How syntax restricts the lexicon: particle verbs and internal arguments

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Abstract

Particles in German have the capacity to introduce new arguments when they combine with a verb. Based on this observation, I argue that the internal arguments of a particle verb are *always* introduced by the particle. I suggest that this follows from the fact that syntactically, the particle is the head of a maximal projection that occupies the single complement position of the verb; therefore, none of the base verb's arguments can be linked to a syntactic object position if a particle is present. In providing empirical evidence for my claim, I discuss in some detail the derivation of a variety of particle verbs, representing their semantics as Lexical Conceptual Structures, according to the framework developed in Jackendoff (1983, 1990).

1 Introduction

Many particles in German can introduce new arguments when they combine with a verb, deriving transitive or ditransitive particle verbs from intransitive base verbs. In this paper, I want to explore the following hypothesis which is based on this property of particles:

(1)   Internal arguments of a particle verb are always introduced by the particle.

(1) is to be understood as follows. Both the lexical entry of a verb and of a particle may include information about the linking of their conceptual arguments to syntax, but when the particle combines with the verb, only the linking information of the particle is relevant for the realization of internal syntactic arguments. The base verb no longer links any of its internal arguments to syntax.

In section 2, I discuss examples of particle verbs that provide straightforward evidence supporting the hypothesis in (1). I look at more controversial cases in

section 3, focusing on one particular element, the particle *ab*. I give a lexical representation for *ab*, and I show that a number of particle verbs with different linking properties can be derived from this single lexical entry. In section 4, I discuss (1) in the light of an analysis of "aspectual" particles, and in section 5, I offer an explanation for (1) which is based on a "phrasal" representation of particles and on syntactic conditions on argument structure realization.

2   The particle as a secondary predicate

Many prepositional particles extend the argument structure of the verb. For example, the transitive particle verbs *anlächeln*, 'smile at', in (2) and *abarbeiten*, 'work off', in (3) are derived from the intransitive base verbs *lächeln*, 'smile', and *arbeiten*, 'work', respectively:[1]

(2)   a.   *Peter lächelt* (**das Mädchen*)
                  Peter smiles (the girl)
         b.   *Peter lächelt das Mädchen an*
                  Peter smiles the girl   Prt
                  'Peter smiles at the girl'

(3)   a.   *Peter arbeitet* (**seine Schulden*)
                  Peter works (his debts)
         b.   *Peter arbeitet seine Schulden ab*
                  Peter works his debts   Prt
                  'Peter works off his debts'

The internal arguments of the transitive particle verbs in (2b) and (3b) are not part of the argument structure of the respective base verbs. Clearly, the particles *an* and *ab* in (2) and (3) must have contributed these arguments to the argument structure of the complex verbs by merging their lexical semantics with that of the base verbs. This merging can be analyzed in terms of complex predicate formation. For example, Stiebels (1996) assumes that the particle *an* in (2b) is a predicate that expresses (sets of) events which are "directed towards" a Goal-individual. If *an* is combined with a verb like *lächeln*, the resulting particle verb *anlächeln* expresses that the smiling-event denoted by the base verb is directed towards this Goal-individual, which is represented by the newly introduced direct object.

(4) and (5) illustrate the same point for particle verbs with two objects:

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[1] The examples that I provide in this paper all show the particle verb as it appears in main clauses. This means that the particle is always separated from the verb because the verb has moved to a sentence initial position (particles in German are called "separable prefixes" for this reason). The analysis that I present in section 5 explains the separability of particles but maintains the idea that the particle and the verb form a unit and can "combine" in a semantic sense.

(4) a. *Peter schwatzt (*mir/*ein Abonnement)*
    Peter chatters me/a subscription

  b. *Peter schwatzt mir ein Abonnement auf*
    Peter chatters me$_{dat}$ a subscription$_{acc}$ Prt
    'Peter talks me into taking up a subscription'

(5) a. *Peter hustet (*ihr/*eine dicke Erkältung)*
    Peter coughs her/ a thick cold

  b. *Peter hat ihr eine dicke Erkältung angehustet*
    Peter has her$_{dat}$ a thick cold$_{acc}$ Prt-coughed
    'She caught a strong cold from Peter's coughing'

The verbs *schwatzen*, 'chatter', in (4), and *husten*, 'cough', in (5) are intransitive. The derived particle verbs are double object verbs, but neither of the two objects is a possible argument of the base verbs. Again, the internal arguments of the particle verb have been introduced by *auf* and *an*, respectively.[2]
 Next, consider (6)-(8):

(6) a. *Peter schreibt einen Brief*
    Peter writes a letter

  b. *Peter schreibt das Finanzamt an*
    Peter writes the inland revenue office Prt
    'Peter writes to the inland revenue office'

  c. *Peter schreibt das Finanzamt (??mit einem Brief) an*
    Peter writes the inland revenue office (with a letter) Prt

(7) a. *Die Polizei sucht Beweisstücke*
    the police search pieces-of-evidence
    'The police are searching for pieces of evidence'

  b. *Die Polizei sucht das Feld ab*
    the police search the field Prt
    'The police scour the field'

  c. *Die Polizei sucht das Feld (nach Beweisstücken) ab*
    the police search the field (for pieces of evidence) Prt

(8) a. *Peter isst viel Kuchen*
    Peter eats lots of cake

  b. *Peter isst sich einen Bauch an*

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[2] The meaning of *an* in (5) is not the same as the meaning of *an* in (2). Stiebels (1996) argues that particles in German are ambiguous, sometimes having multiple meanings. However, although this is true at least for some of the instances of *ab* and *an* discussed in this section, many uses of particles which Stiebels characterizes through the formulation of separate lexical representations can in fact be related to one single semantic form. This will become clear in section 3.

        Peter eats Refl$_{dat}$ a stomach$_{acc}$ Prt
        'Peter eats (a lot of cake) such that he gets a stomach'
  c.   *Peter isst sich (?mit viel Kuchen) einen Bauch an*
        Peter eats Refl$_{dat}$ (with a lot of cake) a stomach$_{acc}$Prt

The transitive particle verb *anschreiben*, 'write to', in (6b) is derived from the base verb *schreiben*, 'write', which is transitive, (6a). However, the internal argument of the particle verb is the Goal-argument of the "directed towards"-event expressed by the particle. The original Theme-argument of *schreiben* (although conceptually still part of the interpretation) cannot be realized as the direct object anymore, and even its realization as an oblique phrase seems odd, cf. (6c). The linking information that is part of the base verb's lexical entry has been lost in the process of deriving the particle verb. In a similar fashion, the transitive (extensional) particle verb *absuchen*, 'scour', in (7b) is derived from the (intensional) verb *suchen*, 'search', and the particle *ab*.[3] Again, what is linked to the direct object position is the conceptual argument of the particle; the Theme of *suchen* can only be realized as an oblique phrase. Finally, in (8b), the particle *an* has been combined with the intransitive form of the transitive base verb *essen*, 'eat', deriving a ditransitive particle verb. The Theme-argument of *essen* can no longer be realized as the direct object.

    These examples suggest that there is no real difference between the linking properties of the base verbs in (2)-(5) and those of the base verbs in (6)-(8). The verbs to which the particles are added are syntactically intransitive in all cases; no conceptual argument of the base verbs is realized as the direct object of the particle verb. This implies that in all examples (2)-(8), the internal arguments of the derived particle verbs are introduced by the particle.

    The hypothesis that I explore in the following sections is that the data in (2)-(8) illustrate a characteristic of the argument structure of all particle verbs. According to this hypothesis, the internal arguments of particle verbs are *always* introduced by the particle; conceptual arguments of a base verb that do not correspond to conceptual arguments of the particle can *never* be realized as objects of a particle verb.

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[3] Notice again that the particle *ab* in (3) and the particle *ab* in (7) have different lexical meanings.

3   Particle verbs with the particle *ab*

3.1   The fusion of particle and verb

Compare the sentences in (9):

(9)   a.   *Peter spülte den Teller*
                   Peter washed the plate
         b.   *Peter spülte den Teller ab*
                   Peter washed the plate Prt
                   'Peter washed the plate'

The particle verb *abspülen* in (9b) is derived from the base verb *spülen*, 'wash, rinse'. Both verbs realize the same conceptual argument as their direct object. Therefore, (9) seems to provide evidence that the linking information specified by the base verb can be maintained in the derivation of the particle verb, contrary to the hypothesis which I proposed above.

However, I will show that this contradiction is only superficial. I will provide evidence that (9) is wholly compatible with the idea that the internal argument in (9b) is licensed only because the particle contributes the respective linking index.

Before I illustrate the derivation of the particle verb in (9), let me briefly introduce the semantic theory advocated in Jackendoff (1983, 1990). In Jackendoff's framework, the meaning of a lexical entry is given in its *Lexical Conceptual Structure* (LCS). Jackendoff assumes a basic repertoire of major conceptual categories, such as Event, Thing, Place, Path etc. These categories can be elaborated as function-argument structures that contain primitive semantic predicates such as CAUSE, GO etc. The arguments of these predicates are represented as variables in the LCS of a lexical entry. For example, (10) is the LCS of *drink*:

(10) $[_{Event}CAUSE\ ([_{Thing}\ ]^{\alpha}_{\mathbf{A}},\ [_{Event}GO\ ([_{Thing}LIQUID]_{<\mathbf{A}>},\ [_{Path}TO$
            $([_{Place}IN\ ([_{Thing}MOUTH\ OF([\alpha])])])])])]$
            (cf. Jackendoff 1990, 53)

(10) says that *drink* expresses a conceptual entity of the category "Event", which is specified as the "movement" of something into the mouth of someone. Furthermore, (10) represents the fact that the object of drink must be a liquid as a selectional restriction on the first argument of GO. In addition, Jackendoff represents the unity of two conceptual arguments through conceptual binding indices. The Greek letter α in (10) therefore specifies that in a drinking-event,

the liquid ends up in the mouth of the Agent (and not in somebody else's mouth, cf. the difference between *eat* and *feed*).

