

Particle Verbs and Prefix Verbs in German: Linking Theory versus Word-syntax¹

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1. Introduction

The theory of Semantic Form (SF) has played a pivotal role in Lexical Semantics, especially in the Lexical Semantics of German. The seminal works of (Stiebels & Wunderlich 1994), (Stiebels 1996), (Stiebels 1998) which build on the more general assumptions of (Wunderlich 1997) are not only impressive because of the depth and width of their empirical coverage, they also extend the general SF framework with a set of assumptions for the treatment of the semantics of German prefix and particle verbs. The main challenge these verbs pose is that of compositionality: can the meaning of such a verb be predicted, on the basis of general principles, from that of the particle or prefix and the remainder (usually, though not generally itself a verb)? I share with the authors the conviction, that compositionality plays an important role in the semantics of these verbs, even though the compositional principles that govern many of them do not apply to all. But even if their rules are only 'semi-productive'² it is they that ought to be the target of systematic investigation. In other words, the target of such an investigation should be the 'syntax-semantics-interface' for such words.

One merit of the SF-framework is that it shows how a compositional interface can be defined between the syntactic grid of a prefix or particle verb and conceptual structure that determines its meaning. In SF-theory this interface takes the form of derivations

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² See (McIntyre 2002) for discussion.

within a type logical system. Derivations are modelled by applying functional application and functional composition on SF- representations.

The solutions within this framework will be compared with rule-based syntactic and semantic representations in the tradition of word-syntax following (Hale & Keyser 2002). Although I am not in a position to present fully specified rules, I will present word-syntactic structural representations and algorithms of semantic interpretation. These indicate what the general rules are.

The structural representations used in the approach to which the present paper belongs owe much to the framework of *Distributive Morphology* (DM) cf. (Marantz 2005) (Pylkkänen 2007). Moreover, those that are shown here, obey the Head-Movement-Constraint (Baker1988). But while these syntactic principles have been an important guideline, the rules exemplified in the analyses I will display grew first and foremost out of semantic considerations: for me the ultimate justification of the syntactic principles lies in large part in their providing a viable basis for semantic interpretation.

Semantics construction, as it is understood here, is the construction of Discourse Representation Structures (DRSs). (For Discourse Representation Theory (DRT), s. (Kamp/Reyle 1993), (van Genabith, Kamp & Reyle 2008). DRT has traditionally been concerned with semantic representations of texts with a special attention to presupposition and trans-sentential anaphoric connections. Applying principles of DRS-construction to the sub-lexical domain has proved fruitful in particular because of the means they offer for handling presuppositions and variable binding (in the form of binding of discourse referents). Analyses of the internal syntactic and semantic structure of words first proved its usefulness to us when trying to give a systematic account of the availability and meaning of German *-ung*-nominals. For Details of why an approach to word syntax and semantics is useful in dealing with the puzzles of *ung*-formation see (Roßdeutscher & Kamp 2010). I will recall some of the results reported there in the course of this paper.

Two central questions concerning the syntactic and semantic structure of verbs (and other predicate words) are the creation of their argument structure and the filling of the argument slots (typically, if not always, by actual argument phrases that co-occur with the word in a sentence or clause). It is important to keep these questions separate. The first can be formulated as a question about the where and how of the creation of *argument slots*, while the second concerns the when and how of filling them in supra-lexical constructions. In 'lexicalist' approaches to the syntax-semantics interface in which

lexical entries are assumed to function as black boxes, only the second question is relevant. The first is not, in fact, it can not even be raised.

In the SF-framework questions about argument structure arise as well. But there they take a somewhat different form. Prefix and particle verbs are assumed to be the result of combining the prefix or particle with a 'base verb', for which the argument structure is assumed as given. The problem then is to account for when and how the argument structure of the complex verb differs from that of the base verb; or put in somewhat different terms, what are the operations associated with the prefixes and particles that transform the base verb entries, with their argument frames, into the entries of the complex obtained through prefixation with their frames.

Frameworks like the one I am assuming here, which follow the idea that complex verbs are created by applying syntactic rules of MERGE and MOVE to sub-lexical syntactic structures must account for argument structure as well. In the particular kind of word-syntactic framework that I am pursuing in this paper I assume that argument slots can be contributed by roots. For instance, the verbal root of unaccusative verbs like *√fall* introduce the slot for the (verb-internal) subject. Adjectival and nominal roots, which are the building blocks of other types of verbs, introduce argument slots as well.

