behaviour of pv’s and the analyses which have been proposed for them, let us now comment on the analyses in the book most directly concerned with these questions.

Jochen Zeller’s article fits into the complex predicate approach. He proposes that pv’s can occur in two different structures, either as syntactic verb+complement projections or as morphological V° structures, the latter structure being derived from the former by reanalysis. According to Zeller, the peculiarity of pv’s which renders them susceptible to alternative parses is that particles are not dominated by functional structure, in contradistinction to other apparently similar objects (e.g. resultative adjectives). Perhaps the main merits of Zeller’s article are its attempt to face all the questions posed by an analysis of pv’s in various languages (Dutch, English, German, and Norwegian), and its novel solution to the longstanding paradox in which pv’s appear to have both morphological and syntactic traits. The nearest thing to Zeller’s reanalysis proposal in earlier literature is perhaps the recourse to syntactic incorporation of the particle into the verb, forming the structure \[ v Part \text{V} \]. This also attempts to derive the what are sometimes called the wordlike properties of pv’s. Many studies use this strategy, see e.g. Grewendorf (1990), Harley and Noyer (1998), Radford (1997).

Ida Toivonen presents a lexical-functional grammar approach to Swedish pv’s. She argues that the ability of Swedish particles to intervene between verbs and direct objects is not sensitive to generalisations about the category or grammatical function of the particle, and should not be derived by movement. Instead, the peculiar behaviour of particles is explained by the hypotheses that they are lexically specified as non-projecting and that a special phrase-structure rule sanctions their adjunction to the verb. The distinction between projecting and non-projecting words is argued to be independently needed to account for the divergent behaviour of clitics. It is instructive to compare Toivonen’s proposal to other studies. Her belief that particles do not project is shared by authors treating pv’s as morphological objects. These studies form pv’s by merging the constituents in a component of grammar distinct from the syntax, in much the same way as compounding is derived in lexicalist analyses, while Toivonen combines the constituents syntactically. Toivonen’s account comes closest to a proposal of Groos (1989), who analyses Dutch pv’s as syntactic base-adjunctions of a non-projecting intransitive preposition to a verb. Note also that Toivonen’s dichotomy “projecting vs. non-projecting” is parallel to “projecting functional structure vs. lacking functional structure” in Zeller (2001, this volume).

Fabrice Nicol’s contribution suggests an extended VP-Shell analysis in the Minimalist tradition. The particle is inserted under an additional light head \( w \) within the functional domain of the lexical verb, the \( w \) head expressing directional or possessional content. The particle has a formal checking feature which is either nominal (\([+N]\)) or verbal (\([+V]\)). According to the category of the feature it bears, the particle (or \( w \) head) triggers either movement of the verbal head to \( w \), or DP-movement to Spec-wP, resulting in the derivation of the constructions given in (2a) or (2b), respectively. Nicol’s article is an important attempt to explain the alternation that is possible with the English pv. Nicol applies some of the most recently suggested principles to account for empirical phenomena, some of them previously ignored. Note that Nicol’s account is a radical departure from the taxonomy of ‘standard’ approaches given at the beginning of this section, for the particle is the lexicalisation of a functional head projected above the verb. The nearest predecessors in the literature are Sola 1996 and Dehé 2000a, who argued that the particle occupies a functional head position higher than the initial verb position, but these authors, unlike Nicol, assume that this head position lexicalises telicity, a feature strongly associated with particles (e.g. Brinton 1985).

Ad Neeleman presents a different account of the word order alternation. He compares the word order in pv’s in Dutch and English, noting the surprising fact that although in other domains word order is more strict in English than in Dutch, a scrambling language, Eng-
lish displays more freedom with regard to particle placement. Neeleman argues that the OV/VO parameter is ultimately responsible for the contrast between the two languages with regard to the behaviour of the particle. Neeleman’s article is therefore an important contribution to some of the basic questions that this volume seeks to treat. First, he proposes a complex-predicate structure (in the above-defined sense) for the pv in English and Dutch (which might apply directly to Norwegian and Icelandic on the one hand and German on the other, but this would be the subject of an additional investigation). Secondly, with regard to the question of whether a syntactic account of pv’s can be universal, he argues that the grammars of the two languages he considers are “identical in all relevant respects”, but that they differ only in one parameter, namely the OV/VO parameter.