In Jackendoff's theory, theta-roles are defined as structural positions in a conceptual structure (see also Rappaport & Levin 1988; Pinker 1989). The Agent is the first argument of CAUSE; the Theme is the first argument of GO or BE; the Source is the first argument of FROM etc. The linking of these thematic roles to syntactic positions is stipulated as being part of the lexical entry of the verb. Jackendoff (1990) uses the subscript **A** to indicate argumenthood of a conceptual constituent; brackets around this subscript indicate optionality. The LCS of *drink* therefore specifies that this verb is transitive. It links the Agent to the subject position and the Theme (optionally) to the direct object position.

Let me now give the LCS for *spülen* in (9a). I represent this verb as an Event in which the Agent removes a Thing A (the Theme) from a Thing B (the Source) by putting liquid on B. Furthermore, (11) specifies a selectional restriction on the Source of *spülen*, i.e. that it has to be a dish or a dish-like Thing (henceforth I will sometimes omit self-evident category labels on the brackets):[4]

(11)   *spülen*:

$$\left[\begin{array}{l} \text{CAUSE ([ ]}^{\alpha}\text{}_{\mathbf{A}}\text{, [}_{\text{Event}}\text{ GO ([ ], [FROM ([DISH]}^{\beta}\text{}_{<\mathbf{A}>}\text{)])])} \\ \text{}_{\text{Event}}\text{ [BY [CAUSE ([}\alpha\text{], [GO ([LIQUID], [TO ([ON ([}\beta\text{])])])])]]} \end{array} \right]$$

The Agent of the Event expressed in (11) is linked to subject position. The Source is marked as an optional internal argument of the simple verb *spülen*, which accounts for (9a). Now consider (12):

(12)   a.   **Peter spülte das Fett*
                Peter washed the grease
         b.   *Peter spülte das Fett ab*
                Peter washed the grease Prt
                'Peter washed off the grease'

There is no linking index associated with the Theme in (11). Therefore, as (12a) shows, the Theme of the Event expressed by (11) is not a possible syntactic argument of the base verb. However, in (12b), where we again have the particle verb *abspülen*, the Theme of the *spülen*-Event in (11) is realized as the internal argument.

If we want to say that the particle *ab* in (9b) has no effect on the argument structure of the derived particle verb, then we have to assume that the particle verb in (12b) has been derived from a homophonous, but semantically different,

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[4] Alternatively, one can represent *spülen* as removing A from B by *putting B into a liquid*. Notice that (11) does not account for the particle verb (*den Mund*) *ausspülen*, 'wash out (the mouth)', whose direct object does not meet the selectional restriction on the Source given in (11). I leave these additional complications aside.

particle *ab*, since here the argument structure of verb has been modified by the particle. In fact, Stiebels (1996) proposes two different lexical representations for *ab* in order to account for an alternation similar to that exhibited in (9b) and (12b). However, it seems to me that postulating ambiguity of *ab* in (9) and (12) would be ignoring the obvious semantic relation between the two uses of *ab* in (9b) and (12b). Notice that in rinsing the plate (= (9)), it is the grease (Theme) that gets removed from the plate (Source); washing off the grease from wherever it is located (= (12)) implies that at the same time, the plate becomes clean. There is *one* particular relation between the Theme in (12) and the Source in (9), and I assume that the particle *ab* expresses exactly this relation. I propose the following LCS for *ab*:

(13)   *ab*: $[_{\text{Event}}\text{GO} ([_{\text{Thing}}]_{<\mathbf{A}>}, [_{\text{Path}} \text{FROM} ([_{\text{Thing}}]_{<\mathbf{A}>})])]$

(13) expresses an Event in which one Thing (the Theme) moves away from another Thing (the Source); the eventive character of (13) captures the directionality expressed by this particle (cf. Stiebels 1996). According to (13), the particle *ab* takes two arguments, and crucially, both arguments can become part of the LCS of a particle verb derived with *ab*. (9b) and (12b) hence show the same particle verb, but with different conceptual arguments linked to its syntactic object position.

    The derivation of particle verbs proceeds via unification of the LCS of the particle and the LCS of the verb (cf. Lieber & Baayen 1993 for a similar approach to Dutch verbal prefixes). Crucially, we can now continue to assume that, in accordance with the hypothesis in (1), the verb *spülen* does not contribute any of its linking indices to the LCS of the derived particle verb when it combines with (13). The result of LCS-unification of *ab* and the LCS in (11) is the LCS in (14):

(14)   *abspülen* (intransitive form of (11) + (13))

$$\left[\begin{array}{l} \text{CAUSE} ([\ \ ]^{\alpha}{}_{\mathbf{A}}, [_{\text{Event}} \text{GO} ([\ \ ]_{<\mathbf{A}>}, [\text{FROM} ([\text{DISH}]^{\beta}{}_{<\mathbf{A}>})])]) \\ {}_{\text{Event}} [\text{BY} [\text{CAUSE} ([\alpha], [\text{GO} ([\text{LIQUID}], [\text{TO} ([\text{ON} ([\beta])])])])]] \end{array} \right]$$

LCS-unification can combine two LCSs in different ways. (14) is an example of what I call "LCS-fusion" (in imitation of Jackendoff's (1990, 53) rule of "Argument Fusion"). The verb's LCS given in (11) includes a GO-component, with one conceptual argument "moving away" from another. This is exactly the relation expressed by the particle in (13). Therefore, the way in which the particle's LCS affects the derivation of the particle verb is not by modifying the LCS of the base verb, thereby adding a new semantic aspect (as was the case with the particles discussed in section 2; cf. e.g. the "directed towards"-meaning expressed by *an* in (2)). Rather, the particle's meaning is *fused* with the LCS of the verb. As a result, the LCS of the base verb and the LCS of the particle verb are

structurally identical. What the particle has added in (14) are the linking indices on the Theme and the Source.

Importantly, it is the accidental identity of the particle's LCS and the relevant component of the verb's conceptual structure which makes it look as if the particle verb's object in (9b) was the syntactic argument of the base verb. Conceptually, the particle and the verb contribute the same Source-argument, but what I suggest has happened in (9b) is that the linking index of the verb has been erased and then been re-introduced by the particle. The (internal) argument structure of the derived particle verb is therefore determined exclusively on the basis of the particle's linking indices. In contrast to the base verb, which had only one optional internal argument, the particle verb now takes two optional internal arguments, both introduced via the particle's LCS.

It is an important characteristic of (13) that both the Theme and the Source of the particle are marked as *optional* arguments. As a result, the particle verb in (14) can occur in four different syntactic frames. To summarize the discussion, let me look at these four options in turn. The first possibility yields (15):

(15)   Theme realized as syntactic argument:
         das Fett abspülen (= (12b))

In (15), the derived particle verb takes the Theme, but not the Source, as an argument and realizes it as its direct object. Crucially, this option is not available for the base verb; it is licensed with the particle verb only because the particle has added a new linking index.

If the second option is realized, we get (16):

(16)   Source realized as syntactic argument:
         den Teller abspülen (= (9b))

(16) is the option exhibited by (9b). As mentioned before, (9b) and (12b) show the same particle verb. The difference lies in the different choice that is made with respect to the conceptual argument realized as the direct object. Due to the possibility of both (15) and (16), the verb *abspülen* exhibits the alternation that researchers have labeled "Objektvertauschung", "Objektumsprung", or "landmark flexibility" (cf. e.g. Kühnhold 1973; Hundsnurscher 1986; McIntyre (2001)). It is unnecessary to postulate two different lexical entries to account for this alternation. The two occurrences of *abspülen* are no more different from each other than the two occurrences of a verb like *eat* in its intransitive and its transitive frame (*John ate for hours* vs. *John ate a piece of cake*).

The third option permitted by (14) derives (17):

(17)   Neither Theme nor Source realized as syntactic arguments:
         abspülen (= (18))

Since (14) specifies both the Theme and the Source as optional, they can both be omitted, in which case the particle verb *abspülen* is used intransitively:

(18)   *Peter spült ab*
             Peter washes Prt
             'Peter does the dishes'

Since (18) also leaves the conceptual Source-argument unexpressed in syntax, it is understood as Peter washing the *dishes*, due to the selectional restriction on the Source specified in (11)/(14).
             The last option would be something like (19a) or (19b):

(19)   Theme and Source realized as syntactic arguments:

         a.   *?*Peter spülte dem Teller das Fett ab*
                 Peter washed the plate$_{dat}$ the grease$_{acc}$ Prt
         b.   **Peter spülte dem Fett den Teller ab*
                 Peter washed the grease$_{dat}$ the plate$_{acc}$ Prt
                 'Peter washed the grease off the plate'

(19) shows that the fourth possibility cannot be realized; the particle verb *abspülen* is not a possible double object verb. But crucially, the examples in (19) can be excluded on independent grounds. The impossibility of (19b) follows from general conditions about the linking of thematic roles to syntactic positions. A number of authors, among them Carrier-Duncan (1985), Larson (1988), and Jackendoff (1990), have proposed a general argument hierarchy which ranks Themes higher than Goals and Sources. As a consequence, a verb that takes two internal arguments must link the Theme to the direct object position and the Source to the indirect object position. The ungrammaticality of (19b) therefore follows from the violation of this linking principle.
    The fact that the Source cannot be realized as a dative object follows from general restrictions on the semantics of datives. As noted by Pinker (1989) and many others, Goal- and Source-datives are restricted to persons or at least to animate Things. The problem is that the selectional restriction on the Source of *spülen* excludes persons as Sources. However, if we substitute the German verb *waschen*, 'wash', for *spülen*, we find that examples like (20) are perfectly acceptable:

(20)   a.   *Der Arzt wäscht dem Verletzten das Blut ab*
                 The doctor washes the injured$_{dat}$ the blood$_{acc}$ Prt
                 'The doctor washes the blood off the injured people'
         b.   *Der Anstreicher wäscht sich die Farbe ab*
                 the painter   washes Refl$_{dat}$ the paint$_{acc}$ Prt
                 'The painter washes the paint off himself'

Since *waschen* allows for animate Sources, the fourth possibility (both arguments of *ab* occur as syntactic objects) can also be realized (notice that the other three options are also licensed with *abwaschen*). The difference between the bad example (19b) and the good examples in (20) basically reduces to this lexical-conceptual difference between the verbs *spülen* and *waschen* with respect to their Source-arguments.

