On verbal modifiers and their thematic properties

Jochen Zeller; April 1996
Draft, Umass

0. Introduction

In this paper, I investigate some of the properties of particles and verbal prefixes in German. Consider the modifications of the verbs in (1)-(4):

(1) (a) (*daß*) *Peter den Wagen voll lädt*
(that) Peter the wagon-ACC full loads

(b) (*daß*) *Peter den Mann auf den Berg hinauf bringt*
(that) Peter the man-ACC on the mountain on brings

(2) (a) (*daß*) *Peter den Mann aufhält*
(that) Peter the man-ACC Prt-holds
"that Peter stops the man"

(b) (*daß*) *Peter den Satz abschreibt*
(that) Peter the sentence-ACC Prt-writes
"that Peter copies the sentence"

(3) (a) (*daß*) *Peter den Wagen belädt*
(that) Peter the wagon-ACC Pref-loads
"that Peter loads the wagon"

(b) (*daß*) *Peter die Munition verschießt*
(that) Peter the ammunition-ACC Prt-shoots
"that Peter gets rid of the ammunition by shooting"

(4) (a) (*daß*) *Peter die Stadt überfliegt*
(that) Peter the city-ACC over-flies

(b) (*daß*) *Peter den Fluß durchschwimmt*
(that) Peter the river-ACC through-swims

The examples in (1)-(4) show four substantially different kinds of verbal modifiers. (1)(a) and (b) are *resultative* constructions: the adjective *voll* and the postposition *hinauf* both describe the "result state"[1] of the event expressed by the verbs *laden* and *bringen*, respectively. Henceforth, I refer to these verbal modifiers as *resultatives*. The elements *auf* and *ab* in (2) are typically called *particles*. Particles are prepositional elements (cf. Emonds 1976; van

[1] In this paper, I adopt Kratzer's (1995) notion of "result state" to describe the terminal state of an event (see also Borer 1996). I do not want to go into the problems that arise with the similiar terms "resultant state" or "target state" here (but see Parsons 1990 for discussion).

Riemsdijk 1978; Hoekstra 1988; Den Dikken 1995), although their roots may also be adverbial (cf. Stiebels 1996).

(3) shows two of the most frequent verbal *prefixes* in German. Although they are diachronically derived from directional or local prepositions (cf. Stiebels 1996), the interpretation of most prefixes is no longer related to the meaning of some existing preposition (but see Wunderlich 1987 and section 3.2). As opposed to the particles in (2), the verbal prefixes in (3) are bound morphemes. In this respect, they also differ from the prefixes in (4) which can also appear as heads of a PP as shown in (5):

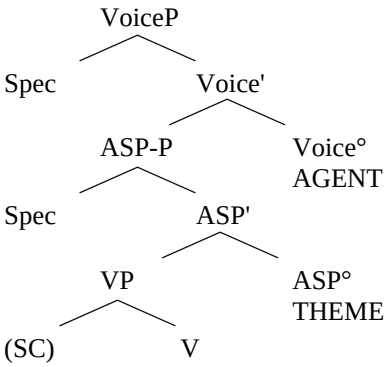
(5) (a) *Peter fliegt über die Stadt*
Peter flies over the city-ACC

(b) *Peter schwimmt durch den Fluß*
Peter swims through the river

The derivation of verbs as in (4) is analyzed as preposition incorporation PI (cf. Baker 1988, Wunderlich 1987, Stiebels 1996). For this reason, the modifiers in (4) are called *P-prefixes*.

In this paper, I will argue that the base structure (below TP) of German looks as follows:

(6)



My starting point is the assumption that the lexical entry for a bare verb does not contain any information about its (individual-type) arguments. Instead, I argue that verbs only express properties of events. All thematic arguments are introduced by syntactically and semantically independent predicates. The predicate that introduces the so-called external argument of the verb is located in a Voice-projection in (6) (cf. Kratzer 1994, 1995).The predicate that is responsible for the internal argument can be overtly realized by a verbal modifier in German. Whereas prefixes are generated in the head of ASP above VP, particles and resultatives are located in a SC-complement of the verb. P-prefixes are also base generated inside the SC, but combine with the verb at S-structure.

The paper is organized as follows. In section 1, I show that resultatives, particles, and prefixes can be distinguished with respect to a number of properties. I also show how these elements affect the argument structure of the verb they combine with and how they can modify the the aspectual properties of the event described by this verb.

In section 2, I illustrate two different syntactic analyses proposed for verbal modifiers given in the literature, namely the Small Clause (SC) analysis and Borer's (1994, 1996) theory of aspectual structure. I suggest that the former accounts for the distribution of particles and resultatives, whereas the latter can be used as a basis for an analysis of prefixes in German. I show that the structural properties of particles and resultatives can be explained under the assumption that these elements do not leave the SC at S-structure, but incorporate into the verb at LF.

In section 3, I take a closer look at the semantics of verbal modifiers, especially with respect to their effects on the argument structure of a sentence. I also discuss some implications of the idea that arguments are severed from the verb in the syntax. In section 4, I point to some parallels between verbal modifiers in German and aspectual markers in Slavic languages.

1. Properties of verbal modifiers

1.1 Structural differences

Resultatives and particles behave similiarly with respect to their phonological and morphological properties. If they combine with a verb, they always bear stress:

(7) (a) '*voll laden*
(b) '*aufhalten*

The infinitival marker *zu* and the past participle affix *ge-* always appear between the modifier and the verb:

(8) (a) *vollzuladen*
(b) *aufzuhalten*
(9) (a) *vollgeladen*
(b) *aufgehalten*

If the verb moves to COMP in order to derive verb second, resultatives and particles must be stranded. For this reason, they are also called "separable prefixes":

(10) (a) *Peter lädt den Wagen voll*
Peter loads the wagon full

(b) *Peter hält den Mann auf*
Peter holds the man Prt

However, resultatives differ from particles in that the former, but not the latter, can be topicalized alone:

(11) (a) *Voll hat Peter den Wagen noch nicht geladen*
Full has Peter the wagon still NEG loaded

(b) **Auf hat Peter den Mann noch nicht gehalten*
Prt has Peter the man still NEG held

This syntactic difference seeems to have a semantic reason: The resultative *voll* in (a) has a clear and constant adjectival meaning, whereas the particle in (b) does not (for example, it differs from the prepositional meaning of *auf*). Kratzer (1994) therefore calls resultatives "stable" and particles "unstable" prefixes and distinguishes them on the basis of their ability to undergo topicalization (cf. also van Riemsdijk 1978).[2] Hence we can use topicalization as a test for the membership of elements to one of these two classes.[3] In should be noted, however, that certain words in German can appear both as resultatives and as particles:

(12) (a) *Aus hat Peter das Radio heute noch nicht geschaltet*
off has Peter the radio-ACC today still NEG switched

---

[2] In general, topicalization of a particle/resultative is unacceptable if the DP is indefinite (cf. Kratzer 1994)

[3] Stiebels (1996) shows that not every element that functions as a resultative can be topicalized. A further necessary condition for a verbal modifier to undergo topicalization is contrariness:

(i) (a) *Sie hat die Tür aufgemacht/zugemacht*
She has the door open-made/close-made

(b) *Auf hat sie die Tür gemacht*
Open has she the door made

(ii) (a) *Er hat das Schloß aufgebrochen/*zugebrochen*
He has the lock open-broken/close-broken

(b) **Auf hat er das Schloß gebrochen*
Open has he the lock broken

Although *auf* is used adverbially in both (i) and (ii), it cannot be topicalized in (ii) because the derived verb lacks a contrasting version.

(b) **Aus hat Peter den Lehrer heute noch nicht gelacht*
Prt has Peter the teacher-ACC today still NEG laughed
"Today, Peter still hasn't laughed at the teacher"

(13) (a) *An hat Peter das Radio noch nicht geschaltet*
on has Peter the radio-ACC still NEG switched

(b) **An hat sich Peter das Lied noch nicht gehört*
Prt has Refl. Peter the song still NEG heard
"Peter still hasn't listened to the song"

Whereas *aus* and *an* in (12)(a) and (13)(a) are clearly adjectives (the radio ends up off or on as the result of Peter turning the switch), the meaning of the particles is not related to that adjectival meaning at all.

Prefixes differ fundamentally from resultatives and particles. If they combine with the verb, the accent remains on (the first syllable of) the verb:

(14) (a) *be'laden*

(b) *über'laden*

The infinitival *zu* does not appear between prefix and verb stem but precedes the derived verb; the participal forms lack the affix *ge-*[4]:

(15) (a) *zu beladen*

(b) *zu überladen*

(16) (a) *beladen*

(b) *überladen*

[4] The lack of *ge-* follows directly from the intonation pattern that was observed with prefixed verbs: In German only those verbs whose first syllable is stressed take the affix *ge-* in the participle. Compare (i) and (ii):

(i) (a) 'ma-chen
make

(b) *ge-'macht*
made-PPP

(ii) (a) stu'-die-ren
study

(b) stu'diert
studied-PPP

While *machen*, like most German verbs, carries stress on the first syllable and therefore takes *ge-* in the participle, *studieren* starts with an unstressed syllable and is thus not prefixed with *ge-*. Since prefixes are always unstressed, they never fulfil the phonological requirement for selecting the participle affix *ge-*.

Neither the bound morpheme-prefixes nor the P-prefixes can be topicalized. Nor can they be stranded: in verb second, they have to move together with the verb:

(17) (a) *Peter belädt den Wagen*
Peter Pref-loads the wagon

(b) *Peter überlädt den Wagen*
Peter overloads the wagon

1.2 Aspect and argument structure

Resultatives and prefixes can change argument structure, i.e. they can add an argument which is clearly not an argument of the verb. This argument always becomes the direct object and receives accusative case:

(18) (a) **Peter lief seine Schuhe*
Peter ran his shoes-ACC

(b) *Peter lief seine Schuhe kaputt*
Peter ran his shoes-ACC off

(19) (a) **Peter arbeitete das Buch*
Peter worked the book-ACC

(b) *Peter bearbeitete das Buch*
Peter Pref-worked the book-ACC

In (18), the direct object is introduced via predication: The resultative adjective is a predicate that needs to have an argument. Prefixes often are also analyzed as predicates (cf. Stiebels 1996); prefixed verbs in German always come with an internal argument. If a prefixed verb is intransitive, it is unaccusative (the internal argument appears in subject position). This is shown in (20) and (21): The prefixed verbs take the auxiliary *sein* in the perfect tense, they do not form impersonal passive, and they do allow attributive use of the past participle (cf. Grewendorf 1989):

(20) (a) *Der Sträfling ist der Polizei entlaufen*
The convict is the police-DAT Pref-run
"The convict has escaped the police"

(b) **Es wird entlaufen*

(c) *Der entlaufene Sträfling*
The escaped convict

(21) (a) *Die Blumen sind erblüht*
The flowers are blossom-PPP

(b) **Es wird erblüht*

(c) *Die erblühten Blumen*
The blossomed flowers

If resultatives and prefixes combine with a transitive verb, the direct object of the derived verb can be different from the one originally selected by the verb. This indicates that the internal argument is in fact introduced by the verbal modifier (cf. Booijs/van Haaften 1988; Neeleman/Schipper 1992):

(22) (a) *Peter ißt einen Apfel*
Peter eats an apple-ACC

(b) *Peter ißt sich satt*
Peter eats Refl.-ACC full

(23) (a) *Peter schreibt einen Brief*
Peter writes a letter

(b) *Peter verschreibt viel Tinte*
Peter Pref-writes much ink
"Peter uses up much ink in writing"

The situation is more complicated with particles. Particles can also introduce new arguments (24), they can saturate (apparent) predicative arguments of the verb (25), and they even seem to be able to block the realization of an argument (26):

(24) (a) **Peter lachte den Lehrer*
Peter laughed the teacher

(b) *Peter lachte den Lehrer aus*
Peter laughed the teacher Prt

(25) (a) **Peter stellte das Buch*
Peter put the book

(b) *Peter stellte das Buch ab*
Peter put the book Prt

(26) (a) *Peter malte ein Bild*
Peter painted a picture

(b) *Peter malte* (**ein Bild*) *los*
Peter painted a picture Prt

Verbal modifiers can change the aspectual properties of a sentence. In most cases, this follows from their argument structure-changing properties. Direct internal arguments play a crucial role in determining the aspectual properties of a predicate. In the theory of Tenny (1992, 1994), for example, the direct internal argument is responsible for "measuring out" or "delimiting" the event, thereby yielding a telic or resultative interpretation of the predicate. This effect of the internal (Incremental Theme) argument on the aspect of the whole verbal predicate has been investigated and formally analyzed in Bach (1981, 1986); Krifka 1989, 1992), Dowty (1991), Tenny (1992, 1994), and Filip (1992, 1993, 1995), for example. If a verbal modifier combines with an intransitive verb and makes it transitive, it might change an Accomplishment into an Activity (using Vendler's (1967) famous classification of situation types or *Aktions-arten*).

Some particles and prefixes, however, can also have further aspectual functions (cf. Stiebels 1996):

(27) (a) *Die Rosen erblühen*
The roses Pref-bloom
"The roses start to bloom"

(b) *Peter schläft ein*
Peter sleeps Prt
"Peter falls asleep"

(c) *Peter malt los*
Peter paints Prt
"Peter starts painting"

(d) *Die Rosen verblühen*
The roses Pref-bloom
"The roses bloom until they die"

The verbs in (27)(a)-(c) all focus on the coming about of the event, hence the modifiers are ingressive markers. (27)(d) has an egressive interpretation and focuses on the exit from an event.

2. Syntactic Approaches

2.1 Small Clauses, resultatives, and particles

The most frequently adopted structural approach to verbal modifiers is the SC-analysis first proposed in Stowell (1981), motivated for particle constructions by Kayne (1984, 1985), and

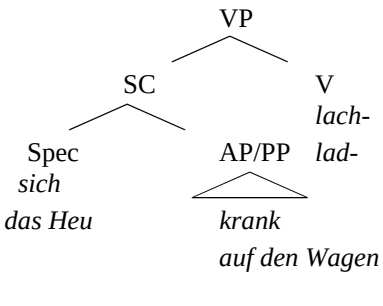
elaborated for resultatives by Hoekstra (1988). The SC-analysis accounts for a number of syntactic phenomena that I do not want to discuss here (but see Kayne 1984; Hoekstra/Mulder 1990; Hoekstra 1992, for detailed discussion). The SC-analysis allows for a syntactic representation of the subject-predicate relationship that holds between the direct object of a sentence and resultative phrases like *flach* and *auf den Wagen* in (28), for example. Furthermore, the SC seems to provide a natural location for other verbal modifiers as well: as shown in section 1.2, particles may also be predicates. Therefore, they are analyzed as heads of SCs (see also Hoekstra 1988; Grewendorf 1990; Mulder 1992; Steinbach/Vogel 1994; Den Dikken 1995; von Stechow 1995, among others). (28) and (29) are represented as in (30):

(28) (a) *daß Peter sich krank lachte*
that Peter Refl.-ACC sick laughed

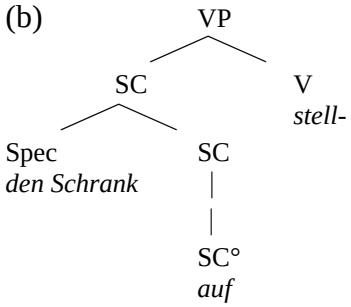
(b) *daß Peter das Heu auf den Wagen lädt*
that Peter the hay-ACC on the wagon loads

(29) *daß Peter den Schrank aufstellt*
that Peter the closet-ACC Prt-put
that Peter put the closet together

(30) (a)



(b)



The SC selected by the verb constitutes the relevant subject-predicate relation. The adjective *krank*, the PP *auf den Wagen* and the particle *auf* are predicated of the direct objects (the "subjects of result") in the specifiers of their SCs which describe the result states of the respective events.

In German, there is another construction of a resultative predicate that can occur: A postpositional phrase PostP:

(31) (a) *daß Peter das Heu auf den Wagen auflädt*
that Peter the hay-ACC on the wagon onto-loads

(b) *daß Peter den Mann über die Brücke hinüberschickt*
that Peter the man-ACC over the bridge over-sends

(c) *daß Peter die Brücke hinübergeht*
that Peter the bridge-ACC over-goes
"that Peter walks over the bridge to the other side"

Van Riemsdijk (1990) calls the relevant structures in (31)(a) and (b) "circumpositional phrases". According to his proposal, postpositions are functional prepositions that select full PPs. Simple postpositional phrases like (31)(c) are the result of moving the head of that PP into the empty functional position to the right of the PP. In the case of circumpositional phrases, the postpositional element is base-generated in this position and stands in an agreement relationship to the preposition heading its complement PP.