Geert Booij proposes that particle verbs have a phrasal structure yet are constructional idioms created in the lexicon. This is implemented through recourse to the partly underspecified phrasal idioms of construction grammar (Goldberg 1995, Jackendoff 1997a,b). For instance, the durative use of Dutch door is captured by the structure in (14a), where the variable can be replaced by a suitable verb. The problem of elements which can be used as verb stems only in the company of a particular particle is solved by means of templates of the type in (14b), obviating the need to see the particle as the head of the whole construction. This essay, like that of Zeller, is part of a tradition which posits a structure for pv’s which allows them to behave in ways characteristic of both morphological and syntactic structures.

A different approach in this tradition was advanced by Booij (1990), who suggested pv’s are dominated by the node V*, which is stipulated to have both lexical and syntactic properties. The tension between the wordlike and phraselike properties of pv’s is also addressed in work by Ackerman and Webelhuth (1998) on German pv’s and of Ackerman and LeSourd (1997) on Hungarian preverbs (which, incidentally, resemble Germanic particles in interesting ways.)

Ray Jackendoff offers an overview of the grammar of English pv’s and a taxonomy of the semantic effects of particles. He notes that only a subset of pv’s, including idiomatic (blow up) and semiproductive combinations (cook the food over) are lexically listed. Based on the observation that a wide range of (English) pv’s are syntactically uniform but vary in their semantics, argument structure and lexical status, and on the idea that a syntactic structure must account for all types of pv’s, he suggests that pv’s offer an argument for the autonomy of syntax. Jackendoff argues against the standard approaches to pv structure summarised earlier, challenging the binary branching hypothesis implicit in all of them in favour of a flat VP. This possibility is bypassed in recent syntactic studies (but note the ternary analysis of resultatives in Carrier/Randall 1992), yet the failure of the pv research to agree even on the basic constituency of pv’s (i.e. on whether [NP Part] or [V Part] is a constituent) lends further weight to Jackendoff’s proposal.

Jaap van Marle, representing the morphological view of pv’s, focusses on structures of the type seen in (15). He queries the usual description of these verbs as defective, since the peculiarity of these verbs lies not in resisting inflection, but in resisting verb-second (15b,c). He argues that such structures are not structurally distinct from standard particle verbs with a prepositional particle, opening the way to a uniform morphological analysis for both. Restrictions on the acceptability in verb-second contexts is attributed to various syntactic and semantic factors. The explanations differ radically from previous accounts of this phenomenon, most of which note that defective complex verbs typically occur in derivational paradigms like the German one in (16), and, in various ways, derive the defectivity from the status of the constructions as backformations. For other approaches to defective complex verbs, see the studies cited by van Marle, and the German-based studies Stiebels/ Wunderlich (1994), McIntyre (2001b: A2.4), Zeller (1999: 51-53). Like van Marle, these authors emphasise the importance of such structures as a source of

(14) a. \[\text{[\text{door}]_P [x]_V}\] e.g. dooreten ‘eat on, continue eating’
   b. \[\text{[\text{op}]_P [x]_A}\] e.g. opfrissen ‘refresh’ (<friss ‘fresh’;
   ‘frissen ‘freshen’)

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Evidence about PV’s in Continental Germanic. Indeed, apart from their intrinsic interest for the theory of verb syntax, the constructions present a serious challenge to the attempt to define PV’s and to delineate them from neighbouring constructions.