   This discussion shows therefore that the properties of the particle verb in (9b) are compatible with the hypothesis in (1) - the index of the base verb that links a conceptual argument to the direct object position is irrelevant for the argument structure of the particle verb. In the following I will provide more evidence that "internal" linking indices of a base verb must be removed before the verb combines with a particle.

3.2   Change of possession

The simple verb *spülen* discussed in section 3.1 takes an *optional* direct object. Consider next a verb that is classified as *obligatorily* transitive: the verb *kaufen*, 'buy':

(21)   a.   *Peter kaufte die Karten*
                   Peter bought the tickets
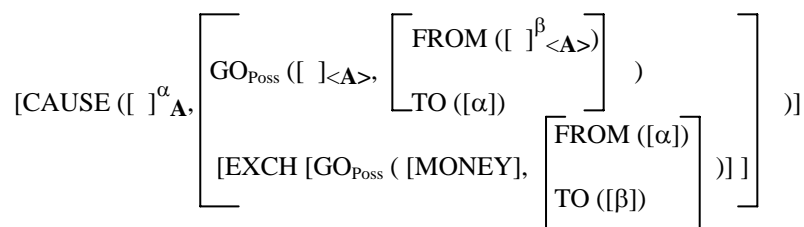   b.   *?*Peter kaufte*
                   Peter bought

The LCS of *kaufen* is given in (22):

(22)   *kaufen*   (cf. Jackendoff 1990, 193)

$$[\text{CAUSE } ([\ ]^{\alpha}_{\mathbf{A}}, \begin{bmatrix} \text{GO}_{\text{Poss}} ([\ ]_{\mathbf{A}}, \begin{bmatrix} \text{FROM } ([\ ]^{\beta}) \\ \text{TO } ([\alpha]) \end{bmatrix}) \\ [\text{EXCH } [\text{GO}_{\text{Poss}} ([\text{MONEY}], \begin{bmatrix} \text{FROM } ([\alpha]) \\ \text{TO } ([\beta]) \end{bmatrix})]] \end{bmatrix})]$$

(23) is the result of combining the LCS of *kaufen* in (22) with the LCS of the particle *ab* which was given in (13) above:

(23)   *abkaufen*   ((22) + (13))

$$[\text{CAUSE} ([\ \ ]^{\alpha}{}_{\mathbf{A}}, \begin{bmatrix} \text{GO}_{\text{Poss}} ([\ \ ]_{<\mathbf{A}>}, \begin{bmatrix} \text{FROM} ([\ \ ]^{\beta}{}_{<\mathbf{A}>}) \\ \text{TO} ([\alpha]) \end{bmatrix}) \\ [\text{EXCH} [\text{GO}_{\text{Poss}} (\ [\text{MONEY}], \begin{bmatrix} \text{FROM} ([\alpha]) \\ \text{TO} ([\beta]) \end{bmatrix})]\ ] \end{bmatrix})]$$

As in the case of *spülen,* 'rinse', the LCS of *kaufen* includes a GO-FROM-component which indicates change of possession, due to the Poss-subscript on GO. The entries (22) and (13) can combine via LCS-fusion after the lexical index on the Theme of (22) has been removed, with the possessive specification on the GO-predicate of (22) being maintained in this process. The particle verb now marks the Theme and the Source as optional arguments, and consequently, the same four linking possibilities that were realized with *abspülen* should arise. However, *abkaufen* does not behave as expected:

(24)   a.   *Peter kaufte die Karten ab*   (Theme = direct object)
                   Peter bought the tickets$_{\text{acc}}$ Prt
         b.   *Peter kaufte ihn ab*   (Source = direct object)
                   Peter bought him$_{\text{acc}}$ Prt
         c.   *Peter kaufte ab*   (intransitive use)
                   Peter bought Prt
         d.   *Peter kaufte ihm die Karten ab*   (Theme = direct
                   Peter bought him$_{\text{dat}}$ the tickets$_{\text{acc}}$ Prt   object; Source =
                   'Peter bought the tickets from him'   indirect object)

(24) shows that the particle verb *abkaufen* is a double object verb; it has to realize two conceptual arguments as objects. It is impossible to omit either the Source or the Theme, or both. The brackets around both **A**-indices in (23), inherited from the particle's LCS, therefore do not seem to capture the actual linking properties of the verb *abkaufen*.

   The fact that the Theme of the particle verb *abkaufen* cannot be omitted challenges the hypothesis that the verb's linking properties are irrelevant for the realization of internal arguments of particle verbs. If the Theme of *abkaufen* is introduced by *ab*, we expect it to be optional; the fact that it is obligatory seems to suggest that the linking index on the Theme of the obligatorily transitive base verb *kaufen* has been preserved. However, notice first that this assumption still does not account for the ungrammaticality of (24a), where the Theme *is* realized. Moreover, the following example shows that the linking properties of a

base verb have nothing to do with the obligatory double object frame of a verb like *abkaufen*:

(25)   *Peter schwatzt* (*mich/*das Buch*)
                        Peter chatters   (me/the book)

The verb *schwatzen*, 'chatter', is intransitive, and if we add the particle *ab*, the derived particle verb should license four syntactic frames. However, (26) illustrates that *abschwatzen*, like *abkaufen*, can only be used as a double object construction:

(26)   a.   *Peter schwatzt das Buch ab*   (Theme = direct object)
              Peter chatters   the book$_{acc}$ Prt
        b.   *Peter schwatzt mich ab*   (Source = direct object)
              Peter chatters me$_{acc}$ Prt
        c.   *Peter schwatzt ab*   (intransitive use)
              Peter chatters Prt
        d.   *Peter schwatzt mir das Buch ab*   (Theme = direct
              Peter chatters me$_{dat}$ the book$_{acc}$ Prt   object; Source
              'Peter talks me into giving him the book'   = indirect object)

The LCS of *ab* is added to the meaning of *schwatzen*, 'chatter', and the particle verb *abschwatzen* expresses that something (e.g. a book) changes possession as a result of somebody (Peter) talking to someone (me). However, the only possible version is (26d); both Thing-arguments introduced by the particle must be realized as syntactic objects. In the light of examples like (26), the obligatoriness of the direct object of *kaufen*, 'buy', is not a plausible explanation for the ditransitivity of the derived particle verb.

   I therefore suspect that there are independent conditions that single out (24d) and (26d) as the only possible argument structure realizations of the particle verbs *abkaufen* and *abschwatzen*. Notice that, due to the LCS of the base verb, the GO-component of *abkaufen* is specified as possessive. The verb expresses that the Theme changes ownership from the Source to the Goal (which is conceptually bound to the Agent). Interestingly, change of possession is also implied in (26d); the book changes possession as a result of Peter's "sweet-talking". Since neither *ab* nor *schwatzen* contribute the possessive interpretation of GO, this aspect must have been added in the lexical process of combining the base verb and the particle (the non-compositional nature of this process is discussed in section 5).[5]

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[5] The fact that the GO-component of *ab* is interpreted as expressing possession when combined with a verb like *schwatzen* is not surprising. If the LCS of the particle *ab* is added to an intransitive verb, as is the case in the derivation of *abschwatzen* in (26d), then the event expressed by the base verb must be taken to be characteristic of the GO-transfer expressed by *ab*. The most plausible (if

I suggest that it is this change-of-possession component that is responsible for the obligatoriness of both internal arguments of *abkaufen* and *abschwatzen* (notice that the same holds for the examples (4b), (5b) and (8b) in section 1, which are also obligatorily ditransitive). The relation between verbs of possession and ditransitivity has been noted on numerous occasions in the literature (cf. Oehrle 1976; Herslund 1986; Pinker 1989; Jackendoff 1990; among many others). I assume that something like the following condition is responsible for the argument structure of *abkaufen* and *abschwatzen*:

(27)   If a relation between two conceptual arguments is possessive, and if both arguments are provided with linking indices, both arguments must *obligatorily* be linked to object positions.

Both *abkaufen* and *abschwatzen* mark the Theme and the Source as arguments; both linking indices are contributed by the particle. Since both verbs are verbs of possession, (27) requires the obligatory realization of both arguments in the syntax.

Notice that the LCS of *kaufen*, 'buy', only marks the Theme as an argument, not the Source (cf. (22)). Therefore, (27) is not violated by the fact that *kaufen* is not a double object verb, although it is a verb of change-of-possession. The Source can only be realized as an oblique phrase, (28a). If *kaufen* appears with an additional dative object, this object is interpreted as the Goal of the event (the *dativus commodi*), (28b):

(28)   a.   *Peter kaufte die Karten von Peter*
               Peter bought the tickets$_{acc}$ from Peter
        b.   *Peter kaufte ihm   die Karten*   (Indirect object = <u>Goal</u>)
               Peter bought him$_{dat}$ the tickets$_{acc}$
               'Peter bought the tickets <u>for</u> him'

Crucially, it is only through the particle *ab* that the Source of the LCS of *abkaufen* is linked to syntax. Consequently, two conceptual arguments of a possessive verb are marked as arguments, and the condition in (27) makes it obligatorily ditransitive

Stiebels (1996) explains (24) and (26) by postulating another lexical entry for *ab* which is different from the two entries she uses to account for the alternation between (9b) and (12b). According to her proposal, *ab* in (24) and (26) expresses the dissolution of a possessive relation formerly holding between two arguments. Therefore, the "possessive" particle *ab* takes two arguments, and consequently, particle verbs derived from this entry are ditransitive. Notice that the intuition behind Stiebels' proposal is similar to the one behind my suggestion: ditransitive particle verbs with *ab* always express change of possession.