It should be pointed out that the internal direct object in (31)(a) and (b) is generated in SpecSC and receives accusative case from the verb (after movement out of the SC), whereas the (apparent) direct object in (c) is the stranded argument of the moved pre/postposition which assigns accusative case. In (c), *Peter* is generated as the subject of the SC, but receives nominative case after movement to some higher functional position (see also section 2.3). If the subject of a SC receives accusative case from a transitive verb, whereas at the same time a postposition assigns accusative to its argument, we expect to find sentences with two arguments bearing accusative case. This expectation is indeed borne out:

(32) *Peter schickt den Mann die Brücke hinüber*
Peter sends the man-ACC the bridge-ACC over

Whereas *den Mann* receives accusative from the verb, *die Brücke* receives the same from the postposition (or from its trace, if it has been moved, according to van Riemsdijk's (1990) proposal).[5]

I conclude that the predicative part of a SC in German can also be a PostP. Notice that the complement of a postposition can also be completly omited:

[5]Another implication of sentences like (32) is that there are sentences with unaccusative verbs that include accusative objects. This might be a solution to a puzzle that comes up on different occasions in the literature on aspect. Dowty (1991) and Filip (1993), for example, argue against the hypothesis that internal objects are the only arguments that affect the aspect of a verbal predicate (cf. Tenny 1994, for example) by giving the following example:
(i) *John entered the icy water*
In (i), it is clearly the subject *John* that measures out the event. Dowty and Filip claim that (i) also excludes the possibility that *John* has been derived from an internal argument position, since (i) has a real direct object. However, as (32) shows, this is not convincing. In fact, (i) might be a verb derived by (lexical) incorporation of a preposition into a phonetically empty verb. This light verb selects *John* as an internal argument, and the preposition assigns accusative to *the icy water*. Furthermore, the German translation of *enter* (*hineinsteigen*) is indeed a verb modified with a postposition and selects the auxiliary *sein* in the present perfect. This strongly suggest that *enter* is unaccusative.

(33) (a) *daß Peter das Heu auflädt*
that Peter the hay on-loads

(b) *daß Peter den Mann hinüberschickt*
that Peter the man over-sends

But now (33) looks very similiar to particle constructions as in (29) above, and one might wonder if postpositions *are* in fact particles. Van Riemsdijk (1978:91) notes that "this question is not a trivial one....motional postpositional phrases do in fact originate as such, but...the postposition may undergo the rule of particle incorporation". Van Riemsdijk (1990:234) emphasizes this point: "The postpositional element may sometimes be or become a verbal particle, perhaps through some process of incorporation, but genuine postpositional and circumpositional phrases do exist".

There is an important semantic difference between the modifier in (29) and the one in (33): The verb *aufladen* means "to load on something". Hence, *auf* has a clear pre(post)positional meaning. But *aufstellen* in (29) has not; it simply means "put up".[6] Here, *auf* is a real particle. Furthermore, only *aufladen* can be modified with *dr-*, a prenominal prefix that only appears with postpositions but not with particles (cf. Steinbach/Vogel 1994), and (34)(a) means the same as (33)(a). The verb *aufstellen* cannot be modified with *dr-*:

(34) (a) *daß Peter das Heu drauflädt*

(b) **daß Peter den Schrank draufstellt*

(34)(b) only becomes grammatical if we change its meaning to "Peter put the closet on (something)". But then the verb does not mean the same thing as *aufstellen* in (29) because *drauf* is a postposition and not a particle.

The main structural difference between (29) and (33)(a) is that the next maximal projection dominating the particle in (29) is the SC, whereas the postposition is dominated by the PostP. Now note that SCs generally do not undergo syntactic movement (cf. Den Dikken 1987, 1995), but PostPs do. Hence, we expect that the postposition in (33)(a) can be topicalized, whereas the particle in (29) cannot. This expectation is borne out:

(35) (a) ?**Auf hat er den Schrank noch nicht gestellt*

[6] In *aufstellen*, the particle rather carries the meaning of the adverb *empor*, "upwards" (cf. Stiebels 1996).

(b) *Auf hat er das Heu noch nicht geladen*

Now we have found a natural explanation for the topicalization differences illustrated in section 1.1: If a verbal modifier functions as a resultative postposition or adjective inside the SC, its maximal projection can move out of the SC. If a verbal modifier is a particle, this option is structurally excluded because SCs do not move and heads cannot be topicalized.

Particles are historically derived from adverbial elements, postpositions or prepositions, but have become independent elements in modern German. This derivation can be seen as a direct consequence of the structural similiarities between (29) and (33)(a). The historical change is structurally mirrored by a change from a subject-predicate structure with the predicate as an independent XP to a SC structure with the predicate as its (particle) head.

In English, particles can also appear with predicative adjectival or prepositional complements (cf. Den Dikken 1995):

(36) (a) *They painted the barn up red*

(b) *They put the books down on the shelf*

In German, the combination of a particle and a resultative predicate is also possible:

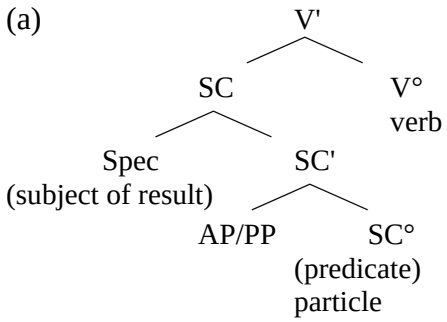
(37) (a) *Sie malten die Scheune rot an*
They painted the barn red Prt

(b) *Sie schickten die Briefe in die USA ab*
They sent the letters in the USA Prt

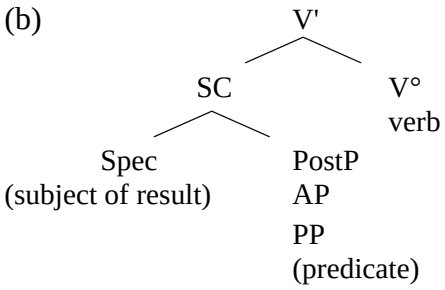
The most natural explanation for the data in (37) is to assume that the particle can select the PP or AP as a syntactic complement (cf. Hoekstra/Mulder 1990; Den Dikken 1995). Hence, we have two different possible structures for a SC: [7]

[7] To account for the data in (36), Den Dikken proposes a more complex structure for the SC: In his approach, the particle selects an AP or PP complement which also projects a specifier. The subject of result is generated in this position, but has to move to the specifier of the particle to receive case from the verb.

(38) (a)



(b)



I discuss some semantic implications of these structures in section 3.4.

Most theories mentioned in this section share the postulate that all verbal modifiers located in the SC can overtly incorporate into the verb. This claim has to be rejected at least for German, as I will show. Instead, while I adopt the SC-analysis for particles and resultatives in German, I assume that these elements remain inside the SC until LF. My basic claim is that these elements do not incorporate into the verb in overt syntax and hence differ in the respective properties from verbal prefixes. They are heads of a SC-complement (cf. Keyser/Roeper 1995 for a similiar idea for English particles). I assume that the notion of "separable prefix" is misleading: There are no separable prefixes in German, the particles and resultatives that apparently are separated from the verb have never been attached to it.

However, particles and resultatives do combine with the verb at LF, a process that is known as *abstract incorporation* or *reanalysis* (cf. Baker 1988; Grewendorf/Sabel 1994). Abstract incorporation is expressed by coindexation of the relevant heads. Thus, the particle/resultative and the verb bear the same index at S-structure and therefore count as *non-distinct*. Consequently, the SC-projection does not constitute a barrier according to the definition given in Baker (1988). It follows that although particles and resultatives do not form an S-structural unit with the verb, the SC does not block movement of XPs out of the SC.[8]

Let me consider some arguments in favor of the view that the particle/resultative element remains in the SC at S-structure. Consider the resultative phrases in (39):

(39) (a) *daß Peter das Bild zu Ende malt*
that Peter the picture-ACC to end paints
"that Peter finishes the painting"

[8] In German, a special class of verbs allows for long scrambling out of their infinitival complements. Grewendorf/Sabel (1994) explain this fact by showing that these verbs undergo reanalysis with the infinitive, i.e. the infinitival verb incorporates into the the matrix verb at LF. This is how barriers are opened to allow for long scrambling. Hence in German, abstract incorporation is a process that does not only occur with particles and resultatives, but also with infinitival complements.

(b) *daß Peter die Zeitung in Stücke reißt*
that Peter the newspaper-ACC in pieces tears
"that Peter tears the newspaper into pieces"

According to the SC-analysis, the PPs in (39) are predicates, having the internal arguments as their (structural and semantic) subjects. The intonation pattern of the PP+verb looks as follows:

(40) (a) *zu 'Ende malen*

(b) *in 'Stücke reißen*

In this respect, (40) patterns with (41): The (non-contrastive) intonation has the stress on the argument of the verb or on the adjectival predicate:

(41) (a) *ein 'Bild malen*
a picture paint

(b) *'traurig sein*
sad be

Of course, no one has ever suggested that the PPs in (39) or their heads incorporate into the verb at S-structure. They remain in the SC. If the verb moves to functional positions to receive aspectual or temporal morphology, inevitably we derive (42) and (43):

(42) (a) *zu Ende gemalt*
to end painted-PPP

(b) *zu Ende zu malen*
to end to paint

(43) (a) *in Stücke gerissen*
into pieces torn-PPP

(b) *in Stücke zu reißen*
into pieces to tear

In verb second sentences, only the verb moves and leaves the PP behind:

(44) (a) *Peter malt das Bild zu Ende*

(b) *Peter reißt die Zeitung in Stücke*

The adjectives and postpositions that are base generated inside a SC not only yield a resultative interpretation like the PPs in (39), but their intonational, morphological and syntactical behavior also patterns exactly with the behavior of these PPs. Consequently, there is no reason to assume that they incorporate overtly into the verb. The same is true for particles. They do not form a unit with the verb at S-structure either. This is the reason why they behave like independent XP-arguments with respect to intonation, morphology and movement.[9]

It should be pointed out that this idea predicts that extraposed elements can appear between the verb and the particle if the category to which they are right-adjoined is below the position of the verb at S-structure. With certain elements, this is indeed possible: [10]

(45) (a) *daß Peter die Briefe von hier wegschickte*
that Peter the letters-ACC from here off-sent

(b) *daß Peter die Geschenke nach Hause mitnimmt*
that Peter the presents-ACC at home with-takes

(46) (a) *daß Peter die Briefe weg von hier schickte*

(b) *daß Peter die Geschenke mit nach Hause nimmt*

Most of the time, however, this option is excluded:

(47) (a) **daß Peter den Lehrer aus gestern lachte*
that Peter the teacher Prt yesterday laughed

(b) **daß Peter ein spät schlief*
that Peter Prt late slept
"that Peter fell asleep late"

However, the adverbs in (47) cannot intervene between the PPs in (39) and the verb either:

---

[9] I am aware of the fact that the appropriate orthographical representation of particle verbs as *einzuschlafen*, "to fall asleep", and *auszutrinken*, "to drink up", should be *ein zu schlafen* and *aus zu trinken*, according to my theory. But this is not surprising, given that the particle and the verb in fact are separated from each other in verb second. Of course, this proposal only works with the traditional view that German has a base structure where the head of a phrase is on the right (but see Zwart 1993 for the opposite assumption).

[10] Grewendorf (1990) assumes that the underlying structure for sentences like (45)(b) is the structure in (i):

(i) [$_{SC}$ [$_{SC}$ die Geschenke nach Hause] mit] nehmen

To derive the word order in (46)(b), according to Grewendorf, the inner SC has to move first, then the SC-subject has to be extracted, and then the SC, containing only the PP, has to be extraposed behind the verb. If the verb subsequently moves to a higher position, the word order in (46)(b) is derived. I think that this complex derivation can be avoided under the assumption that *mit* and the PP in (45)(b) form one constituent.

(48) (a) **daß Peter das Bild zu Ende gestern malte*

(b) **daß Peter die Zeitung in Stücke spät riß*

Apparently, the oddness of (48) is not because the particle has to incorporate into the verb at S-structure. Every explanation for why (48) is ungrammatical pertains also to (47).

There is a more serious problem with this account, however. Complex particle verbs can be input to derivational morphology (NOM and ADJ stand for nominal and adjectival affixes):

(49)	(a)	*abwaschen* Prt-wash "wash up"	-	*Das Geschirr ist unabgewaschen* The dishes are un-Prt-washed "The dishes are undone"
	(b)	*einstellen* Prt-put "to engage"	-	*die Einstellung* the Prt-put-NOM "the engagement"
	(c)	*angreifen* Prt-grip "assail"	-	*angreifbar* Prt-grip-ADJ "assailable"

If the inputs for derived nouns or adjectives as in (49)(a)-(c) are verbal heads, then the data present a challenge to my claim that the particle and the verb do not combine at S-structure. Stiebels (1996), for example, takes the words on the right hand side as proof for her assumption that the particle must be unseparably combined with the verb. However, although this conclusion initially seems unavoidable for adjectives and nouns that include a particle, the different positions of particle and verb in verb second make this assumption unwarranted for the verbal domain. I therefore maintain the proposed syntactic analysis for particle verbs and suggest that the derived nouns and adjectives in (49) are the result of a morphological derivation. They are lexical rather than syntactic derivations.

Kratzer (1994) argues that adjectival participles in German can be lexical and phrasal. If they are lexical, the participle affix is generated as the sisiter of V. Kratzer argues further that the prefix *un-* cannot attach to a phrasal category. It can only lexically adjoin to an adjectival head. This implies that *unabgewaschen* must be a lexical participle. In (49)(a), we then first derive a lexical adjectival participle *gewaschen* which is a head of category A. Now

before *un-* combines with the adjective, the particle is attached to it to derive *abgewaschen* which in turn combines with *un-*.[11]

Note that adjectival participles can also be phrasal. In this case the participle affix is base generated as the sister of a VP (cf. Kratzer 1994; Borer 1996), and the verbal head can select a SC with a particle. When the verb incorporates into the adjectival head, the particle is left behind (as in the case of the syntactic derivation of the verbal participle). Hence, whereas *unabgewaschen* is an adjectival head, *abgewaschen* is an AP with a participle as its head and a stranded particle in a SC complement.

Evidence for the structural differences between *abgewaschen* and *unabgewaschen* is provided by the data in (50). Only the participle *abgewaschen* can be modified with an adverbial phrase, and thus it has to include a VP. This modification is not possible with *un-*prefixed participles (cf. Kratzer 1994):

(50) (a) *Das Geschirr ist schlecht abgewaschen*
The dishes are badly un-Prt-wash

(b) **Das Geschirr ist schlecht unabgewaschen*
The dishes are badly un-Prt-washed

The particle in (50)(a) is a complement to the VP in the participle. We expect that other complements can also appear with adjectival participles. (51) shows that cases like this do in fact exist:

(51) *Die Kinder sind noch nicht ins Bett gebracht*
The children are still NEG to bed brought

The noun in (49)(b) might be derived lexically by attaching the particle to V + *-ung*. But the derivation may also be similiar to the derivation of phrasal adjectival participles: The nominal affix is generated as the sister of the VP that includes the SC with the particle. The verb then incorporates into N. Note that other complements of the verb can also be part of a derived nominal:

(52) *etwas zur Schau stellen* - *die Zurschaustellung*
"to put sth. on display" "the display"

[11] This was suggested to me by Tom Roeper. The same proposal is made by Neeleman/Schipper (1992). However, Neeleman/Schipper also analyse the combination particle+verb as a (verbal) compound, whereas they do not form an S-structural unit in my account.

Finally in (49)(c), we also have two possibilities: Either we derive the adjective lexically by attaching the particle to the adjectival complex V + *-bar*, or the adjective is derived phrasally, with *-bar* attached to a VP which includes a SC. I do not commit myself to either of these views.