(15) a. mastklimmen, pole-climb ‘climb the slippery pole’
   b. *zij mastklimt/ ?zij klimt mast
      ‘she climbs the slippery pole’
   c. ik geloof niet dat zij mastklimt
      ‘I don’t believe that she climbs the slippery pole’

(16) a. das Kettenrauchen ‘the chain smoking’ > kettenrauchen
      ‘chainsmoke’
   b. ?sie raucht Kette/*sie kettenraucht ‘she chainsmokes’

Bert Cappelle and Stefan Müller both make extensive use of data samples from real texts to enrich our understanding of certain relatively marked syntactic phenomena associated with particles. The corpus-based approach uncovers some new and surprising empirical generalisations which may be construed as supporting the reservations of Gries (this volume) about the reliability of empirical statements based only on native-speaker judgements. Cappelle deals with the phenomenon in (17a), particle preposing. He gives evidence that particle preposing does not follow exactly the same principles as the phenomenon of locative inversion, cf. (17b), an important point which challenges the common tendency to downplay the differences between PV’s and verb+PP structures. Contrary to prior consensus, it is shown that particle preposing is not confined to particles with a purely spatial meaning, and can occur with auxiliaries and in subordinate clauses. Cappelle also analyses the pragmatic aspects of the construction.

(17) a. Out went the lights. Down came the prices.
   b. Out of the house ran three children.

Müller analyses in detail cases like (18), where a German particle occupies the sentence-initial topicalisation position, normally seen as the prerogative of maximal projections. Müller adduces data indicating that particle topicalisation is far less restricted than hitherto thought. This result renders null and void the argument in earlier studies to the effect that restrictions on particle topicalisation bespeak a morphological status for particle verbs, and, incidentally, makes it likely that German particles are, or at least can be, maximal projections. Müller also analyses some other less well-known syntactic configurations in which particles occur, also using real data to reply to arguments presented for the morphological view of PV formation.

(18) Rein kommen wir schon
    in get we in.any.event
    ‘Getting in isn’t going to be the problem’

3. Approaches to particle semantics

Fewer articles in this book are concerned with the semantics of PV’s than with their structural aspects. This should not be taken as denying the value of the vast literature on particle semantics. Rather, it reflects the current balance of research activity. Also, we will see presently that the types of semantic effects of particles are apparently uniform throughout the Germanic languages, a fact which is interesting but which does not lend itself to the crosslinguistic comparison striven for in this book. Apart from providing a background to the contributions which do discuss PV semantics, the following paragraphs attempt to give readers an idea of the relevant phenomena and literature, with special emphasis on the question as to what semantic interpretations can be associated with PV’s, or, put differently, what semantic effects particles can have. Our answers are brief and informal; for more information, see Bolinger (1971); Dixon (1982); Fraser (1976); Lindner (1983); McIntyre (2001b,c); Olsen (1998b); Stiebl (1996); Zeller (2001), as well as the contribution by Jackendoff.

The following taxonomy of types of particle uses should not be seen as rigid. The classification is expository, and lays no claim to picking out natural classes.

A. Spatial particles. These typically expressing a direction (walk
through, pull a thread out, throw a ball down, nail a sign on) are frequent and transparent and provide the diachronic and, arguably, synchronic source of nonspatial particle meanings.

B. ‘Aspectual’ particles. These provide information about the lexical aspect or Aktionsart of the verbal event. One subclass lends to the verb a telic interpretation (chew up the meat, read the book through, German austrinken ‘drink up’, Dutch afmaken ‘finish [doing]’, Swedish dricka upp ‘drink up’). These are often obligatorily transitive and can transitivize verbs (think the problem through). Whether their aspectual effect is primary or results from some lexical meaning such as a decrernental one (use up) or a spatial one (fill up), is debatable (Stiebels 1996; McIntyre 2001c).