In this regard I differ from many syntactic approaches to word structure from the DM-literature, which assume that argument slots are created rather by functional heads within the structure of verbs or are added by subsequent 'external' operations, which add agentive subjects or the thematic direct objects of non-core-transitives (cf. Levin 1999), (Kratzer 1996), (Kratzer 2004). As far as such 'external' arguments are concerned, I follow these authors. Much of what I assume about the 'external' part of verb structure is inspired by (Marantz 2005).

Since I assume that particles come with their own root based structure, the problem which argument structure we get when a particle or prefix is combined with some other root based structure now becomes the question according to what principles such structures can be merged into a single complex verb: merging two structures, we will see, can involve both identification (or 'unification') of slots from the two structures and eliminating certain slots through an operation of filling and binding, (I.e. the slot is filled with a variable which is then bound as part of forming the MERGE.)

1.1 Some elements of the theory of Semantic Form

In this subsection I review some of the principles of SF-Theory. For further motivation and introduction the reader is referred to (Wunderlich 1997) and (Stiebels 1996). The fundamental idea of the linking theory is as follows: The Semantic Form (SF) of a verb is an interface between syntactic form and conceptual structure. The SF-representation of a verb is built according to rules of type logic, using functional application and functional composition. All variables representing participants of the situation which the verb describes are placed within a hierarchy defined by the categorial-syntactic representation of SF. Theta-structure is represented by a sequence of λ -abstractors that form an initial segment of each SF-representation. The abstractors in this sequence bind the variables occurring in the matrix of the representation and are ordered according to the positions in that matrix of the variables they bind (-- in 'inverse order' so to speak). The order in which the λ -abstractors appear in the prefix of an SF-representation is crucial to the role that the represented word can play in syntactically and semantically well-formed clauses: the outermost abstractor must be converted in the first syntactic configuration that the represented word enters into in the syntactic structure of the clause; then the second abstractor and so on. Furthermore the position of a variable in the SF representation determines the syntactic features of its possible realisations as argument phrase in a particular case. The most deeply embedded variable comes with the case assignment 'accusative' and thus is realised as direct object, the least deeply embedded argument gets nominative and is realised as subject; variables realised as datives occupy some intermediate position. The construction of the λ -prefix of the SF-representation of a complex verb presents a special challenge, as it is not immediately clear how the contributions made by the base predicate and that made by the prefix or particle should be interrelated. But it is this which determines both the form of argument realisation and the order of semantic composition within the clause.

The SF approach also allows for argument blocking. Argument blocking is accounted for as follows: Some of the arguments of an SF-representation and abstracted over somewhere in the λ -prefix of the representations will not succeed in being structurally linked. Whether they are or not is determined by a syntax-like organisation principle to which SF-representations are subject. Important in this respect is the representation of the conjunction '&' at the level of SF-representations: The conjunct to the right of '&' counts as more deeply embedded than the conjunct on its left.

Structural realisation of arguments is subject to the following constraint:

(RSA) Restriction on Structural Arguments:

An argument is structural only if it is either the lowest argument or (each of its occurrences) *L-commands* the lowest argument. (Wunderlich:1997:41).

(LC) L-command:

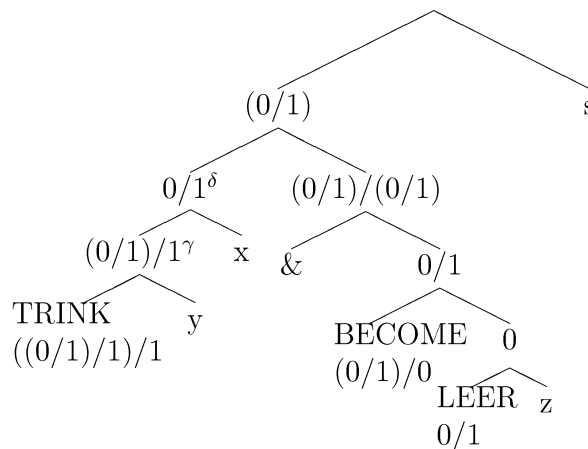
α L-commands β iff the node γ which either directly dominates α or dominates α via a chain of nodes type-identical to γ also dominates β (Wunderlich 1997:41).

As an illustration of SF-principles I cite here a well-known example from (Wunderlich 1997). (The representation has been adopted to the style in (Stiebels 1996)). The example shows the SF-representation of resultative secondary predication as in (1). It is instructive both as an instance of how secondary predicate can extend argument structure and how arguments of the base verb can be blocked. The resultative predicate *leer* introduces an argument, *z*, into the structure. The internal argument of *trinken*, *y*, becomes thereby blocked.