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not the only possible) way is to interpret the transfer in an abstract sense, i.e. as a change of possession.

However, whereas Stiebels' analysis is bought at the cost of an additional lexical entry, my proposal relates the similarities of the LCSs of ditransitive verbs like *abschwatzen* and *abkaufen* on the one hand and particle verbs like *abwaschen* and *abspülen* on the other to one single LCS of the particle *ab*.

3.3   Ditransitive base verbs

In this section, I look at base verbs with more than one obligatory internal argument:

(29)   a.   *Peter stellte die Bücher *(auf das Regal)*
                  Peter put   the books   on the shelf
         b.   *Peter stellte *(den Topf) auf den Tisch*
                  Peter put   the pot   on the table

(30)   a.   *Peter gibt Maria *(den Schlüssel)*
                  Peter gives Mary$_{dat}$ the keys$_{acc}$
         b.   *Peter gibt *(seiner Frau) den Brief*
                  Peter gives his wife$_{dat}$ the letter$_{acc}$

The verb *stellen*, 'put', requires a direct object-DP and a PP. Both syntactic phrases are obligatory. The verb *geben*, 'give', is a double-object-verb. (31) and (32) give the relevant LCS-entries:[6]

(31)   *stellen*:

$$[_{Event} CAUSE ([_{Thing}]_A, [_{Event} GO \quad ([_{Thing}]_A, \begin{bmatrix} FROM ([\quad]) \\ TO ([_{Place} \quad]) \end{bmatrix})])]$$

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[6] In contrast to (31), Jackendoff's (1990, 80) representation of *put* does not include a FROM-component. I have included this aspect in the LCS of *stellen* because of examples like (i):

(i) Peter stellt den Topf vom Herd (auf den Tisch)
     Peter puts   the pot   from the stove (on the table)

It seems that in German, the PP-complement of stellen (and also of laden, 'load'; see below) may optionally realize the argument of FROM or of TO (even both arguments can appear together). This raises interesting questions concerning the form in which linking information is stored in a verb's lexical entry. The possibility of realizing either the Source or the Goal as an obligatory PP-argument may make an approach look more tenable that establishes linking via subcategorization. For reasons of space, I cannot explore this alternative here, but see the debate between Emonds (1991) and Jackendoff (1993).

(32)   *geben*:   (Jackendoff 1990, 135)

$$[_{Event} \text{CAUSE} ([_{Thing} \ ]^{\alpha}{}_{\mathbf{A}}, [_{Event} \text{GO}_{Poss} ([_{Thing} \ ]_{\mathbf{A}}, \begin{bmatrix} \text{FROM} ([\alpha]) \\ \text{TO} ([\ \ ]) \end{bmatrix})])]$$

The basic differences between (31) and (32) are that (i) the GO-component of *geben* is specified as being possessive, and (ii) the Goal of *stellen* must be of the category Place. These two differences are responsible for different syntactic properties: *geben* includes a GO$_{Poss}$-predicate and takes two arguments; the obligatoriness of the dative object therefore follows directly from the condition stated in (27). The Goal of *stellen* is of the category Place; it cannot be realized by a person. According to the conceptual restrictions on datives discussed in section 3, *stellen* cannot take a dative object and must realize the Goal with an obligatory PP.

    Combining the particle *ab* with the lexical entries in (31) and (32) yields the particle verbs in (33) and (34):

(33)   *abstellen*:

$$[_{Event} \text{CAUSE} ([_{Thing} \ ]^{\alpha}{}_{\mathbf{A}}, [_{Event} \text{GO} ([_{Thing} \ ]_{<\mathbf{A}>}, \begin{bmatrix} \text{FROM} ([\alpha])_{<\mathbf{A}>} \\ \text{TO} ([_{Place} \ ]) \end{bmatrix})])]$$

(34)   *abgeben*:

$$[_{Event} \text{CAUSE} ([_{Thing} \ ]^{\alpha}{}_{\mathbf{A}}, [_{Event} \text{GO}_{Poss} ([_{Thing} \ ]_{<\mathbf{A}>}, \begin{bmatrix} \text{FROM} ([\alpha])_{<\mathbf{A}>} \\ \text{TO} ([\ \ ]) \end{bmatrix})])]$$

Notice first that the LCS of g*eben*, 'give', in (32) and, accordingly, the LCS of *abgeben* in (34) both include a conceptual binding index that links the Agent of the Event to the Source of the transfer. Interestingly, this interpretation is also part of the meaning of the derived verb *abstellen*, although no such index is present in the LCS of the base verb *stellen*, 'put'. Whereas *stellen* can imply that something is moved from some place to another (i.e. from the stove onto the table), *abstellen* can only mean that the Agent puts down something that s/he holds in her/his hands or carries around. Crucially, *den Topf abstellen*, 'put down the pot', cannot mean that one takes the pot away from the stove. The interpretation of this verb is more that the pot is in some way with, or at, the Agent before s/he puts it down. As was the case with the possessive interpretation of GO

added in the process of combining the particle *ab* and the verb *schwatzen*, 'chatter', the conceptual binding index included in the LCS of *abstellen* is an additional aspect of the meaning of this verb that is not contributed by one of its parts. Therefore, although the LCS of *abstellen* is clearly based on the LCS of the verb *stellen* and the LCS of the particle *ab*, this particle verb cannot be analyzed as being derived fully compositionally. (I will address this point in section 5.)

Both *abstellen* and *abgeben* specify the Theme and the Source as optional arguments. But of the four possibilities of realizing these arguments, only one is allowed:[7]

(35)   a.   *Peter stellte den Topf ab*   (Theme = direct object)
                    Peter put   the pot Prt
                    'Peter put down the pot'
          b.   **Peter stellte den Herd ab*   (Source = direct object)
                    Peter put   the stove Prt
                    (ungrammatical under the intended reading:
                    Peter takes sth. from the stove)
          c.   **Peter stellte ab*   (intransitive use)
                    Peter put Prt
          d.   **Peter stellte dem Herd den Topf ab*   (Theme = direct
                    Peter put   the stove$_{dat}$ the pot$_{acc}$ Prt   object; Source =
                    'Peter took the pot from the stove'   indirect object)

(36)   a.   *Peter gibt den Schlüssel ab*   (Theme = direct object)
                    Peter gives the keys   Prt
                    'Peter hands over the keys'
          b.   **Peter gibt sich ab*   (Source = direct object)
                    Peter gives Refl$_{acc}$ Prt
          c.   **Peter gibt ab*   (intransitive use)
                    Peter gives Prt
          d.   **Peter gibt sich den Schlüssel ab*   (Theme = direct object;
                    Peter gives Refl$_{dat}$ the keys$_{acc}$ Prt   Source = indirect object)

The data in (35) and (36) show that the only possible syntactic frame in which the two particle verbs can appear is the transitive one, with the Theme as the direct object. Ignoring the ungrammatical syntactic frames in (35b-d) and (36b-d) for the moment, it is clear that (35a) and (36a) support the hypothesis that the linking index of a base verb does not enter the derivation of a particle verb. In both (31) (*stellen*) and (32) (*geben*), there is an **A**-index on the conceptual Goal-argument, making its realization in syntax obligatory. The derived particle verbs,

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[7] I ignore the intransitive use of *abgeben* here, because this is only possible with a specialized interpretation of the implicit argument, as in e.g. *Er hat abgegeben*, 'He has submitted his thesis' (cf. Jacobs 1994).

however, no longer take obligatory Goal arguments; the original Goal-PP of *stellen* and the original possessor dative of *geben* are odd when they occur with the respective particle verbs:

(37)   ?**Peter stellte die Bücher auf das Regal ab*
                  Peter put   the books   onto the shelf Prt
(38)   **Peter gibt Maria die Schlüssel ab*
                  Peter gives Mary the keys   Prt

The examples in (37) and (38) show that the linking information of the base verbs is not carried over to the linking properties of the derived verbs. One might object that (37) is ill-formed because the particle *ab* has in fact *saturated* the Goal-argument of the verb *stellen* in (35a). However, notice that this view (articulated in e.g. Stiebels & Wunderlich (1994), Stiebels (1996), and Olsen (1996, 1997a)) fails to explain how the particle can saturate not only the Place-argument of *stellen* (normally represented by a PP), but also the Thing-argument of *geben* (normally realized by a DP). However, both (35a) and (36a) follow from the assumption that the derivation of particle verbs like *abstellen* or *abgeben* proceeds in the same fashion as the derivation of the particle verbs discussed in sections 3.1 and 3.2. The indices that link conceptual arguments of the base verb to internal argument positions are removed; the internal arguments of the particle verb are then introduced by the particle *ab*.

But now let me turn to the problematic examples in (35b-d) and (36b-d), whose ungrammaticality is unexpected, given the linking properties of the particle *ab* that carry over to the verbs *abstellen* and *abgeben* in (33) and (34). With *abgeben*, there is an additional problem: since the particle verb includes a GO $_{Poss}$-predicate and optionally links two arguments to syntax, it should be a double object verb, according to condition (27). So why is it not possible to realize the Sources of these particle verbs as objects?

One might suspect that the conceptual binding indices that link the Source-arguments in (33) and (34) to the Agents of the Events have something to do with this impossibility. Obviously, these indices require the Source to be the same entity as the Agent, which immediately excludes (35b,d). However, we would still expect that the Source can be realized by a reflexive element which is bound by the subject-DP. For example, the LCS of *kaufen*, "buy", links the Agent to the Goal via conceptual binding (cf. (22) in section 3.2), and therefore, the Goal-argument can be realized by an anaphor:

(39)   *Peter kaufte <u>sich</u> eine neue Jacke*
          Peter bought Refl$_{dat}$ a new jacket$_{acc}$
          'Peter bought himself a new jacket'

But unfortunately, this option does not exist for the Source of *abgeben*; (36b,d) are still ungrammatical.