Some further questions arise. First, the derivation of adjectives and nouns is not unrestricted. (53) suggests that *un*-prefixed participles seem possible only with particles, not with resultatives:

(53) (a) *Das Manuskript ist weggeschickt*
The manuscript is off-sent

(b) **Das Manuskript ist unweggeschickt*

(54) (a) *Das Manuskript ist abgeschickt*
The manuscript is Prt-sent

(b) *Das Manuskript ist unabgeschickt*
The manuscript is un-Prt-sent
"The manuscript is not sent off"

As pointed out by Kratzer (1994), (53)(a) is semantically identical to (54)(a), and thus the ungrammaticality of (53)(b) cannot be due to semantic restrictions. Kratzer explains the contrast between (53)(b) and (54)(b) by assuming that the resultative in (53) cannot form a lexical participle, since it introduces an argument and hence projects an XP. Since *un-* can only attach to lexical categories, (53)(b) is excluded. However, (55) shows that the impossibility of *un*-prefixation cannot be a consequence of argument selectional properties:

(55) (a) **Peter ist uneingeschlafen*
Peter is un-Prt-slept

(b) *Der Fernseher ist unangeschaltet*
The TV is un-on-switched

In (55)(a), the particle has only an aspectual meaning and does not select an argument. Nevertheless, *un*-prefixation is impossible. In (55)(b), in spite of the argument-selecting properties of the adjective *an*, *un*-prefixation of the participle can occur. It is not clear why (53)(b) and (55)(a) are excluded, whereas (54)(b) and (55)(b) are grammatical.

A second related question is posed by cases of so called "backformations" (cf. Stiebels/Wunderlich 1992). Verbs resulting from this process show a heterogeneous and syntactically "incomplete" behaviour:

(56) (a)

verb	→	noun	→	compound	→	verb
versetzen		*Versetzung*		*Strafversetzung*		*strafversetzen*
transfer		transference		"(to) transfer for disciplinary reasons"		

(b) (*daß*) *er ihn strafversetzte*

(c) **Man versetzte ihn straf*

(d) **Man strafversetzte ihn*

(56)(b) with verb-last shows that the result of backformation is indeed a verb. (56)(c) and (d), however, illustrate that the non-head element of the nominal compound (*straf*-) behaves neither as a particle nor as a prefix in verb-second contexts.

A further exploration of these issues would go far beyond the scope of this paper. However, I argue that an explanation for nouns and adjectives derived from particle verbs can be found that is compatible with the view that particles and resultatives remain inside the SC at S-structure. The data in (49) do not provide counterexamples to this proposal.

2.2 Verbal prefixes

A different structural approach that can be adopted to analyze verbal modifiers is Borer's (1994, 1995, 1996) theory on aspect and argument structure. Borer highlights the aspectual role of the internal argument and focuses in particular on the correspondence between the syntactic notion of unaccusativity and the aspectual notion of telicity. It is a well-known fact that one and the same verb may be used as an unaccusative and as an unergative verb. Consider, for example, the Dutch sentences in (57):

(57) (a) *Peter heeft gesprongen*
Peter has jumped

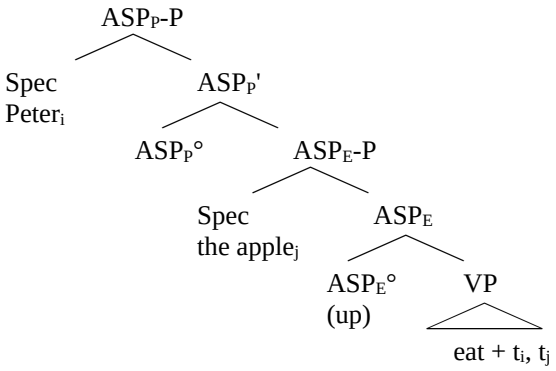
(b) *Peter is in de sloot gesprongen*
Peter is in the ditch jumped

The (a)-example shows the unergative variant of *jump* (it takes the auxiliary *hebben*). Hence, *Peter* is the agent of the jumping, the external argument of the verb. The (b)-sentence, however,

is unaccusative (the auxiliary is *zijn*), due to the presence of a directional PP. Here, *Peter* is a derived subject whose thematic properties are those of an internal argument of the verb. (57)(a) also differs from (b) with respect to its aspectual properties. While (a) is atelic, (b) includes reference to the result state of the jumping-event and is therefore telic. The external argument *Peter* in (a) is the subject of the jumping activity, whereas the internal argument *Peter* in (b) is the subject of result. At the end of the jumping, Peter is in the ditch.

Borer's theory is based on these observations. Her primary assumption is that the lexical entry of the verb is only specified with respect to the number of arguments which the verb selects. There is no particular ordering of these arguments in the VP according to lexically specified thematic properties. The interpretation of the verbal arguments and their hierarchical (and linear) order are only determined by the syntax. For this reason, the arguments of the verb have to move into the specifier positions of functional categories dominating the VP. Here they receive case, and an interpretation based on the semantic properties of these categories. In Borer's (1994, 1995) theory, there are two aspectual nodes dominating VP:

(58)



The first aspectual node, ASP_E, is responsible for telic (i.e. Accomplishment and Achievement) readings. Its head can (but does not have to) assign accusative case to an argument in its specifier. In being located in $SpecASP_E$, the argument becomes the subject of result of the event.[12] If ASP_E projects in the syntax, it also has to project a specifier. Projection of ASP_E, though, is optional. Borer (1995) assumes that particles and verbal prefixes are base-generated in the head of ASP_E. They are the overt realization of a semantically specified ASP_E-node. Hence, they always license an argument in $SpecASP_E$ and give rise to an eventive reading of the predicate.

[12] Borer (1994) makes explicit use of Tenny's terminology („measuring out“ or "delimiting"), whereas Borer (1995, 1996) avoids these notions. Her notion of "result state" is adopted from Kratzer (1995).

The second aspectual node, ASP_P, which dominates the first, can project a specifier where an argument can be interpreted as the subject of a process. A DP moved to $SpecASP_P$ has to move further up to SpecT to receive nominative case. As ASP_E, ASP_P does not have to project (but at least one of the ASP-phrases has to). The optionality of the projection of the different aspectual nodes and their specifiers gives rise to a number of different possible derivations. For example, if a verb selects only one argument, this DP can end up in the specifier of ASP_E before it moves to SpecT to receive nominative case, resulting in an unaccusative/telic reading. Alternatively, the DP can move first to the specifier of ASP_P, yielding a unergative/atelic reading. The derivation of transitive or ditransitive sentences can also be accounted for in a straightforward manner.

Adopting Borer's proposal for my concerns, I argue that verbal prefixes in German generate in a functional position above VP similiar to Borer's ASP_E-node. This node is responsible for the thematic and aspectual interpretation of direct internal arguments. The thematic interpretation of any argument located in the specifier of ASP now depends on properties of ASP°; for example on the choice of a particular prefix. The prefixes combine with the verb in overt syntax as the result of S-structural verb incorporation. This explains their phonological, morphological and syntactical properties (see section 1.1). The direct internal argument in SpecASP now receives accusative case from the verb. My approach differs from Borer's proposal, however, in that not all arguments occupy the specifier of ASP as a result of movement. Instead, I assume that some might be base-generated in this position to saturate an argument of ASP°.[13] In that case, ASP° is a predicate, and SpecASP is a theta-position. In section 2.1, however, I showed that particles and resultative predicates can also introduce internal arguments in SpecSC. These subjects of result, I argue, have to move to ASP° to receive case from the verb. In this case, ASP° is semantically empty, and SpecASP is a non-theta-position. With respect to A-moved DPs, ASP is the structural eqivalent to Chomsky's (1989, 1992, 1994) AGR-O.[14]

The claim that prefixes are located in a projection above VP stands in contrast to the assumption that they are located in the same SC-head-position as particles (a position promoted in Hoekstra/Mulder 1990; Hoekstra 1992; Steinbach/Vogel 1994; Den Dikken 1995, for example). In the following, I want to provide some arguments against the SC-view.

---

[13] Borer (1996:FN 6) also considers this as a possible alternative to her movement-approach.

[14] Under the assumption that nominative case is assigned in SpecTNS, we could now dispense with functional projections exclusively dedicated to agreement (as also pointed out by Borer 1996:FN 7). However, this raises the question of how the inflectional morphology of subject agreement attaches to the verb. For the time being, I therefore assume that AGR-S does in fact exist.

Hoekstra/Mulder (1990), for example, assume that the prefix *be-* is generated inside a SC. This prefix alternates with the lexical (adjectival) resultative *vol*, "full", in Dutch for which an SC-structure like (59) has already been motivated. The same is true for German:

(59) (a) *daß Peter den Wagen mit dem Heu belädt*
that Peter the wagon-ACC with the hay Pref-loads

(b) *daß Peter den Wagen mit dem Heu voll lädt*
that Peter the wagon-ACC with the hay full loads

As Hoekstra/Mulder (1990:19) note, the meaning of (59)(a) and (b) are "near identical". They take this similiarity as an argument for locating both the prefix and the resultative predicate inside the SC. Contrary to Hoekstra/Mulder, however, I argue that we have to assume different structural positions precisely because their meaning is only nearly and not strictly identical. As noted above, *voll* predicates over the direct argument and describes a result state of the loading-event in (59)(a) which is derived from the lexical meaning of the adjective (see also section 3.4). Hoekstra/Mulder's account implies that *be-* also defines a result state of the loading event. In the following, I want to show that this implication is not realized. Compare the two negated sentences in (60):

(60) (a) *Peter hat den Wagen nicht mit dem Heu voll geladen*
Peter has the wagon NEG with the hay full-loaded

(b) *Peter hat den Wagen nicht mit dem Heu beladen*
Peter has the wagon NEG with the hay Pref-loaded

(60)(a) is ambiguous. On the one hand, it can mean that Peter did not load any hay on the wagon, which means that the whole event has been negated. On the other hand, it can also mean that Peter actually did load hay, but that he did not fill the whole wagon. What is negated here is the result state introduced by the secondary predicate *voll*.

Now, if (60)(b) also described a result state of the loading-event, we would of course expect the same ambiguity as in (a). However, (b) is not ambiguous. It can only mean that the loading did not take place. No result state can be negated simply because it is not expressed as part of the structure. But since this is an important difference between the meaning of the prefix and the resultative, their semantic similiarity is not strong enough to provide evidence that they are both located in a SC. Notice, however, that this argument does not prove the contrary either. As shown in section 1.2, particles also do not always define a result state of the event.

Nevertheless, I assume that they are heads of SCs. Is there any evidence for the assumption that prefixes are not?

One argument in favor of this view concerns general assumptions about properties of bound morphemes and their syntactic representation. Inflectional elements like tense or agreement that are bound morphemes in German are usually located in functional positions above VP. They combine with their lexical host by incorporation of the verb into the functional head - and not the other way round. If verbal prefixes were base-generated below VP and had to move, they would be the only bound morphemes with this property, at least in German. The exceptional status of these elements remains a stipulation in the theories that generate verbal prefixes inside a SC. This shortcoming is avoided in the account I propose: Like any other bound morphemes, verbal prefixes are generated in a projection above VP and combine with the verb via verb incorporation.[15]

Another argument against a uniform syntactical treatment of particles and prefixes is empirical. The claim that prefixes and particles are base generated in the same position predicts that they can never modify the same verb. My theory, in contrast, allows that both particles and resultatives can combine with a prefixed verb. The phrase structure of German further predicts that the stranded particle precedes the prefix in the derived complex. These predictions can be checked if we look at possible iteration of verbal modifiers in German.

In a extensive study on verbal modifiers in German, Stiebels (1996:43) makes the following observations. First, iteration of particles is generally excluded.[16] Second, iteration of prefixes is possible in a few cases, but only if the first element is a P-prefix (the SC-analysis already fails to explain this option; I propose a solution below). Third, derivations with a prefix preceding a particle are very rare:

(61) (a) *beauftragen*
Pref-Prt-Verb
"instruct"

(b) *beeindrucken*
Pref-Prt-Verb
"impress"

[15] In Chomsky's (1992, 1994) Minimalist program, inflectional elements no longer are base-generated in functional positions. Instead, the verb is generated in the lexicon with all its morphological features that are checked in relevant functional projections in the course of the derivational process. As far as I can see, my argument can easily be reformulated (and possibly be made even stronger) in the Minimalist framework.

[16] The particle *mit*, "with", seems to be an exception since it can combine with almost every verb in German. Stiebels does not discuss this element.

Examples like those in (61) are no counterevidence to my approach, however: As Stiebel notes, all derivations of this kind are in fact denominilizations: The verbs in (61) are derived from the underlying nouns *Auftrag*, "instruction", and *Eindruck*, "impression". Since this process is very productive in German with nouns in general, (61) is expected.

The fourth, and most important observation of Stiebels is that the most frequent iteration in German, however, is in fact the particle-prefix-combination. This is predicted by my proposal. Some examples are given below:

(62) (a) *be-halten*
Pref-hold
"keep"

(b) *ein-be-halten*
Prt-Pref-hold
"keep back"

(63) (a) *be-zahlen*
Pref-pay
"pay for something"

(b) *aus-be-zahlen*
Prt-Pref-pay
"pay somebody"

(64) (a) *be-kommen*
Pref-come
"get"

(b) *heraus-be-kommen*
out-Pref-come
"get out"

(65) (a) *be-arbeiten*
Pref-work
"work on"

(b) *fertig be-arbeiten*
ready Pref-work
"finish working on sth."

(66) (a) *er-kennen*
Pref-know
"recognize"

(b) *ab-er-kennen*
Prt-Pref-know
"deprive of sth."

(67) (a) *er-wählen*
Pref-choose
"elect"

(b) *aus-er-wählen*
Prt-Pref-choose
"predestine"

In a theory where all verbal modifiers are located in the same syntactic position, there is no explanation for the data in (62)-(67). In the structural representation I propose, the derivation of these words is straightforward: When the verb incorporates into ASP, it combines with the prefix, while the particle or resultative element generated in the SC is left behind.

A further argument in favor of the claim that there are different base positions for particles and prefixes comes from the analysis of P-prefixes. I discuss these elements in the next section.

2.3 P-prefixes

P-prefixes (*über*, "over", *unter*, "under", *hinter*, "behind", *um*, "around", and *durch*, "through") are prepositions that behave exactly like other verbal prefixes with respect to intonation, morphology and syntax (cf. section 1.1). Consider the alternations in (68) and (69). In these examples, the P-prefix contributes the same meaning to the sentence as the head in the corresponding PPs. Therefore, Wunderlich (1987) analyzes P-prefixes as (incorporated) prepositions:

(68) (a) *Peter ist über die Stadt geflogen*
Peter is over the city-ACC flown

(b) *Peter ist durch den Fluß geschwommen*
Peter is through the river-ACC swum

(69) (a) *Peter hat die Stadt überflogen*
Peter has the city-ACC over-flown

(b) *Peter hat den Fluß durchschwommen*
Peter has the river-ACC through-swum

In section 2.1, I showed that directional PPs, such as those in (68), can function as resultative predicates of a SC-complement of the verb. Moreover, Hoekstra/Mulder (1990) claim that every verb that selects a DP argument can be transformed into a copular verb (= a verb that selects a SC with the DP as its subject). Motional verbs, such as *fliegen* and *schwimmen*, can select an external argument and receive an unergative and atelic interpretation. In (68), however, they both select a SC-complement with the directional PP as its predicative part. Their single DP-argument is realized as the subject of the SC. It raises into the subject position and receives nominative case. Hence, the motional verbs in (68) are unaccusative.[17]

The most straightforward assumption now seems to be that the PPs in (68) are SC-predicates, and that their heads have incorporated into the verb in (69). The structural properties of the P-prefixes then would follow from this assumption. Furthermore, in spite of the

[17] The Dutch and Italian translations of (68) select the auxiliaries *zijn* and *essere* in the perfect tense, whereas the atelic verbs without a PP select *hebben* and *habere*. Auxiliary selection, however, is not always a convincing test for unaccusativity in German (the verbs in (68) also select *sein* in unergative contexts). However, prenominal modification, a strong indication for unaccusativity in German (see section 1.2) is only possible with the participle plus PP:

(i) *Der über die Stadt geflogene Pilot*
The over-the-city-flown pilot

(ii) **Der geflogene Pilot*

The same holds for Dutch (cf. Hoekstra/Mulder 1990:4).

unaccusative properties of the basic verb, the derived verb is now able to assign accusative case because of the respective properties of the preposition. Accordingly, the derived verbs in (69) are transitive and select the auxiliary *haben* in the present perfect.