A second set of ‘aspectual’ particles is a natural class by virtue of its non-perfective (e.g. durative, ingressive, punctualising) semantics and its incompatibility with direct objects. This little-known phenomenon is discussed by Jackendoff (this volume), McIntyre (2001a,c), Stiebels (1996: 64f), Toivonen (2001: 144), Zeller (to appear). Germanic boasts at least a dozen such particle uses. Apart from the English examples below, we find the same argument blockage effects with some uses of Dutch door and Swedish pa (both glossable with English on in [19a]), German los (indicating the beginning of the verbal event), herum (around) and Swedish till and German zu (with a punctualising and/or intensifying effect).

(19) a. fight (*battles/enemies) on, eat (*salad) on  
   b. sing (*songs) along, read (*the text) along  
   c. type (*the essay) away, chew (*the food) away

C. Other non-spatial particles. This (merely expository) category is not meant to cover particles used in idiomatic pv’s; rather, we are interested in non-spatial, non-aspectual particle uses which appear to be (semi)productive. The possible particle meanings are legion, and the inability of such a particle use in one language to be translated into another is most likely not attributable to systematic differences between the languages. Let us give a few less familiar non-English examples. All are more productive than the few examples we have the space for indicate.

(20) a. Dutch af ‘for examination purposes’ (afdansen ‘to do a dancing exam’ and afrijden ‘to do one's driving exam’; cf. Booij, this volume)  
   b. German ein indicating that the direct object (often a reflexive coindexed with the subject) enters a state of readiness for the activity expressed by the verb (sich einsingen, self-in-sing 'warm up for singing', Schuhe einlaufen, shoes in-walk 'wear shoes in')  
   c. German an used for actions directed at someone: anstarren ‘stare at’, anlegen ‘lie to’, annotzen ‘whinge to’  
   d. German um expressing change or different repetition (umbauen '(re)build differently', umlernen ‘learn a new job’, umhängen ‘hang in a different position’)

One dimension by which these non-spatial, non-aspectual particles can be classified is that of whether the particle functions like a result predicate and can thus be part of telic VP’s. For instance, the particle in (20b) indicates a result state (‘readiness for an activity’), while the particle in (20c) does not. Or consider the two uses of off in (21), where the ‘castigatory’ sense in (a) is atelic, whence its compatibility with durative adverbials (for ten minutes), while the decrernental sense in (b) indicates the result ‘non-existence’, whence the telicity, evident through the compatibility with endpoint adverbials like in a short time.

(21) a. tell/slag/tick someone off  
   b. work off a debt, sleep off a sickness, exercise off three kilos

Cross-cutting the above rudimentary threefold particle taxonomy is the phenomenon of lexicalisation or idiomaticity, a problem mentioned at some point in most studies on pv’s, and a central focus in the essays by Jackendoff and McIntyre in this book. Innumerable pv’s do not seem to have the meaning one would expect from composition of the meanings of particle and verb. Many authors (e.g. Dixon 1982; Toivonen 2001; Zeller 2001) note that the idiosyncrasy is in some sense gradable. For instance, we have pv’s where neither constituent has any synchronous connection with the pv meaning. For
example, German *aufhören ‘cease’ glosses literally as ‘hear up’, and its existence can only be explained in diachronic terms. Then there are many pv’s where the semantics of one constituent is predictable. Thus, durative on (work on, eat on) occurs in rabbit on ‘talk on’, where the lexeme rabbit does not mean ‘talk’ elsewhere but the contribution of the particle is predictable. We even find the phenomenon with spatial particles. German eintrudeln ‘come in in dribs and drabs’ preserves the spatial meaning of ein ‘in’, but trudeln exhibits a meaning impossible with other directional expressions. Similar remarks pertain to skive off and slope off: for many speakers, one cannot skive/slope away.

Space constraints preclude a fuller discussion of the semantics of pv’s. In particular, we must put aside the issue of the argument-structural effects of particles. Readers interested in approaches to that issue which try to capture a representative set of the semantic classes of pv’s are directed to Stiebels (1996), McIntyre (2001c) and Zeller (to appear), and their references.