I have no formal proposal that explains why *abgeben* and *abstellen* can only occur in the transitive frame. It may well be, however, that there is no such explanation - it may just be an idiosyncratic property of both verbs that of the four possible syntactic frames, only one can in fact be realized. If this is true, then we arrive at the conclusion that although the underlying structure of many particle verbs can be related to a well-defined LCS of a particle and a particular LCS of a verb, the LCS of the particle verb may include particularities that *cannot* be related to its parts. In the case of *abstellen* and *abgeben*, these idiosyncrasies concern the argument structure of the derived particle verb. A compositional analysis may predict the *possible* linking properties of the derived verb, but its *actual* linking properties have to be learned specifically for the lexical item.

The fact that the actual linking properties of a particle verb are in some cases idiosyncratically determined can be illustrated by yet another example. Compare *abstellen* with the particle verb *abladen*, derived from the base verb *laden*, 'load'". Like *stellen*, 'put', *laden* takes an obligatory PP-argument that realizes the Goal of the loading, (40a).[8] Like *abstellen*, the particle verb *abladen* can represent the Theme of the Event as a direct object, (40b). However, in contrast to *abstellen*, *abladen* allows the Source to appear as the direct object, (40c):

(40)   a.   *Peter   lädt   die Koffer *(auf den Gepäckwagen)*
                      Peter loads the suitcases onto the luggage-cart
          b.   *Peter   lädt   die Koffer   ab*
                      Peter loads the suitcases Prt
                      'Peter loads the suitcases down'
          c.   *Peter lädt den Gepäckwagen ab*
                      Peter loads the luggage-cart Prt
                      'Peter unloads the luggage-cart'

In contrast to (35b) above, (40c) is perfectly acceptable. Although the argument structures of the base verbs *laden* and *stellen* do not differ significantly, the linking properties of the two particle verbs *abstellen* and *abladen* are different. Therefore, this difference must be lexically encoded in the entries of these two particle verbs; it cannot be related to the meaning of their parts.[9]

(40) shows that the particle verb *abladen*, like the particle verb *abspülen* discussed in section 3.1, exhibits landmark flexibility. The fact that landmark flexibility occurs with particle verbs derived from both (optionally) transitive base verbs and ditransitive base verbs strongly supports the hypothesis that the linking information of the base verb is in fact irrelevant when it comes to determin-

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[8] Like *stellen*, *laden* can also realize the Source with a PP (cf. note 6):
(i)   Peter   lädt   die Koffer vom Gepäckwagen
         Peter loads the suitcases off the luggage-cart
[9] Notice that, in contrast to *abstellen*, the Source of the LCS of abladen is not conceptually bound to the Agent. Again, this raises the suspicion that the ungrammaticality of (35b,d) and (36b,d) has something to do with the conceptual binding index on the Source-arguments of *abstellen* and *abgeben*.

ing which of the particle verb's internal arguments is linked to syntax. Furthermore, (40b) provides additional evidence contradicting the view that particles can saturate arguments of their base verbs. If it was assumed that the particle *ab* saturates the argument of the verb *laden* that is otherwise saturated by a PP-argument (as in (40a)), it would be entirely impossible to account for (40c) on the assumption that we are dealing with the same particle *ab*. In contrast, my analysis not only explains the alternation in (40), but also the derivation of the particle verbs discussed above, on the basis of one single LCS for the particle *ab*.

4   Aspectual particles

Certain particles contribute an aspectual reading to the event expressed by the base verb. If the base verb is transitive, it sometimes seems as if its argument-linking properties were maintained in the derivation of the particle verb. In this section I will provide evidence that challenges this assumption.

Consider (41b) as a first example of a particle verb that looks like an aspectual variant of the transitive base verb:

(41) a.   *Peter trinkt sein Bier*
              Peter drinks his beer
              'Peter is drinking his beer'
      b.   *Peter trinkt sein Bier aus*
              Peter drinks his beer Prt
              'Peter drinks up his beer'

The particle verb *austrinken*, 'drink up', expresses the termination of the event denoted by the base verb. It looks as if the particle *aus* in (41) was an aspectual operator that takes the whole VP in its scope, including the base verb's internal argument. However, I propose an alternative analysis, starting from a lexical entry for *aus* which is given in (42) (cf. Hundsnurscher 1968; McIntyre 2001):

(42)   *aus*: $[_{Event}GO\ ([_{Thing}\ ]_{<A>},\ [_{Path}FROM\ ([_{Place}IN\ ([_{Thing}\ ]_{<A>})])])]$

The LCS of *aus* is similar to the LCS of *ab*. The difference between these two particles is that *aus* is more specific about the Source of the GO-event: it must be a Place within some other Thing-argument, and it is this Thing-argument that is optionally linked to syntax (in the following, I will refer to this argument as the "Container"). Now consider what happens if the LCS in (42) unifies with the LCS of *trinken*, 'drink', given in (10) above and repeated in (43) for convenience:

(43)   *trinken*:

$$[_{Event}\text{CAUSE} ([_{Thing}\ ]^{\alpha}{}_{\textbf{A}}, [_{Event}\text{GO} ([_{Thing}\text{LIQUID}]_{<\textbf{A}>}, [_{Path}\text{TO}$$
$$([_{Place}\text{IN}([_{Thing}\text{MOUTH OF}([\alpha])])])])])]$$ (cf. Jackendoff 1990, 53)

(44)   *austrinken*:
$$[_{Event}\text{CAUSE} ([_{Thing}\ ]^{\alpha}{}_{\textbf{A}}, [_{Event}\text{GO}$$

$$([_{Thing}\text{LIQUID}]_{<\textbf{A}>}, \begin{bmatrix} \text{FROM} ([_{Place}\text{IN}([_{Thing}\ ]_{<\textbf{A}>})]) \\ \\ \text{TO} ([_{Place}\text{IN} ([_{Thing}\text{MOUTH OF}([\alpha])])]) \end{bmatrix}_{\text{Path}})])]$$

In (44), we have partial LCS-fusion. The GO-component of *trinken*, 'drink',
takes a Goal as second argument, whereas the GO of *aus* specifies the Con-
tainer. Therefore, the two Themes of both GO-predicates fuse, but the FROM-
component of the particle is added to the verb. As follows from (42), the result-
ing particle verb has two optional syntactic arguments, both introduced by *aus*.
Notice that the Source in (44) must be a Container and cannot be a person. This
restriction excludes the double-object frame, which would realize the Source in
the dative. The remaining three possible syntactic frames in which *austrinken*
can appear are illustrated in (45):

(45)   a.   *Peter trinkt sein Bier aus*   (Theme = direct object)
              Peter drinks his beer Prt
              'Peter drinks up his beer'
        b.   *Peter trinkt sein Glas aus*   (Container = direct object)
              Peter drinks his glass Prt
              'Peter empties his glass'
        c.   *Peter trinkt aus*   (no direct object)
              Peter drinks Prt
              'Peter finishes drinking'

In (45b), the Container-argument of IN is linked to syntax. In contrast, the base
verb *trinken*, 'drink', cannot realize the Container as an object, simply because it
is not part of its LCS:

(46)   **Peter trinkt sein Glas*
                       Peter drinks his glass
                       intended reading: 'Peter drinks from his glass'

An analysis of *aus* as an aspectual operator with scope over the whole VP
clearly does not work for (45b) in the light of the ungrammaticality of (46).
Rather, what (45) shows is that *austrinken* has been derived by combining the
(intransitive) base verb *trinken* with the LCS of *aus* in (42), and the particle verb

has inherited the linking indices of the particle. Consequently, *austrinken* exhibits landmark flexibility.

The claim that the derivation of *austrinken* follows the same pattern as the derivation of the particle verbs discussed in section 3 is further supported by an example like (47), where *aus* combines with a ditransitive verb:

(47)   a.   *Peter schüttet das Wasser aus dem Eimer*
            Peter pours   the water out of the bucket
       b.   *Peter schüttet das Wasser aus*
            Peter pours   the water Prt
            'Peter pours out the water'
       c.   *Peter schüttet den Eimer aus*
            Peter pours   the bucket Prt
            'Peter empties the bucket'

The simple verb *schütten*, 'pour', can only occur in the ditransitive frame in (47a); neither the direct object nor the PP can be omitted. In (47b,c), *schütten* has been combined with the particle *aus*. The resulting particle verb *ausschütten*, 'pour out', exhibits landmark flexibility and can realize both the Theme and the Container, as expected. It hence patterns with the derivation of the particle verb *abladen*, 'load down', discussed in the previous section. Again, an analysis of the particle *aus*, according to which *aus* takes scope over the base verb plus its arguments, fails for (47) since here, *aus* clearly changes the argument structure of the verb.

But what about the termination- or completion aspect of *austrinken* in (41b/45a)? This aspect can easily be incorporated into the LCS of (44), simply by adding the respective conceptual feature to the GO- or the FROM-predicate (cf. Jackendoff 1990 for an account of completiveness in terms of the feature [± distributive]). This feature may be taken as being introduced by the particle or as being a particular lexicalized aspect of the meaning of *austrinken* that is added in the course of the derivation (as was also argued above to be the case with idiosyncratic aspects of other particle verb meanings). One might also follow McIntyre (2001) and argue that the aspectual interpretation of particle verbs like *austrinken* is the result of the Container being promoted to direct object position. At first sight, this assumption seems problematic, since the example in (41b)/(45a) has the Theme as direct object, but it also has a terminative interpretation. However, notice that there is an interesting difference between the interpretation of the DP *sein Bier*, 'his beer', in (41a), where it occurs as the direct object of the simple verb *trinken*, and the same DP in (41b), where it is the direct object of *austrinken*: In (41b), but not in (41a), this DP can also be interpreted as a Container. Notice that nominals like *beer* and *coffee* can also refer to a cup of coffee or a glass or a bottle of beer. This is why the nouns *beer* and *coffee* can combine with numeral expressions, an option which usually is not available for mass nouns:

(48)   a.   *John had three glasses of beer → John had three beers*
         b.   *John ordered one cup of coffee → John ordered one coffee*

Like the DPs in (48), the DP *sein Bier* has the capacity to refer to a Container. Since the verb *austrinken* can take both a Theme and a Container as its direct object, a sentence like (41b)/(45a) is ambiguous: The DP *sein Bier* may refer to the liquid (the Theme of the drinking), but also to the Container (i.e. (41b)/(45a) can mean that Peter empties his glass or bottle of beer). In fact, both interpretations might be available at the same time, thereby causing the construction to receive a strong terminative interpretation. Notice that no such ambiguity arises with the direct object of (41a), since *trinken* does not select Containers as direct objects.