So far, the incorporation analysis only accounts for cases like (69) where the meaning of the P-prefixes is the same as the meaning of the preposition. It does not, however, account for derived verbs as in (70):

(70) (a) *Peter hat den Wagen überladen*
Peter has the wagon over-loaded

(b) *Peter hat den Gegner unterschätzt*
Peter has the opponent under-estimated

Although the P-prefixes in (70) still have their basic prepositional meaning (Peter loads the wagon, but *over* its limit; he assesses his opponent, but *under* his actual abilities), they do not have a PP-counterpart like the P-prefixes in (69).

Some elements that can become P-prefixes can also appear as postpositions, and consequently do not leave the SC. Compare (71)(a) and (b):

(71) (a) *Peter überspringt den Graben*
Peter Pref-jumps the ditch
"Peter jumps over the ditch"

(b) *Peter wirft sich eine Decke über*
Peter throw Refl.-DAT the blanket-ACC over
"Peter lays a blanket over himself"

The verbs *laden* and *springen* in (71)(a) and (b) can both combine with *über*. But the resulting complex verbs *über'springen* and '*überwerfen* differ in all the respects that distinguish prefixes from heads inside the SC. For example, (71)(a) shows that the prefix cannot be separated from the stem whereas the postposition in (b) must be stranded.

There are even cases where one and the same verb can be modified by a preposition which is interpreted either as a particle or as a prefix. The result are two derived verbs with different meanings. Consider the two verbs *umfahren* (verbal modifier + *fahren*, "drive") in (72):

(72) (a) *etwas um'fahren* (= P-prefix)
"drive around something"

(b) *etwas 'umfahren* (= particle)
"run something down"

Whereas the prefix *um* has kept its original prepositional meaning, it has acquired a different and idiosyncratic meaning when it is used as a particle (cf. Wunderlich 1993).

Keyser/Roeper (1995) show that similiar cases appear also in English:

(73) (a) *pass by the pornographic ad*

(b) *bypass the pornographic ad*

Keyser/Roeper note that (73)(a) and (b) have different meanings. They analyze the preposition *by* in (73)(a) as a SC-complement of the verb (note that it follows the verb because English is SVO). It modifies the "result" or the "style" of the verb. However, the preposition can (optionally) move into a higher position to the left of the verb to derive (73)(b). According to Keyser/Roeper, this prefix position is responsible for the meaning change of the derived verb, where the prefix now specifies the "inherent style" of the verb.

My account for the analysis of P-prefixes is in accordance with the basic idea underlying Keyser/Roeper's proposal. Whereas the particle/prepositional/postpositional elements in (68)-(73) are located in a SC-complement of the verb, P-prefixes that change the meaning of the sentence, such as those in (70), are associated with a higher prefix position above the verb. This position is ASP° in my proposal, the base position of prefixes such as *be-* and *ver-* etc. (note that also in Keyser/Roeper's theory, other prefixes such as *re-* can occupy the prefix position). Although it might be possible that the verbs in (69) are in fact derived by S-structural preposition incorporation into the verb, the derivation of verbs like those (70) involves the head of ASP.

Remember that the phonological, morphological and syntactical properties of prefixes differ from those of particles and resultatives, which follows directly from my proposal to locate prefixes in ASP°. If prefixes and particles were both located inside a SC, one would have to assume that prefixes have to incorporate into the verb at S-structure to account for the structural differences illustrated in section 1.1. According to this view, the necessity of S-structural incorporation of prefixes (which is still not possible for particles) might then be explained by taking the morphological boundedness of verbal prefixes into account. They have to combine with the verb to satisfy their m-selectional requirements before PF. But this line of reasoning does not apply to P-prefixes since they are free morphemes. How then can we explain

why *über* can combine with the verb as the head of a resultative PP in (71)(a), but not as the head of a resultative PostP in (71)(b)? How can we account for the difference between (72)(a) and (b)? Why does the preposition *um* have to incorporate into the verb in (72)(a), but not the particle *um* in (72)(b)?

One response to these questions would be to assume that the prepositional meaning is actually the *result* of incorporating the verbal modifier, i.e. that it forces the preposition to move, since it otherwise receives an idiosyncratic particle meaning. But now (68) and (71)(b) are clearly counterarguments, for the elements that remain in the SC nevertheless retain their prepositional meaning. Furthermore, how could we explain (70)? It seems that the data in (68)-(73) can only be accounted for if we asume that there are two different positions that are associated with prefixes and particles. This is exactly the conclusion drawn by Keyser/Roeper (1995:26). With respect to the controversy whether complex verbs should be analyzed by adopting a SC- or a prefix-structure, Keyser/Roeper (1995:26) argue that "both the SC-analysis and the Prefix+V analysis are correct".

In sum, I assume that there are certain cases of preposition incorporation such as those in (69), whereas cases like those in (70) involve the activation of ASP°. This means that the verb combines with the P-prefix in ASP° and the internal argument is selected by the verb+preposition. The interpretation of the direct object therefore depends on aspects of both ASP° and the preposition:

(74) (a) *Peter belädt den Wagen*
Peter Pref-loads the wagon

(b) *Peter überlädt den Wagen*
Peter overloads the wagon

The object *der Wagen* in (74)(a) usually receives an interpretation as "totally affected", i.e. the whole wagon is loaded. (74)(b) adds the interpretation of the preposition, yielding an interpretation of the wagon being "too much affected" by the loading.

However, in the absence of a convincing answer at this point, I have to leave open the question of how P-prefixes such as *über* in (74)(b) end up in ASP°. The easiest answer would be to assume that they are simply base-generated in this position. However, as noted in section 2.2, they can iterate with other prefixes that are also located in this position, and thus the base-generating-approach does not look very attractive. An alternative approach to P-prefixes might be based on the assumption that even P-prefixes as in (70) are generated as heads of an

(abstract) underlying PP located in a SC[18], and that they incorporate into ASP°. In order to make this incorporation process possible, the whole PP would have to leave the SC before incorporation of its head can occur. A possible landing site for PP-movement is SpecASP. If the prefix incorporates into ASP (cf. Den Dikken (1995) who deals with cases of head movement out of A-moved PPs), it allows for accusative assignment to the PP in SpecASP which shares these case features with the argument in SpecSC. (Hoekstra/Mulder (1990) suggest this mechanism for cases of locative inversion in English: the locative PP leaves the SC and moves to SpecIP, nominative case is assigned to the PP and then through its trace to its stranded subject in SpecSC.) If the verb moves to ASP, it combines with the P-prefix and incorporates both aspectual and prepositional properties of this position.

There is another observation that has to be taken into account. It seems that P-prefixed verbs have a corresponding PP-alternant only if the basic verb is motional (cf. (68) and (69)). The basic verbs are unaccusative, i.e. the subjects of the sentences in (69) are generated inside the SC. Accusative is assigned to the *internal* argument of the preposition after PI. In the case of non-motional verbs, however, it is the direct object that is generated in SpecSC, i.e. the *external* argument of the preposition, that has to receive accusative case. This structural difference seems to be responsible for the two different derivations of P-prefixed verbs.

These are only tentative suggestions about the derivation of P-prefixed verbs and are far from being sufficiently elaborated. My basic concern was to show that an adequate analysis of P-prefixes involves the postulation of different positions for prefixes and particles, thereby providing another argument in favor of ASP. However, since the exact mechanism by which ASP participates in the derivation of P-prefixed verbs is not yet clear to me, I ignore P-prefixes in the remainder of this paper.

3. Verbal modifiers and thematic properties

In this section I will argue that the semantic function of prefixes, particles and resultative constructions is to introduce individual-type arguments that become the internal argument of the derived verb. The lexical entry of the verb does not include any information about these arguments. I will focus primarily on prefixed verbs that are derived from unprefixed verbs. In

[18] The abstract PP underlying the verb in (74)(b) would have to have the object as its external argument in SpecSC and no overtly realized internal argument. It might be interpreted as "the wagon [$_{PP}$ over (its limit)] load".

German (and Dutch), there is also a large number of prefixed verbs that are derived from adjectives or nouns, cf.:

(75)	(a)	*verarmen* Pref-poor	-	"to become poor"
	(b)	*beflaggen* Pref-flag	-	"to flag"

I refer the reader to Wunderlich (1987), Mulder (1992); Neeleman/Schipper (1992); Lieber/Baayen (1993); Den Dikken (1995); and Stiebels (1996), for the discussion of verbs like (75)(a) and (b).

3.1 A "neo-Davidsonian" syntax

Traditionally, the thematic properties of a verb (i.e. the number and the kind of argument it selects) are considered to be part of its lexical entry. In the framework of event-semantics developed by Donald Davidson (1968), a verb like *buy* takes two nominal arguments of type e. Furthermore, it selects the event argument of type s:[19]

(76) buy* = $\lambda x_e \lambda y_e \lambda e_s$[buy (x)(y)(e)]

In (76), the arguments associated with the verb are amalgamated into the predicate. However, in Parsons (1990), for example, a different view is adopted: The arguments of *buy* are introduced by different predicates that denote the particular thematic relation between the event and the arguments. Dowty (1989) refers to this alternative as the neo-Davidsonian policy:

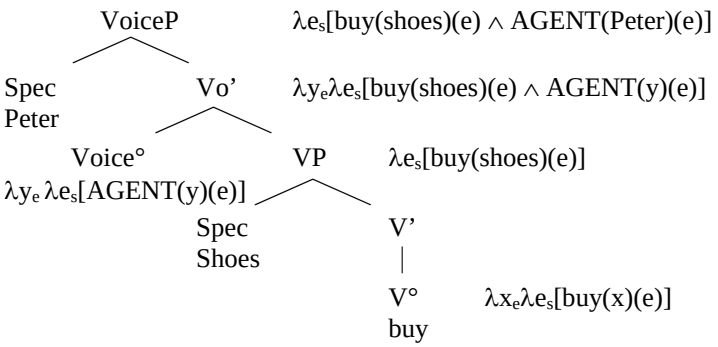
(77) buy* = $\lambda x_e \lambda y_e \lambda e_s$[buy(e) $\wedge$ THEME(x)(e) $\wedge$ AGENT(y)(e)]

In defending the neo-Davidsonian approach, Parsons (1995) emphasizes that the notion of thematic relation that underlies the logical form in (77) is a semantic one and does not imply any commitments about the syntactic representation of thematic roles. However, in recent

[19] In neo-Davidsonian theories, the event argument is represented by the variable e that stands for eventualities of the three situation types: Activity; Achievement and Accomplishment. States are represented by the s-variable (cf. Parsons 1990, Kratzer 1994).

studies on the interface between syntax and lexical semantics, the idea of severing the arguments from the verb has also been implemented in the syntactic representation of the sentence. In Kratzer (1994, 1995), for example, the Agent predicate is the head of functional projection "Voice":

(78)



In (78), both the VP and the Voice-Head are predicates: Voice takes an event-type and an individual-type argument; the VP only denotes properties of events. The combination of these two predicates is possible via the process of Event-Identification (cf. Kratzer 1994, 1995)[20]:

(79) Event-Identification:

f	g	→	h
<e,<s,t>>	<s,t>		<e,<s,t>>

$\lambda x \lambda e[f(x)(e) \wedge g(e)]$

In Kratzer's theory, only the Theme is syntactically associated with the verb. Its so-called external argument is severed from the verb; the introduction of the Agent of the event depends on properties of Voice° alone. If the VP expresses a property of states, it cannot combine with an Agent in Voice° (because the predicates take different event-type arguments and Event-Identification cannot apply in this case). Hence Voice has to host a "Holder"-predicate which expresses the "In-ness"-relation (in Parsons' (1995) terms) between a state and its external argument. This predicate can combine with the stative VP (Event-Identification is also defined for functions that both take stative event-type arguments). It follows immediately from this theory that only eventive predicates can take agentive subjects.

The idea to associate also the internal argument with an independent functional category has been formulated in Jelinek (1995), for example. Jelinek points out that in Strait

[20] Parsons (1995) suggests a similiar compositional tool that he calls "lambda conjunction".

Salish, transitivization of any sort of intransitive root is a very productive process. By adding a transitive suffix (/-t/, /-s/, /-n/ or /-n x°/) to the verb stem, an internal argument is introduced. Consider the data from Samish (a dialect of Strait Salish) in (80), taken from Galloway (1990):

(80) (a) /λx°-ut/ = spit (something) out: affects object as a whole
(b) /λ 'x°-n/ = spit (at someone): affects object partially

The intransitive root is transitivized by a final element that also influences the interpretation of the direct object (that has to be added to the derived verb as a clitical pronoun). To account for this phenomenon, Jelinek argues that a transitive functional head exists in the clause structure that is associated with certain aspectual features of the predicate. She notes that "Salish provides evidence that we need both Transitive and Voice as functional heads, since both occur overtly in the Salish clause" (Jelinek 1995:494).

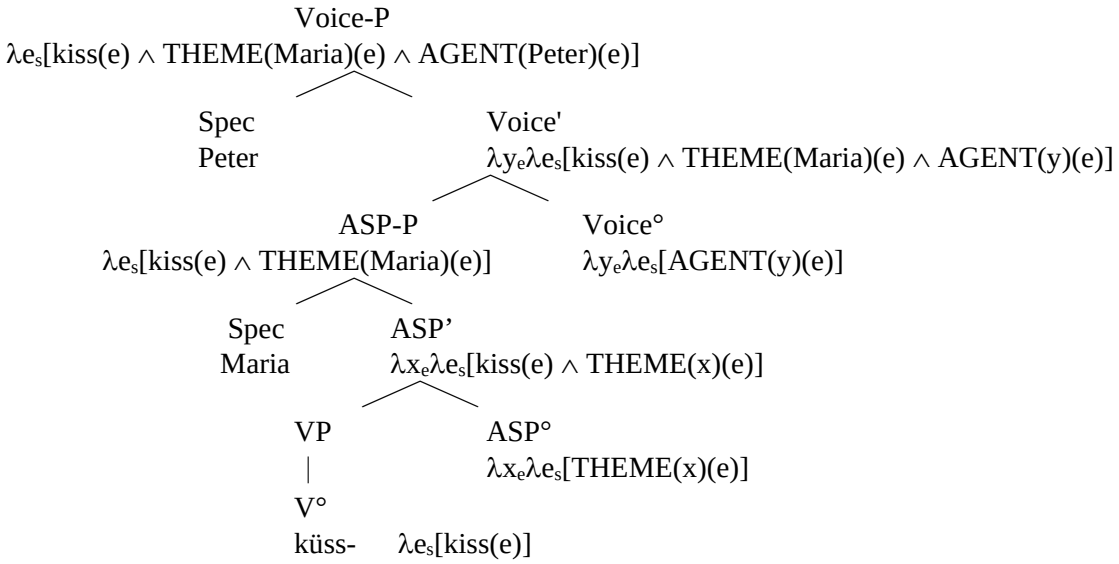
I suggest that the aspectual node ASP that I discussed in the preceding sections is in fact the syntactic realization of a transitivizer node like the one suggested by Jelinek for Strait Salish. The meaning associated with the syntactic head of ASP is similiar to the meaning of Voice in that it expresses a thematic relation between the event and an individual. Voice introduces the external argument, anad accordingly, ASP introduces the internal Theme-argument:

(81) (a) Voice°: Agent* = $\lambda y_e \lambda e_s$[AGENT(y)(e)]
(b) ASP°: Theme* = $\lambda x_e \lambda e_s$[THEME(x)(e)]

The VP is a predicate over events, and combines with the Theme by Event-Identification. The derivation of the transitive sentence in (82) looks like (83):

(82) *Peter küßt Maria*
Peter kisses Maria

(83)



The structural representation in (83) deviates from the traditional view that the arguments of the verb have to be base generated inside VP. As a consequence of θ-theory (cf. Chomsky 1981, 1986), which is concerned with the mapping of the verb's arguments to particular syntactic positions, it has been assumed that the VP represents the thematic properties of the verb at D-structure (cf. e.g. Ouhalla 1991). Hence, all arguments are generated inside VP. However, in most theories, the DP-arguments have to leave their base positions inside VP and move to specifiers of functional projections above VP (cf. Chomsky 1989, 1992, 1994; Johnson 1991; Borer 1996). In contrast, the structure in (83) is the syntactic mirror of the neo-Davidsonian framework. The thematic roles of a verb are independent predicates and are not lexically associated with it. The verb itself is the basic predicate of events. Therefore, arguments are not base generated inside VP. If the verb is transitive, it combines first with the Theme predicate in ASP° whose argument gets saturated by a DP in SpecASP. Then it combines with the Agent-predicate in Voice.