We now comment on the two contributions in the book substantially concerned with pv semantics. Jackendoff’s semantic classification of pv’s supplements the expository classification given above and the other classifications in the literature with little-known data and observations. For instance, Section 7 draws attention to structures in (22). These and some other constructions mentioned by Jackendoff complicate considerably the possibilities involved in describing pv’s. For one thing, we are not dealing with the verb+particle idioms of the sort usually talked about; rather, the particle and object is the locus of idiosyncrasy, leading Jackendoff to analyse them as lexically listed VPs with open slots for the verb. Secondly, the ordering of particle and object seen in (22) cannot be reversed, bringing up once again the issue of the definition of ‘particle’. (It is noteworthy that this lexicalisation of an idiom in a fixed particle-object sequence was also noted by Fraser 1976: 19 and Den Dikken 1995: 93, but only with individual idioms where verb, particle and object are fixed e.g. shut up shop vs. *shut shop up.)

(22) a. Harold sang/whistled/dreamt/jogged his heart out.
b. Richard ran/programmed/cooked/yelled his head/butt off.
c. Kelly wrote/slept/drew/edited up a storm.

Andrew McIntyre addresses the salient problem of idiosyncrasy in pv’s. Drawing on German and English data, he maintains that many particle verbs which appear idiosyncratic turn out to be compositional once one is aware of a representative set of structures with the particle in question. He tries to motivate independently the assumptions which make this position possible (e.g. the assumption that the subsenses of a lexical item can be idiosyncratically restricted to certain structural environments and the assumption of the nature of semiproductivity). He also replies to some studies (e.g. Wurmbrand 2000) which suggest differing syntactic structures for compositional and idiomatic particle verbs, since these studies would treat as idiosyncratic many of the structures which McIntyre argues to be compositional. Finally, he looks at uncontroversially non-compositional particle verbs, suggesting the empirical necessity of idiosyncratic rules guiding the interpretation of cases which are non-compositional but productively formed.

4. Approaches to the processing of particle verbs

Research on pv’s not only raises interesting theoretical questions but is also a challenge for empirical studies. For instance, experimental studies on pv’s have dealt with a number of issues, including the syntax of the constructions, the relationships between different classes of pv’s, the question as to their representational format (i.e. whether the particle and verb are stored separately or together), the issue of listedness and idiomaticity of pv’s and of the types of morphological, syntactic and semantic information in the lexical entry of a pv. See Frazier, D’Arcais and Coolen (1993), Marslen-Wilson et al. (1994), Taft and Forster (1975), Schreuder (1990), Zwitserlood et al. (1996), among others, for experimental studies. Many of these issues are interrelated. One of the major issues is the question of listedness and how closely it is connected to the assumed
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representational format of pv's. Forms of connections between representations in a mental lexicon seem to be detectable by use of a priming paradigm. Thus, it is believed that a priming effect is observed if a lexical item or information (the so called target) is recognized faster after perceiving a prime item. This facilitation of the recognition of a target item might reflect the relatedness of lexical items and is often discussed as a primary lexical organizational property (Drews and Zwitserlood 1995, Forster and Veres 1998). One of the most studied phenomena is the semantic transparency of pv's. It can be defined either based on the semantic value of the stem or on the whole complex form for pv constructions. Conflicting results exist on the investigation of semantic relatedness of opaque and transparent pv's (see Hillert, this volume). Marslen-Wilson et al. (1994) found no priming for opaque complex verbs, such as submit - PERMIT (words appearing in capital letters symbolize target words) which both have a bound stem. This finding seems to contradict earlier evidence provided by Taft and Forster (1975). By using non-words, these authors observed longer rejection times for bound stems (e.g. MIT, VIVE) than for non-stems (e.g. LISH in relish). Furthermore, Forster and Azuma (2000) claim that for semantic transparent items the meaning of the complex form is derived from the meaning of the parts. Hence, they have different stored representations than semantically non-derivable complex forms. Whether or not an item is semantically transparent determines in their view any test of morphological effects in lexical access. This issue will be further discussed by Lüdeling and de Jong in this volume.