- (1) Er trinkt das Glas leer
'he drinks the glass empty '

The SF-Representation, the lexical tree of *leertrinken* (to drink empty) with the logical types of its predicates, is presented in (2).

(2)



Drinking and becoming empty are represented as situation properties of the same situation *s*. The adjoined conjunct on the right is more deeply embedded than the left. In this way *z* gets singled out as most deeply embedded argument, *y* does not L-command *z*, and thus *z* becomes the direct object.

The operation of SF-conjunction is restricted. In (1) SF-conjunction is legitimate because the drinking event causally leads to the glass becoming empty.³

(COH) Coherence:

A lexical SF-conjunction is contemporaneously or causally connected.

Importantly, SF-conjunction specifies one single event (the situation *s*) so long as it determines a coherent conjunction of event properties.

The mechanisms of extension of argument structure and blocking of structural arguments of (transitive) base verbs also find application in the analysis of particle and prefix-verbs. The SF-analyses take the form of specifying for a given particle or prefix-verb a syntactically structured tree, the leaves of which are either lexical elements or variables, and where each node is assigned a type built from basic types 0 for truth values and 1 for entities (of various ontological sorts). The type assignment must be consistent in that the type of the mother node is always the one resulting from applying the type of one of its daughters to that of the other one. (Branching is always binary.) The structures can be converted into SF-representations in which a complex functional form, obtained by writing out the functional application indicated in the tree and then prefixing this term with a sequence of λ -operators binding the variables occurring in the tree with the operators arranged in the reversed order mentioned above.

1.2 *Overview of the paper*

In the different parts of section 2 I will present selected examples from (Stiebels & Wunderlich 1994) and (Stiebels 1998) and compare the analyses they offer with analyses of my own.

My analyses involve two representations each, a syntactic tree built according to principles inspired by DM and a semantic representation in the form of a DRS-like structure which can be derived from the syntactic structure. I present both syntactic and semantics representations leaving open for the time being some of the details how the

³ Causal connectedness of sub-eventualities in resultative construction has also been discussed in (Bittner 1999).

second can be derived from the first. The selection of examples has been somewhat at random. But by and large, I have followed the progression found in (Stiebels & Wunderlich 1994). In the first part of the paper I will focus on verbs where the kernel predicates name event types, also referred to as 'manner of action or process'. In the second part the focus will be on de-adjectival and de-nominal verbs, following the demonstration of SF-principles in (Stiebels 1998).

2. 'manner'-verbs

2.1 *aufsteigen* and *aufpicken*

The simplest semantic contribution of a prefix or particle is (i).

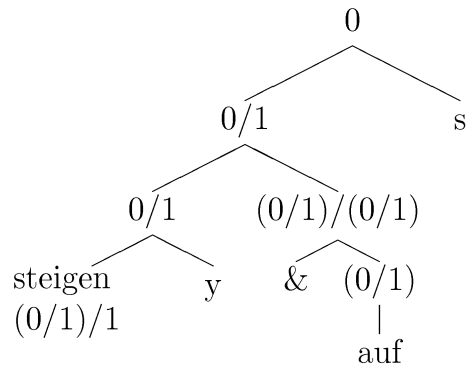
(i) **P is a one-place-predicate that can function as a verbal modifier.**

An example is the particle *auf* when used as in (3). Classifying *auf* as a modifier is compatible with *auf* historically being an adverb and also with the informal characterisation given in (Stiebels 1996)

- (3) der Drachen stieg auf
the kite ascended [up]
'the kite ascended'

The semantic Form of the complex verb is presented in (4)

(4)



As indicated in (4) SF analyses verbs as having a situation argument. (In (4) this situation is represented by the variable *s*.) Furthermore, the particle *auf* is analysed as a predicate of situations as well and the way it combines with the base verb *steigen* is analysed as predicate conjunction. This is one way of expressing the kind of predicate modification that is typical of adjunctions, but here the operation is expressed by the polymorphic conjunction operator '&', which in (4) acts as a conjunction of one-place predicates (expressions of type (0/1)). By treating '&' as combining & first with the right and then with the left conjunct one achieves the asymmetry that enables SF to make an 'embedding depth' distinction between variables occurring in the right and variables occurring in the left conjunct. The treatment of *auf* in (4) is a kind of '1-place preposition with some such meaning as 'nach oben' ('upwards') in the spirit of (Bierwisch 1988). Abstraction over the variables in (4), in the order indicated by their positions, yield the λ -term ' $\lambda y.\lambda s.(steigen(y) \& auf)(s)$ '.