This proposal has an important consequence: Since both the internal and the external argument are severed from the verb in the syntax, all verbs only express properties of events. Their lexical entries include aspectual information about the events they express, but no direct information about the event participants. As I suggested in the preceding sections, verbal prefixes in German are generated in ASP°. Therefore, they introduce an internal argument and provide specific information about the relation between the individual denoted by this argument and the event denoted by the verb.

3.2 Meanings of thematic relations: an illustration

Parsons (1995) emphasizes that thematic predicates such as Theme and Agent denote relations between individuals and events, and not properties of individuals. He points out, "that a sentence entails that someone is an Agent does not necessarily make the person an Agent of the event specified by the verb of the sentence" (1995:641). Hence, if "Theme" stands for a particular relation between an individual and an event, how would this relation be classified? Parsons (1995) gives a rather simple answer to this question: If a theme relation holds between an event e and an individual x, then "e is of x".

A more explicit statement is made by Dowty (1991). Dowty's theory is based on the assumption that grammar has to recognize two thematic proto-roles, a Proto-Agent and a Proto-Patient, each of which is characterized by a list of verbal entailments. These entailments are properties of agenthood and patienthood. For example, volitional involvement in the event or state typically characterizes the agent-relation; to undergo a change of state in the course of an event is associated with a Patient[21]. Dowty's view makes it possible to subsume semantically different arguments under one thematic relation. His "Argument Selection Principle" guarantees that "the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object" (1991:641).

Like Dowty, I assume that thematic roles like Agent, Theme or Holder are prototypes. Hence, the traditional thematic notions can be decomposed into different entailments. As has been argued by Davis/Demirdache (1995) and van Hout (1996) (amongst others), the exact kind of interpretation that is associated with the argument introduced by these predicates depends highly on the aspectual properties of the (event expressed by the) verb (its "event structure" in the sense of Pustejovsky 1988, 1991). Van Hout (1996), for example, emphasizes that Agentivity has to be taken as an underspecified notion which is filled in by the event-type of a particular verb. The same is true for the Theme. The syntactic configuration tells us that the subject of a sentence is an Agent and that the object is a Theme. The semantics of the verb defines what kind of event it describes and what sort of Agent or Theme-interpretation these arguments receive. For example, a verb like *push* tells us that a Theme has to be interpreted as

[21] In the following, I use the terms "Patient" and "Theme" to refer to the same thematic relation.

"causally affected by another participant", whereas the Theme of a verb like *build* has to be an "Incremental Theme" (both properties are listed under the Patient proto-role in Dowty (1991)).

Notice that, although "Agent" and "Theme" are rather unspecific coverterms, specific verb-dependent proto-properties can be formulated in a more explicit way: Krifka (1989, 1992), for example, defines the "Gradual Patient"- (= Incremental Theme-) role in terms of the following meaning postulates:

(84) (a) Graduality:

$\forall R[GRAD(R) \leftrightarrow UNI\text{-}O(R) \wedge MAP\text{-}O(R) \wedge MAP\text{-}E(R)]$

(b) Uniqueness of objects:

$\forall R[UNI\text{-}O(R) \leftrightarrow \forall e, x, x'[R(x)(e) \wedge R(x')(e) \rightarrow x = x']]$

(c) Mapping of objects:

$\forall R[MAP\text{-}O(R) \leftrightarrow \forall e, e', x[R(x)(e) \wedge e' \subseteq e \rightarrow \exists x'[x' \subseteq x \wedge R(x)(e')]]]$

(d) Mapping of events:

$\forall R[MAP\text{-}E(R) \leftrightarrow \forall e, x, x'[R(x)(e) \wedge x' \subseteq x \rightarrow \exists e'[e' \subseteq e \wedge R(x)(e')]]]$

A Theme-argument is an Incremental Theme if its relation to the event is gradual. Graduality is defined as a second-order predicate over (thematic) relations. A thematic relation is gradual if the object is subjected to the event in an incremental manner, i.e. if the three conditions in (84)(b)-(d) are fulfilled. Uniqueness of objects guarantees that the event is related to a specific object and to nothing else. Mapping to objects and mapping to events say that every part of the event corresponds to one part of the object and vice versa. Whether or not the Theme-relation between an event and an individual is gradual depends on the semantic properties of the verb alone, i.e. on the kind of event that is expressed by the verb.

So far, I have assumed that the direct argument of a transitive unprefixed verb is introduced by a predicate in ASP that describes a relation between an event and an individual. The meaning of prefixes now is defined along the same lines: Verbal prefixes introduce internal arguments. The prefix located in the ASP-position establishes the relationship between the argument in SpecASP and the event expressed by the verb, i.e. it defines the thematic interpretation of the internal argument.[22] But, whereas this relationship is underspecified in the

[22] This idea is similiar to the proposals of Booij/van Haaften (1988) and Neeleman/Schipper (1992) who argue that a prefix provides a Theme when it attaches to the verb. However, Neeleman/Schipper's theory of θ-role percolation allows for the θ-role of the prefix to remain unrepresented if it combines with a transitive verb that transmits its basic Theme-θ-role to the derived verb. Since verbs do not select "basic" internal arguments in my

case of a morphologically empty Theme-ASP-head as in (83), the meaning of a particular prefix can make this relationship more specific. That means that all prefix-meanings should be considered part of the (extended) Proto-patient list. Of course, the meaning of the prefix restricts the number of possible verbs that can combine with the prefix (see Stiebels 1996 for a detailed investigation of how semantic properties of the verb constrain the use of a structurally possible verbal modifier). Furthermore, when a prefix combines with a verb, it can yield an interpretation that differs from the one associated with the internal argument of the unprefixed verb. This explains why the unprefixed verb and the derived verb often show different selectional restrictions, cf.:

(85)	(a)	*Peter malt ein Bild* Peter paints a picture	(b)	*Peter bemalt den Tisch* Peter Prt-paints the table "Peter paints the table/ covers the table with paint"
(86)	(a)	*Peter stellt das Bild auf den Tisch* Peter puts the picture on the table	(b)	*Peter verstellt die Einfahrt* (*mit dem Auto*) Peter Pref-put the driveway (with the car) "Peter blocks the driveway (with the car)"

Both the simple verb and the prefixed verb select internal arguments, but the thematic properties of these arguments are clearly not the same.[23] The change in selectional requirements must be due to the meaning of the prefix. In the following, I will discuss some proposals about meanings of verbal prefixes.

Let me start with the prefix *be-* (cf. Günther 1974 for extensive discussion). Lieber/Baayen (1993) analyze the Dutch prefix *be-* (which is very similiar to its German variant) in the theory of lexical semantics developed by Jackendoff (1990). In Jackendoff's framework, verbal meanings are represented as Lexical Conceptual Structures (LCS). They consist of semantic primitives, i.e. predicates such as CAUSE (causative), INCH (inchoative) or BE (stative). AT_d means to be "located completely at" which represents the "holistic" or

proposal, it comes closer to Booij/van Haaften's claim that verbal prefixes always create internal arguments that are not related to the argument structure of the base.

[23] Notice that the objects in (85) differ although both are Incremental Themes: The thematic relation between *ein Bild* and the painting event in (a) is gradual (see (84) above), but also satisfies "uniqueness of events". This says that that there is only one event related to the object by the thematic relation, i.e. for a specific picture, there is only one painting event (cf. Krifka 1989). This is not a property of the relation between the table and the painting in (b), since a specific table can be covered with paint more than once.

"totally affected" interpretation the object that is often associated with *be*-verbs. Lieber/Baayen propose the following LCS for *be-*:

(87) $[_{\text{Event}}\text{CAUSE}([_{\text{Thing}}\ \_\ ],\ [_{\text{Event}}\text{INCH}[_{\text{State}}\text{BE}([_{\text{Property, Thing, Event}}\ \_\ ],\ [_{\text{Place}}\text{AT}_{\text{d}}([_{\text{Thing}}\ \_\ ])])]])]$

The empty slots in the LCS correspond to (syntactic) arguments. If two LCSs combine, the derived word is their amalgam. (87) means that something causes the change of state of an individual, a property or an event (this is how Lieber/Baayen assure that *be-* can combine with nouns and adjectives as well as with verbs). If *be-* combines with *malen*, "to paint", for example, the meaning of the derived verb *bemalen* is "to cause the act of painting something to be located completely at a place". According to Lieber/Baayen, this is a metaphorical description for "to cover with paint".

The causative part of the LCS is associated with the Agent of the event. Hence, in my account, it is a property of Voice and is not associated with ASP. Formulating the remaining part of Lieber/Baayen's proposal as a meaning associated with ASP°, we derive (88):

(88) $\lambda P_{<s,t>}\lambda x_{e}\lambda e_{s}\exists e'_{s}[P(e') \wedge \text{LOCATE\_AT}_{\text{d}}(x)(e')(e)]$

According to (88), *be-* is not a predicate, but is rather associated with an operator-like meaning. It takes eventive predicates as its input and yields events that are such that they locate the basic event at the place described by the internal argument.

One objection against (88), however, concerns the relation between the event described by the basic verb and the event described by the *be*-verb. According to Lieber/Baayen's approach, these are essentially different events. For example, *bemalen* means to "locate a painting-event at some place", i.e. e in (88) ranges over locating-events and not over painting-events (the similiarity between these kinds of events is only a metaphorical and thus pragmatic implication of (88)). What is lost in this proposal is the close semantic relationship between the basic and the derived event: both *malen* and *bemalen* describe painting-events. They only differ in the interpretation of the event participant described by the internal argument.

Note that some prefixes in fact derive verbs that do not express instances of the underlying event. Consequently, they cannot be expressed by a predicate, and an analysis in the spirit of (88) suggests itself. (However, I argue that even in these cases, the prefix introduces the direct object of the sentence.) Consider (89):

(89) (a) *färben* = dye, color (something)

(b) *entfärben* = remove the color (from something)

The verb in (89)(b) expresses no instance of the original event described by *färben*. To account for this derivation, I propose the following representation for the reversative meaning of the prefix *ent-*:[24]

(90) *ent-** =

$\lambda P_{<s,t>}\lambda x_e\lambda e_s\, \exists e'_s \exists s_s[P(e') \wedge f_{result}(e') = s \wedge \text{BECOME}(\neg\, \text{HOLDER}(x)(s))(e)]$

If it combines with *färben*, the resulting verb describes a property of events that cause the individual to not be the Holder of the result state described by *färben*:

(91) *entfärben** =

$\lambda x_e\lambda e_s\, \exists e'_s \exists s_s[\text{dye}(e') \wedge f_{result}(e') = s \wedge \text{BECOME}(\neg\, \text{HOLDER}(x)(s))(e)]$

But as far as I can see, all *be*-verbs express instances of the basic event. Therefore, an analysis of *be*-verbs as proposed by Lieber/Baayen is at least problematic in this respect. Further problems with this approach are pointed out by Stiebels (1996).

Wunderlich (1987) takes the semantic similiarities between (92)(a) and (b) (an instance of the locative alternation) as his starting point:

(92) (a) *Peter malt Blumen auf den Tisch*
Peter paints flowers-ACC on the table

(b) *Peter bemalt den Tisch mit Blumen*
Peter Prt-paints the table with flowers
"Peter paints flowers on the table"

In Wunderlich's approach, verbs are lexically associated with all possible arguments. The prefix *be-* triggers a lexical rule that takes verbs with a Theme and a locative argument as its input and yields verbs which select the former locative argument as their Theme. The former

[24] Notice that (90), as it stands, presupposes the existence of a basic event whose result state is canceled by *ent-*. This assumption is not unproblematic with respect to verbs like *entfärben*; cf. also Stiebels 1996.

Theme can be realized as a PP. The basic function of the prefix *be-*, according to Wunderlich, is to shift the syntactic realization of a locative argument, similiar to the Passive rule that makes it possible to realize an internal argument as the subject of a sentence.

These facts lead Wunderlich to the assumption that the *be*-prefix is historically derived from a P-prefix, i.e. *be-* is an incorporated preposition. He argues that "Proto-German had a P-prefix rule similiar to the rule which is still productive with the restricted set of prepositions...The rule of modern German which forms *be*-prefix verbs productively is possibly born out of a lexical reanalysis and not identical to the former P-prefix rule" (1987:309). Remember that I proposed in section 2.3 a tentative derivation of P-prefix verbs that involved incorporation of a preposition into ASP. This process historically might have led to a base-generation of *be-* in ASP. Wunderlich argues that the meaning of *be-* is still that of a preposition, namely *bei*, "at". He furthermore assumes that the prefix does not select an external argument.

It follows from the reanalysis approach that the internal argument of a *be*-verb does not always receive only a locative interpretation. In fact, Wunderlich notes that the locative argument can be reinterpreted as a Theme when realized as the direct object of a *be*-verb. It can be understood as the "affected" object. Reformulating Wunderlich's lexical suggestion in the proposed framework of event semantics, the meaning of *be-* might be formulated as in (93):

(93) *be-** = $\lambda x_e \lambda e_s [BEI^*_1(x)(e) \wedge AFFECTED\_BY(x)(e)]$

According to Wunderlich, $BEI^*_1(x)(e)$ represents a topological local proximity, the event takes place "at" something. This parallels Lieber/Baayen's proposal, but avoids the drawback mentioned above.

The objects of *be*-verbs are often Incremental Themes. One might therefore assume that the AFFECTED_BY-relation can be further specified by the secondary predicate GRAD(R) (see (84)). For example, *den Tisch bemalen*, "paint (on) the table", means that the table is *gradually* affected by the painting. Furthermore, the painting is "at" the table, which excludes the possibility that *den Tisch* receives the same interpretation as the internal argument of the unprefixed verb *malen*. But notice that not every argument introduced by the prefix *be-* is an Incremental Theme, cf.:

(94) *Peter bewirft den Schneemann mit Steinen*
"Peter throws stones at the snowman"

Although the internal argument in (94) is affected by the throwing and the event takes place in the local proximity of the snowman, the relation between the two is not gradual. The investigation and formalization of the affectedness-relation still remains an open question.[25]

Let me briefly consider the prefixes *ver-* and *er-* which are ambiguous in German:[26]

(95) (a) *etwas verarbeiten* = to use something up in working with it

(b) *etwas erarbeiten* = to achieve something as a result of working

Stiebels (1996) gives the following logical forms for the prefixes in (95):

(96) (a) *ver-** = $\lambda x_e \lambda e_s$[CONSUME(x)(e)]

(b) CONSUME(x)(e) is true iff the quantitiy denoted by x becomes reduced completely and monotonely in T(e) (T(e) = event time of e)

(cf. Stiebels 1996:138)

(97) *er-** = $\lambda x_e \lambda e_s$[BECOME($POSS_p$(x))(e)]

(cf. Stiebels 1996:128)[27]

The semantics of the derived predicates in (95) look like (98):

(98) (a) *das Material verarbeiten** = $\lambda x_e \lambda e_s$[work(e) $\wedge$ CONSUME(the material)(e)]

(b) *ein Ergebnis erarbeiten** = $\lambda x_e \lambda e_s$[work(e) $\wedge$ BECOME($POSS_p$(the result))(e)]

---

[25] As noted in FN 23, the thematic relation expressed by verbs such as *paint* and *write* is not only gradual, but also has the property of "uniqueness of events". Interestingly, if these verbs are modified with *be-* in German, the internal argument remains an Incremental Theme, but without the "uniqueness of events"-property. Further investigation is needed to establish whether this observation may shed light on the meaning of *be-*.

[26] Lieber/Baayen (1993) try to capture all verbs derived by the prefixes *ver-*, *be-*, and *ont-* in Dutch by assuming one single lexical entry for each prefix. However, in this account, many verbs can only be explained by assuming a metaphorical extension of the basic meaning of the prefix which renders the idea of a single lexical entry rather implausible. The claim that prefixes like *ver-* and *er-* are ambiguous in German gets further support from the observation that they are historically derived from more than one different preposition (cf. Stiebels 1996).

[27] I have modified Stiebels proposal for *er-* such that possessor-variable is not part of the lexical entry (derived *er*-verbs do not presuppose that the Agent ends up as the possessor). Stiebels points out that a wide range of different conceptual interpretations can be subsumed under the Possessor-relation. $POSS_p$ indicates that the relation is parametrized with respect to a conceptual level.

(98)(a) describes events in which some material is consumed in working; (98)(b) expresses events of working that derive a result. Both complex events are derived via Event-Identification.