    Certain lexicalized particle verbs with *aus* have developed a metaphorical meaning:

(49)   a.   *Peter hat das Buch gelesen*
                 Peter has the book read
                 'Peter read the book'
         b.   *Peter hat das Buch ausgelesen*
                 Peter has the book Prt-read
                 'Peter has finished reading the book'
         c.   *Peter hat das Buch zu Ende gelesen*
                 Peter has the book to   end   read
                 'Peter has finished reading the book'

The literal meaning of the verb *auslesen* would be 'to remove a Theme (completely) from a Container by reading'. The metaphorical meaning of (49b) is similar to that of the resultative construction in (49c). My analysis of *aus* predicts that this lexicalized meaning could only develop because in some abstract sense, the book can be regarded as a Container out of which something can be extracted. Compare (49) with (50):

(50)   a.   *Peter hat die Schlagzeilen gelesen*
                 Peter has the headlines   read
                 'Peter read the headlines'
         b.   **Peter hat die Schlagzeilen ausgelesen*
                 Peter has the headlines Prt-read
         c.   *Peter hat die Schlagzeilen zu Ende gelesen*
                 Peter has the headlines   to   end   read
                 'Peter has finished reading the headlines'

The resultative construction in (50c) shows that there is nothing wrong semantically with the intended meaning of (50b). Nevertheless, (50b) is unacceptable.

This is because headlines, in contrast to a book, cannot be perceived as Containers in a metaphorical sense. The verb *auslesen* can only develop a metaphorical meaning in combination with objects that can conceptually be represented as Containers. If *aus* were an aspectual operator, the difference between (49) and (50) could not be explained.

Let me now turn to aspectual particle verbs derived from the particle *an*.[10] The particle verbs in (51) and (52) indicate that the events expressed by the respective base verbs have only been carried out "partially" or "lightly":

(51) a.   *Peter brät das Fleisch*
              Peter fries the meat
      b.   *Peter brät das Fleisch an*
              Peter fries the meat   Prt
              'Peter fries the meat lightly'

(52) a.   *Peter liest das Buch*
              Peter reads the book
      b.   *Peter liest das Buch an*
              Peter reads the book Prt
              'Peter reads some pages of the book/starts reading the book'

However, despite the fact that *an* apparently takes scope over the whole VP in (51b) and (52b), I suggest again that in these examples, the internal argument is introduced by the particle. I propose the following LCS for *an*:

(53)   *an*:   [$_{Event}$ PARTIALLY AFF([$_{Event}$], [$_{Thing}$]$_{\mathbf{A}}$)]

According to (53), *an* expresses a relation between Events and Things; the latter being "partially affected" by the former (I have not been more specific about this relation, since its exact meaning depends in a large part on the properties of the base verb). The Thing-argument of *an* is obligatorily linked to syntax.

The LCS of *braten*, 'fry', is given in (54).[11] This verb expresses an Event of something becoming roasted. If it combines with *an*, we derive (55):

(54)   *braten*:   [$_{Event}$ INCH ([$_{State}$ BE ([$_{Thing}$]$_{\mathbf{A}}$, [AT ([$_{Property}$ ROASTED])])])]

(55)   *anbraten*:

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[10] The meaning of *an* that I discuss in this section is obviously different from that of the "directed-towards"-*an* discussed in section 2.

[11] Notice that the basic form of *braten*, 'fry', is unaccusative. Its LCS therefore does not include an Agent.

$$[_{Event} \text{ PART AFF}([_{Event} \text{ INCH } ([_{State} \text{ BE } ([_{Thing}],$$
$$[\text{AT } ([_{Property} \text{ ROASTED}])])])], [_{Thing}]_{\mathbf{A}})]$$

(55) illustrates how the two LCSs of the particle and the verb unify. The verb's LCS fills the open argument slot in the particle's LCS. As a result, *anbraten* expresses that something is partially affected by a frying-event. The frying itself still includes a Thing-argument position, the original direct object of *braten*, 'fry'. This Thing, however, is not linked to syntax: the direct object of *anbraten* is the conceptual argument introduced by the particle.

Admittedly, (55) looks a bit like a trick whose sole function seems to be to maintain the hypothesis of this paper. However, the following two observations give independent evidence that (53) is in fact the right representation of the particle's LCS.

First, the particle's argument in (53) is marked with an **A**-index. This implies that the direct object of a particle verb derived from *an* is always obligatory, even if the base verb's argument is optional. (56a) and (56b) illustrate the correctness of this implication:

(56)   a.   *Peter liest* (*das Buch*)
                  Peter reads the book
        b.   *Peter liest* *(*das Buch*) *an*
                  Peter reads   the book   Prt
                  'Peter reads some pages of the book/starts reading the book'

Although *lesen*, 'read', can be used intransitively, the derived particle verb *anlesen* must represent its internal argument in the syntax. This follows from an analysis that keeps the arguments and linking indices of the base verb and the particle distinct. The contrast between (56a) and (56b) would not follow without any further stipulations from the assumption that *an* takes scope over the whole VP and preserves the base verb's linking properties.

The second observation strengthens this point. We expect that intransitive verbs, if inserted into the argument slot of *an*, derive transitive particle verbs. As the example in (57) shows, this expectation is borne out:

(57)   a.   *Peter denkt* (**das Problem*)
                  Peter thinks the problem
        b.   *Peter denkt das Problem an*
                  Peter thinks the problem Prt
                  'Peter starts thinking about the problem'

The verb *denken*, 'think', is intransitive. However, the particle verb *andenken* is obligatorily transitive. The interpretation of the particle *an* in *andenken* is the same as in *anlesen* and *anbraten*. (57b) expresses that the problem is only partially affected by the thinking-event. The only way to derive (57b) from *an* and

the verb *denken* in (57a) is to assume that the internal argument is introduced by the particle. If *an* only had an aspectual function and if the argument structure of the base verb was maintained in the derivation, (57) could not be explained.

Finally, I want to turn to a more problematic aspectual particle, the particle *auf*:

(58) a. *Peter isst sein Stück Kuchen*
          Peter eats his piece (of) cake
      b. *Peter isst sein Stück Kuchen auf*
          Peter eats his piece (of) cake Prt
          'Peter eats up his piece of cake'

The particle *auf* (corresponding to English *up*) that combines with the base verb *essen*, 'eat', in (58) has an aspectual reading comparable to that of the particle *aus*. This is illustrated by the fact that in English, both verbs *eat* and *drink* combine with *up*:

(59) a. *John ate up his cake*
      b. *John drank up his beer*

It is hard to prove that the direct object in (58b) is introduced by the particle. Nevertheless, if we consider examples like (60), it becomes evident that *auf* can modify the argument structure of the base verb:

(60) a. **Peter bläst den Ballon*
           Peter blows the balloon
      b. *Peter bläst den Ballon auf*
           Peter blows the balloon Prt
          'Peter blows up the balloon'

The particle verb *aufblasen*, 'inflate', in (60b) expresses the "completion of an entity by blowing". Since *blasen*, 'blow', is intransitive, (60a), the argument *der Ballon*, 'the balloon', must have been introduced by the particle.

If (60) is paraphrased as "Peter causes the completion of the balloon by blowing", one might assume that (58b) can be paraphrased as "Peter causes the completion of a piece of cake by eating". This is a very odd description of what is going on in eating up a piece of cake. It seems curious to say that in an eating-event, the food is "completed". But notice that it is customary to refer to food that has been eaten up as "finished":

(61)   'Mom, I finished my cake, can I have some more?'

In other words, *aufessen* means "finish something by eating"; *den Kuchen aufessen* means "finish the cake". I tentatively assume that this is the underlying
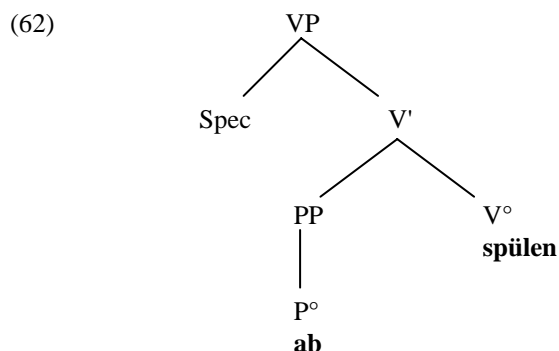
structure of this particle verb; at least with respect to linking, its derivation is compatible with the hypothesis that only particles introduce internal arguments of particle verbs. Notice that the aspectual use of *auf* is not productive; it seems in general that there are only a few aspectual particle verbs with *auf*, all with lexicalized meanings. As such, we may take these particle verbs as metaphorical variants of the derivation that underlies the particle verb in (60b).

5   How syntax restricts the lexicon

In the preceding sections, I have provided empirical data that support the hypothesis that arguments of the particle verb are introduced by the particle. I now propose an explanation based on the theory developed in Zeller (2001).

5.1   Particle verbs and the interface between syntax and the lexicon

A number of people have suggested that syntactically, the verb-particle construction has to be represented as a verb with a phrasal complement of which the particle is the head (cf. Emonds (1972) for English; van Riemsdijk (1978) for Dutch; Taraldsen (1983) for Norwegian; Grewendorf (1990) for German, and many others). On the basis of this idea, I argue in Zeller (2001) that the structure of a prepositional particle verb looks like (62):

(62)

```
                    VP
                   /  \
               Spec    V'
                      /  \
                   PP      V°
                   |     spülen
                   P°
                   ab
```

The fact that the particle is the head of a phrasal complement of the base verb explains straightforwardly the syntactic properties of particle verbs, as discussed in detail in Zeller (2001, chapter 2).[12] However, the phrasal representation in

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[12] (62) explains, for example, why the particle and the verb are separated if the verb moves to Comp, why contrastive particles can be topicalized and modified with adverbs and why the rule of gapping can delete the verbal part of a particle verb. These and other syntactic properties of particle verbs prove to be problematic for any approach according to which the particle verb is a morphologically complex verb (= V^0).