There are some difficulties with this representation.⁴ The representation (4) predicts that *auf* meaning *upwards* could combine productively only with motion verbs. For a modifier meaning 'upwards' is expected to apply on base verbs only, if motion or at least direction is implied by it already. And indeed, Wunderlich and Stiebels claim, that "all productive uses of particles are sensitive to the semantic class of the verb." (cf. (Stiebels

⁴ With one of difficulties I will deal in (Roßdeutscher:subm)
It fails to capture two senses in which one can use the German verb *steigen* and which behave differently when combined with particles like *auf* and *ab* ('downwards'). The difference is indicated in the four sentences in (5). (5.a-c.) are fine, though (5.d) is ungrammatical.

- (5) a. der Drachen stieg (zum Himmel) auf
 the kite ascended (to the sky) [up].
 'the kite flew up to the sky'.
 b. der Mann stieg (zum Gipfel) auf
 the man ascended to the summit
 'the man climbed up to the summit'
 c. der Mann stieg (vom Gipfel) ab
 the man ascended from the summit [down].
 the man climbed down from the summit'
 d. * der Drachen stieg (vom Himmel) ab
 the kite ascended from the sky [down]

The explanations of the judgments in (5) will be given in (Rossdeutscher:subm).

& Wunderlich 1994:950)). However, the following list of examples cast doubt on that claim. In all cases in (6) *auf* contributes that the direct object moves upwards, still the base verb itself neither commits to motion nor to direction, compare (Lechler & Rossdeutscher 2009).

- (6) Samen aufpicken (to pick [up] seeds) ;
einen Stein (vom Boden) aufgreifen (to pick [up] a stone (from the ground));
aufsammeln [lit. to collect up] (to pick [up]);
Äpfel auflesen (to collect [up] apples);
Äste aufraffen (to collect [up] grub twigs;
Wasser aufsaugen (to suck [up] water);
Milch auflecken (to lick [up] milk (from the ground));
Milch aufschlecken (to lick [up] milk);
Blut auftupfen (to dap [up] blood);
Sauce aufdippen (to dip [up] sauce);
Steine aufklauben (to gather [up] stones);
Wasser aufwischen (to wipe [up] water)
Muscheln vom Boden aufsuchen [lit:to search] (to collect [up] muscles from the ground).

These complex verbs can only be understood as meaning that *auf* introduces a requirement for an upward motion in context which is part of some complex plan of the agent: the bird picks the seeds in order to move them upwards; a man grips the stone in order to move it from the ground, etc. But in contrast to e.g. *aufsteigen* (s. (5.a,b) in fn. 4 where *auf*'s requirement of an upward motion can be justified by the *steigen*-event, an event of an upward motion in (6) must be accommodated as part of a complex action. One part of this complex action is described by the core verbal predicate and interpreted as temporally preceding the motion required by the particle *auf*. Note that this is beyond what could be represented in SF-terms because there is only one variable, i.e. s(ituation), of which both properties in the SF-conjunction are predicates.

(7(i)(a,b) and (7(ii)(a,b) demonstrate how we yield this interpretation in the present word-syntactic framework. (7(i)(a,b) represent the structural tree-representations underlying the predication. The b.-part presents the unergative *picken* (to pick) which

has agents for its subjects, the a. wing the syntactic and semantic contribution of the particle *auf*. I assume here in accordance with Stiebels that particles contribute event properties. Particles must merge with structures denoting events. This restriction is encoded in such a way that the denotation of the phrase with the particle as its head is of the form

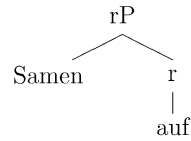
$\lambda e. \langle | \rangle$, see (7)(ii)(a) at the level of $r(\text{oot})P(\text{phrase})$.

- (7) Vögel pickten Samen auf
birds pick seed [up]
birds picked up seeds'

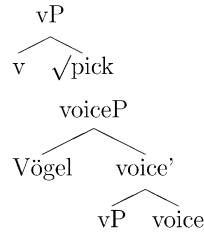
(7)

(i) structural elements

a.

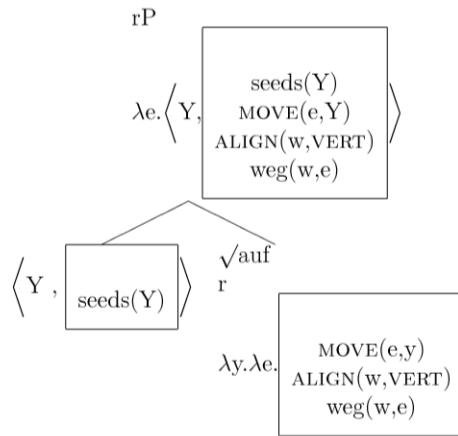


b.