If prefixes describe predicates and combine with the verb, they can be analyzed as subevents of the complex event expressed by the derived verb. This view is thus similiar to theories of event type composition and complex predicate formation (cf. Pustejovsky 1991; van Hout 1996) to which I return in the following section.

3.3 Transitive and intransitve verbs

In the preceding sections I suggested that arguments are separated from the verb in the syntax. They are associated with a SC or the functional heads Voice and ASP dominating VP. This leads to the following important questions:

(i) What is the representation of intransitive verbs?
(ii) What restricts the transitivization of verbs?
(iii) Why can some verbs not be used intransitively?

Let me start by answering (i). With intransitive verbs, there is no thematic predicate locacted in ASP and no subject of result generated in a SC. Hence, there is no internal argument that combines with the event-interpretation given by the verb. The logical form of a verb which is usually analyzed as transitive, but is used intransitively, does not differ from the representation of a "real" intransitive verb:

(99) (a) *John laugh-* = λe_s[laugh(e) $\wedge$ AGENT(John)(e)]
(b) *John eat-* = λe_s[eat(e) $\wedge$ AGENT(John)(e)]

There is an alternative way to represent transitive verbs intransitively (cf. Dowty 1989). Suppose that the lexical meaning of a verb like *eat* is represented as in (100):

(100) *eat** = $\lambda x_e \lambda y_e \lambda e_s$[eat(x)(y)(e)]

According to the function expressed by (100), *eat* always has to take two individual-type arguments to receive an interpretation. If one argument is missing, its place in the representation has to be existentially quantified:

(101) *John eat-* = $\lambda e_s \exists x_e [eat(x)(John)(e)]$

This "implicit 'something' analysis" (Parsons 1995:649) builds into the logical form some more general knowledge shared by language users: (101) expresses the fact that, if someone eats, something is eaten. However, as Parsons points out, this analysis sometimes yields the wrong results. For example, a representation like (101) for intransitive *stab* in *She stabbed, but she missed*, would falsely predict that "something" is stabbed (which is explicitly denied by the following sentence). Nonetheless, one might still argue that the syntactic and semantic dissociation of verbs like *eat* and *build* from their arguments is at variance with our intuitions about the meaning of these verbs. On the one hand, we know that there has to be an object that is consumed when eating takes place, and that there has to be something that is constructed in the course of a building. On the other hand, however, it is by no means self-evident that we have to establish a direct relation between a DP and a verb in the grammar only because we know that the object denoted by the DP and the event denoted by the verb stand in a particular relation to each other in the world. Of course, we know that if there is an eating event going on, something is eaten. But if there is a laughing event, we also presuppose that there is something or someone that is laughed about. But we do not have to associate this knowledge linguistically with the meaning of the verb *laugh*. Parsons (1995:659) emphasizes that specifying generalizations about well-known necessary truths (such as "In every eating event, something is eaten") is "an enterprise in metaphysics, not in linguistics".

Dowty (1989), who is well aware of this point, gives another example. The events described by the verbs *eat*, *dine*, and *devour* all require that something is eaten. But only *devour* must realize an internal argument, whereas *eat* can appear with or without an object, and *dine* does not have any transitive use at all.[28] This example shows that our perception of things going on in the world tells us nothing about the grammatical properties of the verbs used to describe these events.

[28] Note that the German word for *devour*, *verzehren*, is modified with a verbal prefix which is in accordance with my hypothesis that prefixes introduce (obligatory) arguments. Intransitive verbs such as *speisen* or *dinieren* ("dine") seem to be derived from nouns. This might be a reason for their restricted behavior.

Let me turn to (ii). We know that there are verbs that do not come with an internal argument. For argument-based theories, this is not a problem: We simply stipulate that the lexical entry of these verbs is only specified for one argument. But if the introduction of a Theme argument is a productive process which is structurally available for every verb which moves to ASP, we have to explain why some verbs cannot take internal arguments. What mechanism guarantees that there is no Theme-predicate in ASP with intransitive verbs such as *laugh* or *work*?

Consider a quite radical answer. Suppose there is no such mechanism. If there is a Theme predicate in ASP that introduces an internal argument for an intransitive verb, the sentence receives the interpretation that the event is "of something". This is the result of the assumption that the syntactic positions ASP and Voice are associated with particular semantic (Proto-)properties. The interpretation of a transitive sentence is such that the subject is the Agent and the object is the Theme, and these notions have to be filled by the semantic properties of the verb. The resulting interpretation is only acceptable to the degree that there is some plausible link between the event described by the verb and the participants introduced by the thematic predicates. If this link cannot be established, the interpretation becomes deviant (see Borer 1994, 1996; van Hout 1996 for a similiar view). Consider an example:

(102) **Peter lachte den Mann*
Peter laughed the man-ACC

Of course, (102) is odd. But why? Is it because *lachen* is intransitive, i.e. because it can only take one argument? Notice that a typical transitive verb can also yield a bad result if it does not combine with the "right" object:

(103) **Peter schrieb den Mann*
Peter wrote the man-ACC

(103) is as bad as (102), and I argue, for the same reason. A DP like *den Mann* cannot receive any reasonable interpretation as the Theme of a writing- or a laughing-event. Of course, a laughing can be "about the man", but this is not the thematic relation expressed by a Theme. That "a man" is the reason for Peter's laughter is not sufficient to define him as a Proto-Patient in Dowty's terms. But now, in contrast, consider the sentences in (104):

(104) (a) *Peter lachte Bröckchen*
Peter laughed bits-ACC

(b) *Peter lachte ein freudloses Lachen*
Peter laughed a mirthless laugh-ACC

(c) *Peter verlachte Hans*
Peter Pref-laughed Hans-ACC
"Peter laughed at/belittled Hans"

In (104)(a), we have unprefixed *lachen* with a direct object. Suppose somebody tells a joke while Peter is eating a donut. With his mouth full, he suddenly bursts into laughter, thereby spiting parts of the donut all over the place. In this context, a sentence like (104)(a) becomes acceptable and could be understood as a creative expression that captures the effects of the laughter.[29] The pieces produced by Peter's laughing have a Proto-Patient property: they do not exist independently of the event described by the verb (cf. Dowty 1991:572), at least not in the relevant sense. Hence, *Bröckchen* in (104)(a) can function as the argument of the Theme-predicate, i.e. as the internal object of the verb *lachen*. In (b), we have transitive *lachen* with a so-called cognate object. A mirthless laugh is produced by Peter's laughing, it is the Theme of the event. Finally in (c), we find the prefix *ver-* that introduces the internal argument and adds further information about the relation between the event-participant and the laughing.

I conclude that the intransitive use of all verbs is semantically the same: The head of ASP is semantically empty, ASP' only denotes a predicate of events, there is no internal argument. The degree to which a verb can also have a transitive use, i.e. combine semantically with a predicate in ASP, hinges on the possibility of finding an interpretation that fits the thematic requirements of the predicate in ASP. With many verbs, the likelihood of this occuring is greater if a prefix in ASP makes the thematic relationship between argument and event more specific than the bare and unmarked Proto-Patient (Theme).

Let me finally address (iii). The number of verbs that do not have any intransitive use is very small, at least in German (cf. Stiebels 1996:123, FN 4). However, there are some verbs which require a direct object:

(105) (a) *Peter findet *(ein Buch)*
Peter finds a book

(b) *Peter stellt *(das Buch auf das Regal)*
Peter puts the book on the shelf

[29] According to my informants, a corresponding English sentence might be *Peter laughed donut-pieces*.

If verbs only denote properties of events, and something requires the realization of an internal argument in (105), then it must be properties of the event that establish this requirement. In fact, I argue that it is the aspectual specification of the event that makes the realization of an internal argument necessary in some cases.

Building on event-compositional theories by Pustejovsky (1988, 1991), van Hout (1996) claims that the basic event type properties of a verb are specified in the lexical entry of a verb, i.e. they are lexical primitives. However, the event type associated with a verb can be altered by event type-shifting operations. The final event type is the input for the mapping algorithm that determines the syntactic realization of the arguments of the verb.[30] Arguments function as syntactic "identifiers" of the event expressed by the verb (cf. Grimshaw/Vikner 1993). Consider (106), for example:

(106) (a) *Peter ate a sandwich*
(b) *Peter jumped into the ditch*

Both verbs *eat* and *jump* are lexically specified for denoting atelic events, but both can shift to a telic event type. With *eat*, this possibility is part of the semantic property of the verb. In van Hout's terms, an eating-event evolves along a *temporal scale* which is part of the meaning of *eat*. If a verb denotes a telic event type, its telicity features need to be checked in ASP (AGR-O in van Hout (1996)), according to van Hout's CHESS(=Checking Event Semantic Structure)-model. Consequently, there has to be an internal argument in SpecASP that checks off these features and indicates the endpoint of the temporal scale introduced by the verb. This internal argument has to bear strong case, i.e. it has to be bounded (or quantized, in Krifka's (1989, 1992) terms).

The telicity of (106)(b) is derived via *event type composition*: Originally, *jump* is a process verb, but again the whole predicate has shifted to a telic event type in (b). Hence, it has to combine with a "goal" PP. According to van Hout, directional PPs denote telic events themselves and take their own event participants. If they combine with a process verb, they identify the final state of the event, a subevent of the event denoted by the complex predicate. The event participants of both subevents merge: The external argument of the PP becomes the subject of the sentence.

[30] In van Hout's (1996) theory, the number of arguments selected by a particular verb is specified in the lexicon.

My proposal is similiar to van Hout's theory, although it differs slightly in some respects. According to van Hout, *eat* is able to undergo event type-shifting because of the temporal scale which is part of its meaning. As a result of event-type shifting, the predicate is telic, and therefore, event identification forces a direct argument to be realized. The transitivity of the predicate is the result of its telicity. In my account, this causal relation is reversed. In (106)(a), telicity of the predicate comes as a result of transitivity. The direct internal argument is introduced by ASP and has to be interpreted as the Theme of the event. The meaning of *eat* allows for this interpretation. In fact, the specific interpretation of the internal argument as the Incremental Theme of the event follows from the event structural properties of the verb. Its inherent temporal scale ensures that the Theme-relation is gradual. In van Hout's theory, this property of the verb allows for event type-shifting. In my proposal, it only permits linking the internal argument (which is *independently* introduced by the predicate in ASP) to the event in an incremental way. The telicity of the predicate now follows in a second step. It is only because the direct object in SpecASP is quantized (cf. Krifka 1989; Filip 1993; Borer 1996) that telicity of the verbal predicate follows from the thematic relationship established by ASP°.

A similiar reasoning can apply to (106)(b). In my account, event type composition is syntactically represented by the SC analysis discussed above (see also section 3.4). Structurally, every verb can select a SC-complement, but the resulting interpretation may be deviant, depending on the meaning of the verb. In both van Hout's and my account, it is a lexical property of the verb which is eventually responsible for the possibility of an internal argument. However, and importantly, this lexical information is not to be confused with subcategorization or argument-selection. Only structural properties of the event are lexically expressed by the verb (cf. also Davis/Demirdache (1995) for a proposal along these lines).

The impossibility of omiting the internal arguments in (105) now may follow from the assumption that verbs like *finden* and *stellen* are lexically specified to denote telic event types ("transitions" in Pustejovsky's and van Hout's terminology). This implies that there has to be an internal argument or a SC-complement which can identify the final state or the endpoint of the transitions. (105)(a) can only receive the required telic interpretation through an internal Theme argument. The event structure of the telic predicate forces the direct object to be projected. The finding-event is now "of the book", and this event participant marks the endpoint of the finding. In (b), the transition verb *stellen* needs a SC to identify its final state. The SC introduces a predicate *auf dem Regal* and the direct object *das Buch*. Without the SC or the Theme argument, the requirement to identify the event structures of the events described by *finden* and *stellen* is not fulfiled. A verb like *eat* is basically atelic, but due to its inherent

temporal scale, it allows for a telic interpretation of the predicate. In contrast, it is not the possibility but the obligation for a direct internal argument that follows from the aspectual specification of verbs like those in (105)(a).

Before I come back to SC-structures in the next section, let me take another look at ASP and compare its properties to those of other functional categories. ASP can have three specifications: It can be semantically empty (intransitive verbs), it can be morphologically empty, but denote a predicate (transitive, but unprefixed verbs); and it can be morphologically and semantically filled by a prefix. Interestingly, ASP does not seem to be the only functional category that shows these three possible specifications. Consider Tense (TNS), in comparison. In German, as in most (if not all) languages, the semantics of the present tense is not overtly expressed by a morpheme. Morphologically and semantically, the present tense is the "unmarked" form, and hence has the widest range of possible uses of all tenses.[31] I suggest that a syntactic TNS-head that is not realized morphologically but yields a temporal present tense interpretation is comparable to the ASP-head filled with the "bare" Theme-predicate. Furthermore, ASP can be filled with prefixes that specify the thematic relation between the event and its participants. Accordingly, TNS can be marked morphologically. The Simple Past, for example, is morphologically marked on the verb and contributes a relatively clear meaning that is more specific than the unmarked present tense meaning.

In the case of the intransitive use of verbs, ASP is morphologically and semantically empty. Now it is expected that we also find cases where TNS is neither marked morphologically nor provides any temporal specification. In fact, these cases do exist:

(107) (a) *Water freezes at 0 degrees*
(b) *All whales are mammals*
(c) *2 plus 2 makes 4*

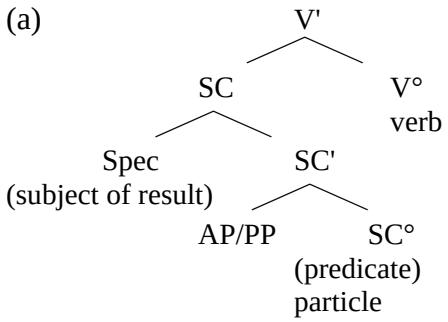
The sentences in (107) do not seem to have a temporal interpretation at all. TNS is not marked morphologically in these examples, but this corresponds to a lack of any temporal semantic contribution. The thematic category ASP seems to have a parallel in the temporal domain.

[31] The present tense can be used to refer to future events as well as to past events (in a more restricted way), cf. Zeller (1994).

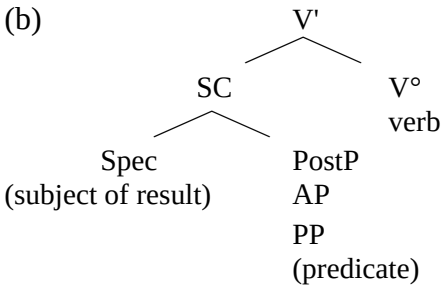
3.4 Small Clauses again

In this section, I will take a closer look at the semantics of SC structures and point to some problems that arise. In section 2.1, I argued that German allows for two possible SC-structures:

(108) (a)



(b)



Let me first look at resultative structures without particles as in (108)(b). The SC denotes the result state of the event described by the verb. Consider (109):

(109) *Sie stellten das Buch auf das Regal*
They put the book on the shelf-ACC

As I suggested above, the verb *stellen* only denotes a property of events. Its compositional "transition"-event type requires an obligatory SC-complement that identifies the resultative part of its event structure. The SC in (109) fulfils this requirement: It denotes a property of states, i.e. the book being on the shelf. As such, it can participate in the composition of the complex event type of the verbal predicate.

PPs are often analyzed as modifiers that take a verb or a verbal predicate as their arguments. However, if the SC denotes the result state of the event, it seems reasonable to assume that the directional PP in (109) expresses a function-value function of type <e,<s,t>>. The whole SC then denotes properties of states. The combination of this predicate with the verb is rendered possible through an interpertation principle suggested in Kratzer (1995), called Resultative Interpretation:

(110) Resultative Interpretation

f	g	→	$\lambda e_s \exists s_s[f(e) \wedge g(s) \wedge s = f_{result}(e)]$
<s,t>	<s,t>		

Conditions: f is a property of events, g is a property of states.