(62) raises the question of how a particle verb can be regarded as a lexical unit, given that the particle and the verb are not part of the same word and therefore are not associated with the same (verbal) head in syntax.
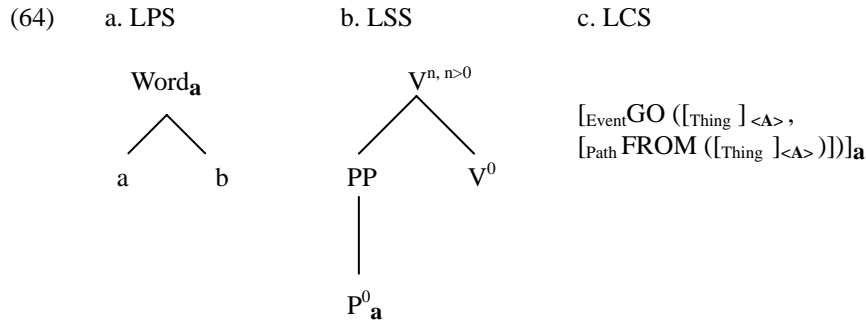
It is obvious that an answer to this question cannot be given if one adopts traditional lexicalist models of grammar, according to which lexical items are "inserted" into terminal nodes in the syntactic tree. In Zeller (2001) I therefore suggest an analysis of particle verbs that is based on an alternative view. In line with proposals made in Marantz (1997) and Jackendoff (1997), I assume that semantic and phonological features are not present in syntactic representations. Rather, I follow Jackendoff (1983, 1990, 1997) and argue that the three components of grammar (phonological structure, syntactic structure, and conceptual structure) are independent generative systems with different atoms and different rules and operations. The link between these systems is established by a separate *interface module* that relates the components of grammar to each other. This interface module is characterized by a set of what Jackendoff (1990, 1997) calls *correspondence rules*; these rules mediate between distinct forms of representations. For example, correspondence rules are necessary to relate the syntactic representation in (63a) to the intonational phrases in (63b) (cf. Jackendoff 1997, 26):

(63)   a. SS: [this [is [the cat [that [ate [the rat [that [ate [the cheese]]]]]]]]]]
         b. PS: [this is the cat] [that ate the rat] [that ate the cheese]

The interface between syntax and phonology must provide rules that guarantee that the syntactic structure in (63a) corresponds to the prosodic structure in (63b). In the same way, correspondence rules between syntactic structure and conceptual structure have to establish the relation between these two components.

Where is the place of the lexicon in this "parallel architecture" of grammar? It is part of the interface module, and lexical entries are nothing other than small correspondence rules that operate at the interface. A lexical entry provides information from all three generative systems and regulates how this information is combined. For example, a simple lexical item like *cat* provides a small chunk of phonology (its Lexical Phonological Structure LPS), a small chunk of syntax (its Lexical Syntactic Structure LSS), and a small chunk of semantics (its LCS), and it *licenses* these parts as the results of three independent derivations performed in phonological structure, syntactic structure, and conceptual structure. What makes *cat* a lexical entry is the fact that knowledge of this word enables the language user to relate a syntactic representation N^0 to a special sound (/kæt/) and a special meaning ("small furry animal").

The crucial advantage of this view of the lexicon is that it is now possible to account for the fact that the lexical interface may access syntactic structures that are larger than the word. This is important when we look at the lexical representation of particles and particle verbs. (64) is the lexical entry for the particle *ab*:

(64)   a. LPS   b. LSS   c. LCS

$$\text{Word}_{\mathbf{a}}$$

$$a \qquad b$$

$$V^{n,\,n>0}$$

$$PP \qquad V^0$$

$$P^0{}_{\mathbf{a}}$$

$[_{Event}\text{GO }([_{Thing}\ ]_{<A>}\,,$
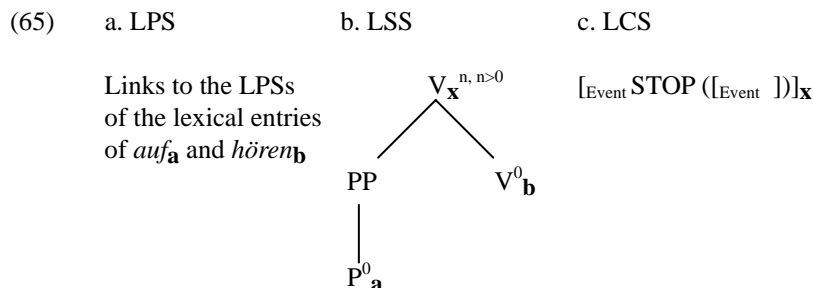$[_{Path}\text{FROM }([_{Thing}\ ]_{<A>})])]_{\mathbf{a}}$

The LPS in (64a) specifies the phonological form of the particle *ab*; the LCS in (64c) (adopted from (13) above) gives its meaning and linking properties. The crucial part is the LSS in (64b). The lexical linking index (the subscript **a**) links the LPS and the LCS of *ab* to a prepositional head P^0. Importantly, however, (64b) not only specifies that *ab* is of category P, it also gives the syntactic environment of the particle. It thereby determines that the sound and the meaning given in (64a) and (64c) can only be linked to a preposition if this preposition is the head of a phrasal complement of a verb. In fact, it is this contextual requirement that makes the preposition *ab* a particle; only in this environment can P^0 be associated with an LCS which is different from that of "regular" prepositions.[13] This explains, for example, why particles like those discussed in this paper can be represented as Event-concepts, although the corresponding prepositions are Places or Paths. Notice that particles and prepositions that have the same phonological form can now be subsumed under one lexical entry, with different meanings depending on different syntactic environments (cf. Zeller (2001) for details).

If the meaning of a particle verb is completely compositional, nothing beyond the correspondence rule (64) needs to be stipulated. When (64b) is applied to a structure created by the syntactic module, the particle meaning is associated with the preposition. The LCS of the verb is linked to the verbal head in syntax, and LCS-unification derives a complex particle verb-meaning associated with V' or VP.

Importantly, particle verbs with an entirely idiomatic meaning can also be represented in this model. For example, consider the particle verb *aufhören*, 'stop, cease' (lit. up-hear) which requires the postulation of an independent lexical entry:

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[13] In Zeller (2001) I argue that particle phrases are exceptional, because "regular" prepositional phrases are dominated by functional structure (the extended projection of the preposition). Therefore, a PP is normally the complement of a functional prepositional head; only particle phrases are complements of the verb. This means that a preposition is only a particle when it is strictly head-governed by the verb (with no functional node erecting a minimality barrier). The exceptional character of particles must be specified in the LSS of the particle's lexical entry in the way illustrated in the text.

(65)   a. LPS   b. LSS   c. LCS

Links to the LPSs $V_{\mathbf{x}}^{n,\ n>0}$ $[_{\text{Event}} \text{STOP} ([_{\text{Event}}\quad])]_{\mathbf{x}}$
of the lexical entries
of *auf*$_{\mathbf{a}}$ and *hören*$_{\mathbf{b}}$

                          PP $V_{\mathbf{b}}^0$

                          $P_{\mathbf{a}}^0$

In the case of an idiomatic particle verb, the $V^{n,\ n>0}$-node in the LSS is directly linked to the special meaning of the whole particle verb, while the LPSs of the P^0- and V^0-nodes are linked to the lexical entries of the preposition and the verb, respectively. This captures the fact that an idiom does not have to repeat the phonological information already given in the lexical entries of its parts.

At numerous points in this paper it has been demonstrated that the meaning of some particle verbs, although derived from and related to the LCS of a particular particle and a particular verb, includes aspects that cannot be traced back to either the verb or the particle. For example, I showed that although all internal arguments are introduced by the particle, the precise syntactic frame in which the particle verb can occur does not always fully exhaust all the possible options provided by the derived LCS. Furthermore, particle verbs exhibit all kinds of idiosyncratic properties (for example, the GO-event expressed by *ab* may be interpreted as change of possession with particle verbs like *abschwatzen*; cf. (26) above). This suggests that the derivation of many particle verbs is a semiproductive process - as Jackendoff (1997, 121) puts it, "the defining characteristic of semiproductive rules is that one needs to know whether each particular form exists, as well as (in many cases) particularities of its meaning and pronunciation".

What exactly does it mean for a compositional analysis of particle verbs if one also needs to know the lexical particularities of many of the derived elements? Jackendoff (1997) takes the position that semiproductively derived lexical items must be listed in the lexicon with all their semantic and phonological properties. This means that the LCS of a particle verb must be listed as soon as there is some aspect of its LCS that cannot be linked to one of its parts - even if the derivation is otherwise clearly based on a particular particle and a particular verb. Although this "full entry"-theory solves the problem that many particle verbs have certain idiosyncratic properties, it seems that we now lose the advantages of trying to give compositional analyses to semi-productively derived particle verbs. The idea behind these analyses is of course that the size of the lexicon can be reduced if the meaning of a derived element is related to the meaning of its parts. However, if we have to list this element as a separate entry anyway, nothing seems to be gained.

Jackendoff's (1975) theory provides a way of accounting for the listedness of semi-productively derived particle verbs without having to give up on the idea that storing these lexical items is somehow "cheaper" than storing completely idiosyncratic forms. Jackendoff (1975) suggests that the "informational cost" of the lexicon is measured in terms of "independent information content". The lexicon includes devices that capture regularities between lexical entries and thereby reduce storage space. The listing of a lexical entry that is related to one or more existing entries requires less effort than listing an entry whose content is completely idiosyncratic. Therefore, we can assume that even if an actual particle verb must be lexically listed, only those aspects of its meaning that are not captured through the lexical entries of its parts take up lexical storage space. To list a particle verb like e.g. *abstellen*, 'put down', for which the conceptual binding index on its Source-argument (cf. (33) above) may be the only independent information not provided by *ab* or by *stellen*, is therefore a lot cheaper than listing a completely idiosyncratic form like the particle verb *aufhören* in (65).