In addition, pv's are of interest in psycholinguistic and corpus-based inquiries because they can occur separately in a sentence and yet have to be interpreted as one unit. This yields fascinating insights into both the structure of pv constructions and interpretive processing. Several contributions in this volume are concerned with processing of pv's from different perspectives.

Dieter Hillert and Farrell Ackerman study the classification of specific pv's in German, using a priming paradigm. A priming effect is observed if a lexical item or information (the so called target) is recognized faster after perceiving a prime item. Priming allows insights into the organization of entries in the mental lexicon. Moreover, lexical organizational properties seem to be reflected in the relatedness of individual lexical items. Hillert and Ackerman primarily investigate the semantic relatedness of opaque and transparent pv's at sentence level. For pv constructions transparency can be defined either based on the semantic value of the stem or of the whole complex form. The authors investigate this issue by manipulating the semantic contribution of the particle while keeping the stem constant (see also Lüdeling and de Jong, this volume, for similar linguistic material). Furthermore, they analyze the properties of pv's in Hungarian and German, suggesting further crosslinguistic experimental comparisons.

Anke Lüdeling and Nivja de Jong are also interested in the degree of semantic transparency in pv's. They test their view that German pv's have phrasal status in a word comprehension experiment and in an assessment of corpus and dictionary data. These authors test the effects of morphological familyhood by using semantically transparent and opaque pv's:

(23) a. stehen 'stand'
   b. dastehen 'stand there' transparent
   c. ausstehen 'be missing' opaque

These verb types should yield different reaction times if they are analyzed as semantically distinct units. That is, semantically transparent pv's should activate the morphological family the stem belongs to (dastehen – stehen). On the other hand, semantically opaque pv's should not access the morphological family of the stem. However, there should be no reaction time difference between opaque and transparent pv's if the comprehension system works primarily with morphological similarity. Several other experimental studies have explored how orthographic, morphological or semantic features can provide evidence about the lexical representation of pv's (Drews and Zwitserlood 1995; Rastle, Davis, Marslen-Wilson and Tyler 2000; Taft 1979).

Stefan Thomas Gries discusses what factors determine the choice of the particle position in English (take out the trash vs. take the
(trash out) in a corpus-based study. The frequency and types of constructions occurring in a corpus can reveal significant information about the factors that determine the position of the particle. Gries describes the circumstances under which one order is preferred over the other, isolating the determining factors. These values are computed by the application of monofactorial and multifactorial correlation coefficients for the continuous or discontinuous particle placement. His approach allows him to predict exactly the conditions under which particle and verb are preferred in a continuous or discontinuous position. Consequently, he provides interesting hypotheses about the processing efforts for deviant pv's.

Silke Urban explores temporal processing issues surrounding the occurrence of pv's in sentences. Discontinuous lexical items are challenging for sentence processing since they allow the exploration of the temporal availability of information types. The author asks whether the information connected with the verb is immediately used in the course of comprehension processing, and more specifically, whether particle information can interact with verbal argument structure. One of the main questions is that of which reflexes can be observed during the transitivisation of verbs: German lachen 'smile' is intransitive, while the pv anlachen 'smile at' is transitive. The processing of this transitivisation is observed as time-locked effects during the perception of a sentence since investigations are pursued using an online measurement (electroencephalography, EEG). The author gives an overview of experimental studies pursued on word and sentence level studies using pv's (e.g. Frazier et al 1993) and discusses and evaluates these investigations in line with the processing model for pv's provided by Schreuder (1990).

Several studies have shed some light on diverse aspects of pv's. We hope that the articles contributed to this volume address interesting problems related to the properties and processing of pv's serving to initialize other questions which need to be resolved by future research.