Assuming a simplified representation of the DPs *das Buch* and *das Regal*, the semantics of the verbal predicate in (111) can be derived as in (111):

(111)	(a)	*auf**	=	$\lambda x_e \lambda y_e \lambda s_s[on(x)(y)(s)]$
	(b)	*das Regal**	=	the shelf
	(c)	*auf das Regal**	=	$\lambda y_e \lambda s_s$[on the shelf(y)(s)]
	(d)	*das Buch**	=	the book
	(e)	*das Buch auf das Regal**	=	λs_s[on the shelf(the book)(s)]
	(f)	*stellen**	=	λe_s[put(e)]
	(g)	*das Buch auf das Regal stellen**	=	$\lambda e_s \exists s_s$[put(e) $\wedge$ on the shelf(the book)(s) $\wedge$ s = f_{result}(e)]

The PP in (111)(c) denotes a predicate that takes an individual type argument. This argument is saturated by the subject of result in SpecSC by Functional Application. (Remember that this DP has to move to SpecASP to receive accusative case. It therefore has to be reconstructed at LF to get interpreted in its base position.) (111)(e) and (f) combine via Resultative Interpretation. The derived predicate yields the set of all putting-events that have the book on the shelf as their result state.[32]

If the predicate is an AP, the interpretation proceeds in a similiar fashion: The AP expresses a function from individuals to states; the DP in SpecSC saturates its argument, and the SC denotes the result state of the event. Postpositional phrases can be treated analogously to PPs. The postposition can combine with a PP, but it does not change the basic semantic properties of the PP. It may, however, add some deictic or aspectual information (cf. van Riemsdijk 1990, Steinbach/Vogel 1994).

[32] An alternative way of formalizing the meaning of the directional PP might be to analyze it as a property of events that have the respective state as their result. This would capture the idea that a directional PP expresses some subevent which is directed towards a result.

Let me now turn to SCs with particles (see (108)(a)). Some particles function as predicates similiar to the PP in (109), cf.:

(112) *Sie stellten das Buch ab*
They put the book Prt

Stiebels (1996) formalizes one (of seven) meanings of *ab* as in (113) (where [PROX[OR] denotes the region close to the source of the object)[33]:

(113) *ab** = $\lambda y_e \lambda s_s[\neg LOC(y, PROX[OR]))(s)]$

Hence, the VP for (112) has the semantics in (114):

(114) *das Buch abstellen** = $\lambda e_s[put(e) \wedge \neg LOC(\text{the book}, PROX[OR]))(s) \wedge s = f_{result}(e)]$

(114) means that as a result of the putting, the book ends up being dislocated from its original place and the region around it. This is the desired result.[34]

Let me now examine the examples in (115) ((37) in section 2.1) with a particle and an additional predicate:

(115) (a) *Sie malten die Scheune rot an*
They painted the barn red Prt

(b) *Sie schickten die Briefe in die USA ab*
They sent the letters in the USA Prt

It seems that we run into problems: If the particles in (115) are predicates, it is not clear how they can combine with a predicative AP or PP. In Stiebels (1996), the particle *an* in (115)(a) is

[33] Stiebel's representation does not include the event-type variable. In her theory, particles like *ab* saturate a predicative argument of the verb and do not represent parts of a complex situation as the representation in (113) suggests.

[34] Recall that not all particles can be treated along the same lines:

(i) *jemanden anlachen* - to laugh at somebody
(ii) *sich abplagen* - to tire onself out
(iii) *aufschreien* - to cry out, to shriek

(i) and (iii) do not describe a result state. Only (i) and (ii) introduce internal arguments (a pseudo-reflexive in (ii)), the particle in (iii) is an aspectual operator. Although their structural representation properties suggest that these particles are also heads of a SC, they do not denote the same semantic type as the particle in (113). See Stiebels (1996) for discussion.

analyzed as a (lexicalized) instance of preposition incorporation. The internal argument of the preposition becomes the internal argument of the verb. The DP *die Scheune* thus is an argument of the particle. But what saturates the argument of the AP which also takes an individual type argument? The same problem arises with (115)(b): The particle *ab* has the same interpretation as in (112). Again, the internal argument is an argument of the particle and we have to worry about the unsaturated argument of the PP.

In syntax, a common way to deal with a situation where one DP saturates two arguments is to stipulate a PRO-control-relationship between the two relevant argument positions. For (115), this would imply that the internal arguments are indeed arguments of the particles. They control a phonetically empty pronominal element in the specifiers of the predicate phrases. This element can saturate the argument of the AP and the PP, respectively.[35]

There is another possible solution to the problem posed by (115). Instead of assuming that the AP takes individual-type arguments, we might as well suppose that the AP does not denote a relation between an argument and a state. Rather, it only expresses properties of states:

(116) *rot**: = λs_s[red(s)]

The adjective denotes the state of being red. Remember that I argue that verbs only denote events and that their arguments are introduced by independent predicates in the syntax. Suppose the same is true for adjectives: Their arguments have to be introduced by an independent predicate - a particle. So the adjective in (116) and a predicative particle meaning can combine via Event-Identification (which is also defined for stative predicates, see section 3.1). Notice that this assumption excludes structures like (108)(b) for APs, since every resultative AP needs a (sometimes not overtly realized) particle to introduce the Holder of the state described by the adjective.[36]

---

[35] The control-solution may also account for cases where the subject of a resultative SC is also interpreted as the argument of the verb. The internal argument is generated in SpecASP, but stands in a control-relationship with a SC-internal PRO-argument; the subject of the SC-predicate. However, as von Stechow (1995) points out, PRO inside the SC is governed by the matrix verb in this type of configuration. For the cases discussed above, it would be the particle that governs PRO. I do not want to discuss this issue, but notice that something like the PRO-solution has to be adopted to account for the particle-prefix iterations discussed in section 2.2.

[36] The assumption that certain adjectives only denote properties of states may provide an explanation for the derivation of deadjectival verbs as in (i):

(i) *Die Nachricht beunruhigt den Piloten*
The news Prt-worry the pilot

If we assume that prefixes like *be-* in (i) denote predicates similiar to the meaning they have if they combine with verbs, then the derivation from adjectives poses a problem under the traditional view that adjectives are of type <e,<s,t>>. However, if adjectives only denote properties of states, then the derivation of verbs as in (i) follows from the meaning of the particle and a modified version of the principle of Result Interpretation:

If particles take complement PPs, an interesting observation can be made: Although the combination of a particle and a directional PP seems perfectly possible in (115)(b), there are certain verbs where this does not seem to be the case:

(117) (a) ??*Sie stellten das Buch auf das Regal ab*
They put the book on the shelf-ACC Prt

(b) *Sie stellten das Buch auf dem Regal ab*
They put the book on the shelf-DAT Prt

If a preposition can head both a directional and a locational PP in German, it usually assigns accusative case to its argument if the PP is directional, but dative case if it is locational. Notice that (117)(a) is only marginally grammatical if the directional PP is the complement of a particle, but the particle can easily combine with the locational PP. However, the unmodified verb *stellen* is acceptable only if the PP-internal argument bears accusative case:

(118) (a) *Sie stellten das Buch auf das Regal*
They put the book on the shelf-ACC

(b) **Sie stellten das Buch auf dem Regal*
They put the book on the shelf-DAT

(117)(a) suggests that there are some problems with combining two stative predicates of type <e,<s,t>> (I return to this point below). But since locational PPs can combine with particles, it seems that there is a semantic difference between the two kinds of PPs. This semantic difference is also suggested by (118): (118)(b) shows that locational PPs do not fulfil the selectional requirement imposed by verbs of the "transition"-event-type, i.e. they do not seem to be able to identify this event type of the predicate.

There are further differences between directional and locational PPs. Hoekstra/Mulder (1990) show that only locational PPs (analyzed as syntactic adjuncts) can be extraposed (cf.

(ii) (a) *unruhig** = λs_s[worried(s)]

(b) *be-** = $\lambda x_e \lambda e_s$[BEI*$_1$(x)(e) $\wedge$ AFFECTED_BY(x)(e)]

(c) *beunruhigen** = $\lambda x_e \lambda e_s$[worried(s) $\wedge$ f_{result}(e) = s $\wedge$ HOLDER(x)(s) $\wedge$ BEI*$_1$(x)(e) $\wedge$ AFFECTED_BY(x)(e)]

According to (ii), *beunruhigen* denotes the set of events that are at x and that affect x, and as a result of these events, x is worried. This is in fact what *beunruhigen* means. However, I do not want to discuss the further consequences and predictions of this view in this paper.

Steinbach/Vogel (1994) for German). Furthermore, only the directional PP in (119)(a) can change the event type of the predicate:

(119) (a) *Peter ist in den Graben gesprungen*
Peter is in the ditch-ACC jumped

(b) *Peter ist in dem Graben gesprungen*
Peter is in the ditch-DAT jumped

As already noted in section 2, (119)(b) describes an atelic event (the verb being unergative), whereas (a) is telic (unaccusative). Again, it seems to be the semantic difference between the two PPs that is responsible for the aspectual difference between (119)(a) and (b).

To account for the differences illustrated in (117)-(119), I propose that locational PPs like *auf dem Regal*-DAT or *in dem Graben*-DAT do not have the same semantic type as the directional ones. I suggest that they are predicate modifiers rather than predicates. This explains that they cannot replace a prepositional predicate, but can modify a particle, as shown in (117)(b) and (118)(b). The representation is given in (120)(a). The locational PP combines with the meaning of the particle via Function Composition.[37] The derived result is a complex predicate expressing a relation between an individual and the state of being dislocated from the original position *and* of being on the shelf:

(120) (a) *auf dem Regal** = $\lambda P_{<s,t>>}\lambda s_s[P(s) \wedge$ on the shelf(s)]

(b) *ab** = $\lambda y_e\lambda s_s[\neg LOC(y, PROX[OR]))(s)]$

(c) *auf dem Regal ab** = $\lambda y_e\lambda s_s[\neg LOC(y,PROX[OR]))(s) \wedge$ on the shelf(s)]

(121) Function Composition:

f	g	→	h
$<\alpha,\beta>$	$<e,\alpha>$		$<e,\beta>$
$\lambda y_e[f (g(x))]$			

This account explains the aspectual difference between (119)(a) and (b). (119)(a) denotes an event of jumping and its result state. This result state expressed by the SC can identify the telic

[37] Function Composition makes it possible to delay the saturation of the argument of the adjective until the functor has been applied. In (120), the PP takes the place of the function f in (121) (with $\alpha = <s,t>$ and $\beta = <s,t>$), the meaning of the particle is g of type $<e,<s,t>>$. The derived result is a function of type $<e,<s,t>>$.

event type of the predicate. In (119)(b), however, the PP only modifies the event according to its meaning given in (120)(a); (119)(b) denotes a jumping event which takes place in the ditch:

(122) (a) *springen** = λe_s[jump(e)]

(b) *Peter in den Graben** = λs_s[in the ditch(Peter)(s)]

(c) *Peter in den Graben springen** = $\lambda e_s \exists s_s$[jump(e) $\wedge$ in the ditch(Peter)(s) $\wedge$ f_{result}(e) = s]

(123) (a) *in dem Graben** = $\lambda P_{<s,t>} \lambda e_s$[P(e) $\wedge$ in the ditch(e)]

(b) *in dem Graben springen** = λe_s[jump(e) $\wedge$ in the ditch(e)]

Furthermore, this proposal explains why only locational PPs can appear in copular constructions:

(124) (a) *Peter ist im Garten*
Peter is in garden-DAT

(b) **Peter ist in den Garten*
Peter is in the garden-ACC

As argued in Kratzer (1994), the function of the copula *sein*, "be", in (124) is to locate a state. Its denotation is given in (125):

(125) *sein** = $\lambda x_e \lambda s_s$[LOCATION(x)(s)]

(125) can combine with the denotation of the modifier (represented similiar to (120)(a)), and the result is predicated of *Peter*. This is why (124)(a) is grammatical. In certain dialects, though, (124)(b) is also grammatical. It means that Peter has undertaken some activity that should have the result of bringing him into the garden. This is expected: We can assume that (124)(b), if grammatical, involves the insertion of some empty verb that stands for an unspecified event. If combined with the directional PP, the whole predicate consequently denotes an event that has Peter in the garden as its result.

There are some problems with this account, though. First, the meaning of the locational PP that modifies a stative predicate is different from its meaning if it applies to an eventive predicate (cf. (120)(a) vs. (123)(a)). Second, if it is really a type-mismatch that is responsible

for the marginality of the PP+particle-combination in (117)(a), we expect the same degree of deviance in all other examples. But whereas (124)(b), on the one hand, is not only marginal, but ungrammatical, some sentences such as (115)(b), on the other hand, are perfectly well-formed (although both a directional PP and a particle appear in the SC). Third, and importantly, the combination of two predicates that excludes cases such as (117)(a) is not in general excluded. To overcome the problem of compositional semantics, whereby some predicates can be used both attributively and as restrictive modifiers, it has been proposed that the combination of two predicates be allowed by simply merging their individual-type arguments. Although there are several different names for this operation such as "θ-identification" (Higginbotham 1985), "functional unification" (Wunderlich 1987), "predicate conjunction" (Kratzer 1995) or "predicate modification" (Heim/Kratzer (in press)), this mechanism is widely accepted in semantic theories. Note that the interpretation process of Event Identification that I use in my proposal also permits the conjunction of two predicates of the same event-type. Nevertheless, the reason for rejecting (117)(a) must be semantic in nature, since the syntax does allow for the combination particle+PP. Therefore, in spite of some problems in detail, I argue that a semantic explanation along the lines proposed in this section points in the right direction.

Postpositional phrases can include both directional or locational PPs, but since postpositions do not change the basic semantic type of the predicate, they too can only combine with a particle if their complement is a locational PP. Furthermore, the result state of a complex event type can consequently only be identified if the complement PP is directional:

(126) (a) ??*Sie stellten das Buch auf das Regal drauf ab*
They put the book on the shelf-ACC on Prt

(b) *Sie stellten das Buch auf dem Regal drauf ab*
They put the book on the shelf-DAT on Prt

(127) (a) *Sie stellten das Buch auf das Regal drauf*
They put the book on the shelf-ACC on

(b) **Sie stellten das Buch auf dem Regal drauf*
They put the book on the shelf-DAT on

(126) and (127) confirm the suggested semantic type-difference between directional and locational PPs. Moreover, (126)(b) provides further evidence for my claim that postpositions and particles are not the same elements, but that they can both modify the same verb in German if the semantic and syntactic requirements are met.

4. Some remarks on aspect

In this last section, I want to compare some properties of German verbal modifiers with properties of prefixes in languages that have a strong aspectual system. In Slavic languages, perfective aspect is marked by prefixes on the verb. Some examples from Czech and their German and English translations are given in (128):

(128) (a) *napsat* - "write up"
"aufschreiben"
(b) *nadepsat* - "write above", "entitle"
"überschreiben"
(c) *dopsat* - "finish writing"
"fertigschreiben"
(d) *obepsat* - "write all around"
"herumschreiben"
(e) *popsat* - "cover with writing", "describe"
"beschreiben"
(f) *predepsat* - "prescribe"
"verschreiben"
(g) *rozepsat* - "write out"
"ausschreiben"

All examples can be translated into German by modifying the basic verb *schreiben* with a particle, a resultative or a prefix. In some cases, the semantic parallels are striking. In (e), for example, both of the two meanings of *popsat* (the productive and the lexicalized) can be ascribed to the German word *beschreiben*. Given that only "cover with writing" can be compositionally derived from the verb *schreiben* and the meaning of the prefix, it seems that the correspondence between perfective markers and prefixes is strong enough even to influence the lexicalization of complex forms.

Furthermore, consider the version of the locative alternation in German in (129) and compare it to the examples from Czech, given in (130):

(129) (a) *daß Peter das Heu (auf den Wagen) auflädt*
that Peter the hay-ACC (on the waggon) Prt-loads

(b) *daß Peter den Wagen* (*mit dem Heu*) *belädt*
that Peter the waggon-ACC (with the hay) Pref-loads

(130) (a) *Maloval hesla* (*na stena*)
painted slogans-ACC on wall
"He painted slogans on the wall"

(b) *Pomaloval stenu* (*hesly*)
Pref-painted wall-ACC (slogans-INSTR)
"He covered the wall with slogans"

In (130)(b), with "the wall" realized as the direct object, the verb is prefixed with *po-*. Accordingly, the German translation shows the prefix *be-* in the alternation (see also (92) above). Note that the preposition *na* that realizes this argument in (130)(a) can also be used as a perfectivity marker (cf. (128)(a)). The German translation of the preposition *na* (= *auf*) can also appear as a postposition with the verb. In fact, it is exactly this modifier that can optionally be used in this variant of the locative alternation in German (cf. (129)(a)).