This idea can be incorporated into the present framework by assuming that the basic lexical representation of e.g. the particle verb *abstellen* is similar to (65), with a fully specified LCS (cf. (33) in section 3.3) linked to the node that dominates the verb and the particle phrase. However, in addition to that, the lexical entry also includes links to the LCS-representations of the lexical entries of *ab* and *stellen*. Given that the lexical representation of *abstellen* must include links to the phonological forms of *ab* and *stellen* anyway (cf. (65a)), this additional information probably comes "for free". The LCSs of *ab* and *stellen* then "feed" the complex LCS of *abstellen*, such that the only part of the information that takes up extra storage place in the lexicon is the conceptual binding index on its Source-argument. Even though the particle verb is listed, its entry only increases the size of the lexicon insofar as it *adds* special information to the information already given by the lexical entries of the particle and the verb.

5.2   Particle phrases and the complement of V

The model of the lexical interface illustrated in the previous section is easily compatible with the representational theory proposed in Brody's (1995) "radical minimalist" approach. According to Brody (1995), the syntactic module does not perform derivations, but rather projects one single level of representation (Lexico-Logical Form LLF) that is assembled out of syntactically well-formed chains. LLF can hence be taken to be that level of syntax that is accessed by the interface modules and serves as the target for the correspondence rules that link syntax to phonological and conceptual structure.

Brody's *Generalized Projection Principle* (GPP) regulates the link between the argument projection-properties of a lexical item and the formation of LLF-structures. The GPP requires that a lexical item must project its arguments from the root position of its chain inside its own phrase. Given that a linking index of

a lexical element is the only semantic information that is visible for syntax (cf. Pinker 1989, Jackendoff 1997), it is subject to the GPP, stated as a syntactic condition (cf. Chomsky's (1986) formulation of the θ-criterion as a property of chains). This means that the arguments of a particle must be projected within the PP, and arguments of the verb must be projected inside the VP.

This is where the fact that the particle is syntactically represented as the head of a phrasal complement of the verb becomes relevant. Since Kayne's (1984) binary branching requirement, the assumption that a syntactic head can only take one single complement has been adopted by a number of linguists (cf. Larson's (1988) *Single Complement Hypothesis*, Mulder's (1992) *Single Object Corollary*). The idea behind this assumption is that the transitive relation between a subject of a lexical head and its complement is taken to be fundamental. According to the subject-in-VP hypothesis, the specifier of VP is reserved for the external argument, i.e. the Agent. This leaves only the complement position of V^0 free for an internal argument to be generated.

It follows from these assumptions that the internal arguments of a base verb can never be realized when the verb combines with a particle. Suppose a verb has one internal argument to be realized in syntax. This argument is usually linked to the complement position of V^0. However, the LSS of a particle's lexical entry specifies that the verb's LCS can only be associated with a verbal head in the formation of a particle verb if the verb's complement position is occupied by the particle's maximal projection. This means that whenever a verb combines with a particle, there is no position in the syntactic tree that could be filled with the internal argument of the verb. Therefore, the only way in which the verb can combine with a particle is by deleting or ignoring the linking indices that require the syntactic realization of any of its (internal) arguments. Only if the verb does not link any of its internal arguments to syntax is its complement position free to be occupied by the particle phrase.

Up to two arguments of the particle, however, can be realized within the PP, namely in P^0's specifier and in its complement position. However, because particles cannot assign case[14], an argument-DP that is located inside the particle-PP is presumably only the foot of a DP-chain whose head is located inside a functional specifier position higher up in the tree (where the case of the DP-chain is checked). Notice that the GPP is a condition on the syntactic representation of arguments, not on their thematic interpretation. Although the internal argument of a particle verb is introduced by the particle and projected inside the PP, it is interpreted in the head position of its chain as an argument of the derived particle verb.[15]

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[14] If we assume that the grammatical properties of a lexical item, like its ability to assign case, are only licensed by functional structure, the fact that particles are unaccusative prepositions (cf. Koopman 1993) also follows from the claim that particle phrases lack a functional extended projection (see the previous note).

[15] This account raises the question of how double object verbs are represented. Kayne (1984), Larson (1988), and Mulder (1992) suggest that both internal arguments of a double object verb are generated inside a maximal projection which occupies the single complement position of V^0. The

The LLF-structure of a particle verb like *abspülen*, 'wash, rinse' looks like (66):

(66)
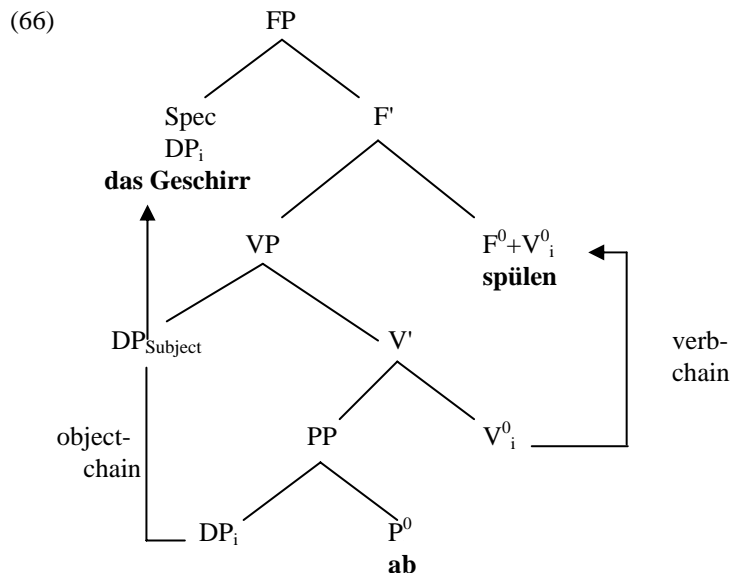
(66) shows how syntax restricts the derivation of particle verbs. Due to the fact that particles occupy the single syntactic position where internal arguments of verbs can be generated, a particle verb's internal argument can never come from the verb, but can only be introduced by the particle.

5.3 Particles without arguments

The analysis suggested in section 5.2 makes an interesting prediction with respect to particles that do not link any Thing-arguments to syntax. One such particle is *los* in (67):

(67) a.   *Peter schreibt los*
              Peter writes Prt
              'Peter starts writing'
       b.   *Peter malt los*

---

head of this maximal projection is taken to be a phonetically empty predicate (an empty possessive verb or a verbal trace) that introduces the two internal arguments. Particles in German now can be considered to be overt realizations of this thematic predicate; they occupy the complement position of the verb and introduce internal arguments.

        Peter paints Prt
        'Peter starts painting'

The particle *los* has an ingressive reading. Its meaning can be represented as in
(68):

(68)   *los*: $[_{\text{Event}} \text{ INCH } ([_{\text{Event}} \ ])]$

In Jackendoff (1990), the function INCH is taken to express the "coming about"
of a particular state of affairs. In (68), I have used this predicate to express the
start of the event that fills the argument slot of INCH. INCH therefore takes an
Event as its argument; if (68) combines with an eventive verb, the LCS of this
verb fills the Event-slot in (68), and the derived particle verb expresses the start
of this event.

    According to the analysis presented in the previous sections, the particle *los*
also projects a phrase in the complement position of the verb. My analysis now
predicts that particle verbs derived from *los* are always intransitive: The parti-
cle's LCS does not contribute any arguments that could be represented in syntax,
and the verb cannot contribute any arguments, since its complement position is
occupied by the particle phrase.

    This prediction is borne out. The verbs *schreiben* and *malen* take optional in-
ternal arguments, (69a), (70a), but a transitive use is impossible with the respec-
tive particle verbs derived with *los*:

(69)   a.   *Peter schreibt ein Buch*
            Peter writes   a book
    b.   **Peter schreibt ein Buch los*
            Peter writes   a book   Prt

(70)   a.   *Peter malt ein Bild*
            Peter paints a picture
    b.   **Peter malt ein Bild los*
            Peter paints a picture Prt

Although there is nothing wrong semantically with the transitive (b)-examples
in (69) and (70), it is impossible to use the particle verbs transitively. This shows
that it is in fact a syntactic property of particles (i.e. their phrasal status) that
excludes the realization of internal arguments of the verb.

6 Conclusion

The hypothesis that internal arguments of particle verbs are always introduced
by the particle accounts for the transitivization and ditransitivization properties

observed with many particles. It also explains why in some cases, internal arguments of a verb can no longer be realized when a particle is added. The observation that transitive particle verbs may be derived from intransitive, transitive, and ditransitive base verbs also follows from this hypothesis. Finally, even those examples of particle verbs that at first sight seem to have maintained the argument structure of the verb corroborate the claim that a particle verb's internal arguments do not come from the verb, but are linked to syntax because of the linking properties specified in the particle's lexical entry.

I have sought to demonstrate that the reason behind this observation is syntactic. I argued that particles project phrases that occupy the only syntactic position in which internal arguments of the verb can be realized. Therefore, the verb cannot link its arguments to syntax if it combines with a particle; consequently, particle verbs can only take internal arguments that were originally conceptual arguments of the particle.

This is an interesting conclusion, because it challenges the traditional view that the relation between syntax and the lexicon is unidirectional. Although it is a standard assumption that the argument structure of a lexical item determines the way syntactic structures are built, it is a more controversial idea that the rules of "core syntax" also have an impact on the linking properties of a (derived) lexical element. I hope that my analysis has provided evidence for this new perspective and therefore has opened a window into that domain of grammar that deals with the interaction between syntax and semantics which is restricted by the properties of the lexical interface.

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