A third observation is even more important with respect to my claim that all prefixes in German introduce individual-type arguments. Filip (1993:178) notes that in Czech, the perfective prefixes have "effects on the argument structure of verbs". As she points out (1993:211), "Prefixation typically alters lexical semantic properties of verbs, which in turn has effects on the argument structure of derived verbs. In Slavic languages, like in other Indo-European languages, there are numerous examples in which prefixation functions as a lexical process of transitivization". A similiar observation is made in Schooerlemmer (1993, 1995). She emphasizes that in Russian, all perfective verbs have to select an internal argument, and thus they are either transitive or unaccusative. This supports my basic claim that prefixes introduce internal arguments.

It seems that there are important parallels between perfectivity markers in Slavic languages and German prefixes. Indeed, this conclusion has already been drawn by German philologists like Jacob Grimm or Wilhelm Streitberg in the 19th century who (to my knowledge) first drew attention to the apparent parallels between German prefixes and perfective prefixes in the Slavic languages. However, despite their apparent similiarities, perfectivity markers in Slavic languages and German prefixes do not contribute to the meaning of a sentence in the same way. For example, a typical property of perfective verbs in Slavic languages is to provide a future interpretation if they appear in the simple present tense. In contrast, all German examples that have been given in the present tense in this paper also

receive a present tense-interpretation.[38] Other evident differences strongly suggest that the story is not as simple as it may initially appear.

The main difference between prefixes in German and in Slavic languages seems to be that the former do not affect the aspectual specification of a sentence in the same regular way as the latter. However, prefixes in German give very specific information about the relation between the arguments they introduce and the event (which can have effect on the aspectual structure of the event, see section 3.3). Hence, it might be useful to investigate the respective properties of perfective markers in Slavic languages to see if further similiarities can be found. A first step in this direction has been taken by Hana Filip (1993, 1995).

In recent work on aspect and quantification (cf. Partee 1991; Bach et al. 1995) it is has been argued that quantification over individual arguments of the verb is not expressed only by determiners which modify the noun phrases. It can also be indicated by morphemes attached to the verb that selects these arguments. This presupposes a homomorphic relationship between the verb and its argument, i.e., the object has to be the Incremental Theme argument in the sense of Krifka (1989, 1992) and Dowty (1991) (see section 3.2 above). Hana Filip (1992, 1993, 1995) has extended Krifka and Dowty's ideas to an analysis of aspect in Czech and other languages. She argues that verbal prefixes indicating perfective aspect in the Slavic languages also carry information about quantificational notions that is transposed onto the nominal predicate. Consider (131), for example, which is taken from Filip (1993:19 and 222):

(131) (a) *Pozamykal zásuvky*
lock-3Sg-PERF drawers-ACC
"He locked all the drawers" (gradually, in a distributive fashion)

(b) *Zamykal zásuvky*
lock-3Sg-IMP drawers-ACC
"He locked (some) drawers"

Slavic languages lack determiners. The internal argument in (131)(a) and (b) is not further specified with respect to definiteness. The aspectual meaning of the perfective verb in (131)(a) implies that the event of locking the drawers was completed. But furthermore, the perfective sentence also entails that the event was completed when *all* the drawers were locked. According to Filip, perfective aspect affects the semantic of the nominal argument in a way that is similiar

[38] In Finnish, DPs show a partitive/accusative case alternation. Filip (1993) notes that present tense sentences with accusative objects receive a future tense interpretation (as is the case with prefixed verbs in Czech. It is of particular interest that prefixed verbs are always associated with accusative case.

to *universal quantification*. If the imperfective sentence in (b) has a progressive meaning, the object is interpreted as "some drawers", i.e. it receives a *partitive interpretation*. It seems that the holistic or partitive view on the event which is triggered by the meaning of grammatical aspect can be transposed onto the nominal (Incremental Theme) predicate. Now recall that the German prefix *be-* (which seems to have a meaning similiar to the Czech prefix *po-*) was associated with a holistic or totally affected interpretation of the internal argument. In section 3.2, I have left this affectedness-relation unspecified. But it might be possible to capture the properties of this relation in terms of universal quantification over (parts of) the internal argument.

The holistic meaning is "carried by all perfective operators" (Filip 1995:15), i.e. introduced by all perfective prefixes. But there is a second way in which these prefixes affect the interpretation of the nominal argument of the verb: Particular prefixes carry even more specific quantificational information about these arguments. The prefix *po-* in (131)(a), for example, also requires a *distributive* interpretation of the plural argument *zásuvky*: (131)(a) is only true if all the drawers were locked in a successive fashion, one after another. If they were all locked at once, it would be inappropriate to utter (131)(a). Further quantificational notions contributed by perfective affixes are vague quantification ("many"), partitivity, or measure.

Interestingly, some uses of the German prefix *ver-* also suggest a distributive interpretation:

(132) (a) *Peter schickte die Briefe an seine Verwandten*
Peter sent the letters-ACC to his relatives

(b) *Peter verschickte die Briefe an seine Verwandten*
Peter Pref-sent the letters-ACC to his relatives

The unprefixed verb in (132)(a) allows for an interpretation that Peter sent all the letters to one particular address (e.g. to the home of his uncle, aunt and cousins). In this case, the sentence expresses a number of sending-events, and each of it has the same addressee. However, the most natural interpretation for (132)(b) is that there is only one event of sending all the letters, but to different relatives. This distributive interpretation seems to be part of the meaning of *ver-*.

It looks promising to investigate more of the similiarities between verbal modifiers with respect to their quantificational impact on the interpretation of internal arguments. One of the reasons for thedifferent aspectual interpretations of verbal predicates in German and Czech

might then be found in the differences between noun phrases. Whereas German has a rich determiner system, the Slavic languages lack determiners.

Another source for comparison might be the historical development of prefixes in Slavic and Germanic languages. Most German verbal modifiers are derived from prepositional elements. The different types of modifiers discussed in this paper seem to mirror the different stages of this development. Some resultatives are postpositions, but most particles have lost their prepositional meaning. P-prefixes are incorporated prepositions that also contribute aspectual information bthrough their incorporation into ASP. The next step seems to be the development of bound verbal prefixes that are independent elements but are also derived from prepositions (cf. Wunderlich's treatment of *be-* illustrated in section 3.2). Similiar observations have been made for Slavic languages as well. Walinska (1990), for example, argues that perfective prefixes in Polish are in fact prepositions.

Maybe both German and Slavic languages represent different stages of a general tendency of prepositions to turn into (aspectual) prefixes. This prepositional nature would explain the predicative properties and the argument structure-changing effects that these elements seem to have across languages. I leave this to future research.

5. References

Bach, E. (1981), "On Time, Tense, and Aspect: An Essay in English Metaphysics", in: Cole, P. (ed), *Radical Pragmatics*, New York, Academic Press, 62-81.

Bach, E. (1986), "The Algebra of Events", *Linguistics and Philosophy 9*, 5-16.

Bach, E./Jelinek, E./ Kratzer, A./ Partee, B.H. (1995)(eds.): *Quantification in Natural Languages*. Dordrecht: Kluwer.

Baker, M. (1988), *Incorporation. A Theory of Grammatical Function Changing*. Chicago/London.

Booij, G./Haaften, T. van (1988), "On the External Syntax of Derived Words: Evidence from Dutch", in: Booij, G./Marle, J. van (eds.): *Yearbook of Morphoogy 1*, Foris, Dordrecht, 29-44.

Borer, H. (1994), "The Projection of Arguments", Ms., University of Massachusetts, Amherst.

Borer, H. (1995), Class lectures, Fall 1995, University of Massachusetts, Amherst.

Borer, H. (1996), "Passive without Theta Grids", to appear in: Lapointe, S. (ed.), *Morphological Interfaces*. CSLI, Stanford.

Chomsky, N. (1981), *Lectures on Government and Binding*. Dordrecht.

Chomsky, N. (1986), *Knowledge of Language*. New York.

Chomsky, N. (1989), "Some Notes on Economy of Derivation and Representation", *MIT Working Papers in Linguistic 10, Functional Heads and Clause Structure*, S. 43-74.

Chomsky, N. (1992), "A Minimalist Programm for Linguistic Theory". *MIT Occasional Papers in Linguistics 1*.

Chomsky, N. (1994), "Bare Phrase Structure", *MIT Occasional Papers in Linguistics 5*.

Davidson, D. (1968), "The Logical Form of Action Sentences", in: Rescher, N. (hrsg.), *The logic of decision and action*. Pittsburgh, S. 81-120.

Davis, H,/Demirdache, H. (1995), "Agents and events". Talk presented at GLOW 18, University of Tromso, Norway.

Dikken, M. den (1987), "Secundaire predicatie en de analyse van small clauses", in GLOT 10, 1-28.

Dikken, M. den (1995), *Particles.On theSyntax of Verb-Particle, Triadic, and Causative Constructions*. New York/Oxford: Oxfors University Press.

Dowty, D.R. (1989), "On the semantic content of the notion 'thematic role'", in: Chierchia, G./Partee, B.H./Turner, R. (eds.), *Properties, types, and meaning*. Dordrecht: Kluwer, 69-129.

Dowty, D.R. (1991), "Thematic Proto-Roles and Argument Selection", *Language 67*, 547-619.

Emonds, J. (1976), *A Transformational Approach to English Syntax*, New York: Academic Press.

Filip, H. (1992), "Aspect and Interpretation of Nominal Arguments", *CLS 28*.

Filip, H. (1993), *Aspect, Situation Types and Nominal Reference*. Diss., University of California at Berkeley.

Filip, H.(1995), "Integrating Telicity, Aspect and NP Semantics: The Role of Thematic Structure", in Toman, J. (ed.), *Formal Approaches to Slavic Linguistics, Vol. 3*. Ann Arbor: Michigan Slavic Publications,

Galloway, Brent D. (1990), *A Phonology, Morphology, and Classified Word List for the Samish Dialect of Straits Salish*. Canadian Ethnology Service, Mercury Series Paper 116.

Grewendorf, G. (1989), *Ergativity in German*. Dordrecht: Foris.

Grewendorf, G. (1990), "Verbbewegung und Negation im Deutschen", in: *Groninger Arbeiten zur Germanistischen Linguistik 30*, x-y.

Grewendorf, G./Sabel, J. (1994), "Long Scrambling and Incorporation", *Linguistic Inquiry 25*, 263-308.

Grimshaw/Vikner (1993), "Obligatory adjuncts and the structure of events", in: Reuland, E./Abraham, W. (eds), *Knowledge and Language*, Vol. II. Dordrecht: Kluwer, 143-155.

Guenther, H. (1974), *Das System der Verben mit be- in der deutschen Sprache der Gegenwart*. Tübingen, Niemeyer.

Heim, I./Kratzer, A. (in press), *Semantics in Generative Grammar*.

Higginbotham, J. (1985), "On Semantics", *Linguistic Inquiry 16*, 547-593.

Hoekstra, T. (1988), "Small Clause Results", in *Lingua 74*, 101-139.

Hoekstra, T. (1992), "Aspect and Theta Theory", in: Roca, I.M.: *Thematic Structure: Its Role in Grammar*. Berlin/New York, 145-174.

Hoekstra, T./Mulder, R. (1990), "Unergatives as Copular Verbs: Locational and Existential Predication", *Linguistic Review 7*, S. 1-79.

Hout, A. van (1996), *Event Semantics of Verb Frame Alternations*. Tilburg, TILDIL Dissertation Series.

Jackendoff, R. (1990), *Semantic Structures*. Cambridge, MIT Press.

Jelinek, E. (1995), "Quantification in Straits Salish", in: Bach, E., Jelinek, E., Kratzer, A., Partee, B. (ed.): *Quantification in Natural Languages*, 487-540.

Johnson, K. (1991), "Object Positions", in: *Natural Language and Linguistic Theory 9*, 577-636.

Kayne, R. (1984), *Connectedness and Binary Branching*. Dordrecht: Foris.

Kayne, R. (1985), "Principles of Particle Constructions", in: Guéron, J./Obenauer, H.-G./Pollock, J.-Y. (eds.), *Grammatical Representation*. Dordrecht: Foris, 101-140.

Keyser, S.J./Roeper, T. (1995), "Anti-symmetry and Leftward Movement in Morphology", Ms., University of Massachusetts, Amherst.

Kratzer, A. (1994), *The Event Argument*. Ms., University of Massachusetts, Amherst.

Kratzer, A. (1995), Class lectures, Fall 1995, University of Massachusetts, Amherst.

Krifka, M. (1989), "Nominal Reference, Temporal Constitution and Quantification in Event Semantics", in: Bartsch, R., van Benthem, J., van Emde Boas, P (ed.).: *Semantics and Contextual Expression*. Dordrecht, 75-115.

Krifka, M. (1992), „Thematic Relations as Links between Nominal Reference and Temporal Constitution", in: Sag, I./Szabolcsi, A. (ed.), *Lexical Matters*, CSLI Lecture Notes, Stanford, Cal., S. 29-53.

Lieber, R./Baayen, H. (1993), "Verbal prefixes in Dutch: a study in lexical conceptual structure", in: *Yearbook of Morphology 1993*, 51-78.

Mulder, R. (1992), *The Aspectual Nature of Syntactic Complementation*. Diss., University of Leiden (HIL Dissertations 3).

Neeleman, A./Schipper, J. (1993), "Verbal prefixation in Dutch: thematic evidence for conversion", in: *Yearbook of morphology 1992*, 57-92.

Ouhalla, J. (1991), *Functional Categories and Parametric Variation*. London.

Parsons, T. (1990), *Events in the Semantics of English*. Cambridge.

Parsons, T. (1995), "Thematic Relations and Arguments", *Linguistic Inquiry 26*, 635-662.

Partee, B. (1991), "Adverbial Quantification and Event Structures", in: *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistic Society*. Berkeley.

Pustejovsky, J. (1988), "The geometry of events", in: Tenny, C. (ed), *Studies in generative approaches to aspect*. Lexicon Project Working Papers 24. Center for Cognitive Science, MIT, Cambridge.

Pustejovsky, J. (1991), "The syntax of event structure", *Cognition 41*, 47-81.

van Riemsdijk, H. van, (1978), *A Case Study in Syntactic Markedness*, Dordrecht: Foris.

van Riemsdijk, H. van (1990), "Functional Prepositions", in: Pinkster, H./Genee, I. (eds.): *Unity in Diversity*. Dordrecht: Foris, 229-241.

Schoorlemmer, M. (1993), „Aspectual Morphology, Passive and Nominalization in Russian“, Mskr., Universität Utrecht.

Schoorlemmer, M. (1995), *Participial Passive and Aspect in Russian*. Diss., Utrecht.

Steinbach, M./Vogel, R. (1994), *Zum Konzept der Tiefenstruktur in der Generativen Grammatik*. Magisterarbeit, Univ. Frankfurt.

Stiebels, B. (1996), *Lexikalische Argumente und Adjunkte*. Berlin, Akademie Verlag (*studia grammatica* 39).

Stiebels, B./Wunderlich, D. (1992), "A lexical account of complex verbs", Arbeiten des SFB "Theorie des Lexikons" 30, Düsseldorf.

Stowell, T. (1981), *Origins of Phrase Structure*. Diss., MIT.

Tenny, C. (1992), "The Aspectual Interface Hypothesis", in: Sag, I./Szabolcsi, A. (hrsg.), *Lexical Matters*, CSLI Lecture Notes, Stanford, Cal., S. 1-27.

Tenny, C. (1994), *Aspectual Roles and the Syntax-Semantics Interface*. Dordrecht.

Vendler, Z. (1967), *Linguistics and Philosophy*. Ithaca.

von Stechow, A. (1995), "Lexical Decomposition in Syntax", in: Egli, U. et al. (eds), *Lexical Knowledge in the Organization of Language*.Amsterdam: John Benjamin, 81-117.

Walinska, H. (1990), "The Syntax of Slavic Aspect", in: Stokhof, M./Jorenvliet, L. (eds.), *Proceedings of the Seventh Amsterdam Colloquium*. Amsterdam.

Wunderlich, D. (1987), "An investigation of lexical composition: the case of German *be*-verbs", *Linguistics 25*, 283-331.

Wunderlich, D. (1993), "On German *um*: semantic and conceptual aspects", *Linguistics 31*, 111-133.

Zeller, J. (1994), *Die Syntax des Tempus*. Opladen.

Zwart, C.J.W. (1993), *Dutch Syntax: A Minimalist Approach*. Diss., University of Groningen.

Jochen Zeller
University of Massachusetts at Amherst/
Johann Wolfgang Goethe Universität Frankfurt
jzeller@linguist.umass.edu
zeller@lingua.uni-frankfurt.d400.de