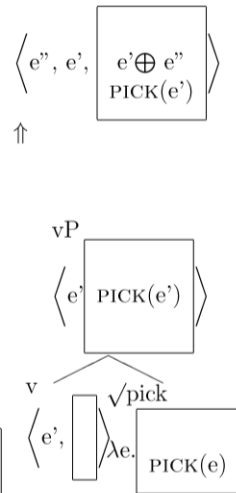


(ii) semantic interpretation

a.



b.

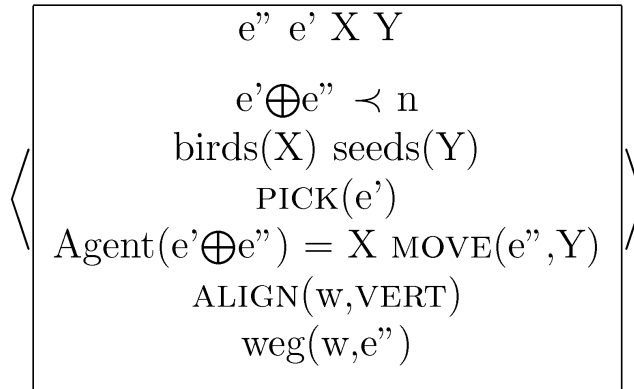


The particle *auf* selects a participant that undergoes upward motion. (Upward motion is represented with the help of ALIGNment of the event's path WEG(w) and the VERTical.) The particle *auf* has a λ -abstract for this argument slot in the r(oot) node in (7)(ii)(a)). The discourse referent Y, introduced by *Samen* satisfies this slot. Y enters a binding store to the left of the DRS that represents the particle and its argument. (The role of such a store will become clearer in the course of the paper.) (7)(ii)(b), below \uparrow , contributes the denotation of the verbal root $\sqrt{\text{pick}}$ as denoting an event type (manner) of an agent's action. The manner specifying event type is predicated on the referential argument e', which is introduced by the v-head.

In order to combine the contribution of the particle with the representation of the vP, the representation of the verbal head must be enriched. We accommodate an event e'' on the binding list to act as a target for modification by the particle *auf*. (I indicate the accommodation operation by \uparrow .)

In 'e'+e'' ' I display the discourse connectedness of picking and moving them upwards. It can be spelt out in detail to the effect, that the birds follow a routine plan where the seeds are both target of the picking action and the moving. After (a) the agent discourse referent enters the structure, (b) the event complex 'e'+e'' ' is bound as situated preceding the temporal indexical n, and (iii) the Y on the binding list is transferred into the DRS, we yield (8) for (7).

(8)



Although coherence is the decisive restriction of accommodation of events the construction principle doesn't restrict the contribution of the particle to predicate on the event described by the vP. Composition of particle construction following these rules is not a matter of functional application and composition but follow principles familiar from presupposition justification in DRT. The particle introduces the requirement of an upward motion in context, which must be accommodated if resolution isn't possible. The operation is constrained by principles of discourse coherence.⁵

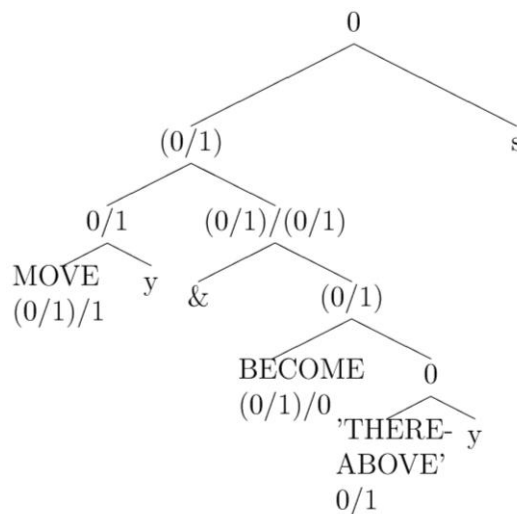
2.2. *hinaufgehen*

The second type of P-elements (Stiebel & Wunderlich 1994):

(ii) P is a one-place predicate that saturates an argument position of a verb.

(Stiebels/Wunderlich 1994) mention *hinaufgehen* as an example of that type. *Gehen* is analysed as a verb that subcategorises a directional prepositional phrase for (optional) argument, as in *auf den Berggipfel gehen*.

The Semantic Form of *hinaufgehen* would (to my best knowledge) be represented as in (9):



⁵ S. (Lechler & Rossdeutscher 2009) for more examples.

Abstraction over the variables y and s yields:

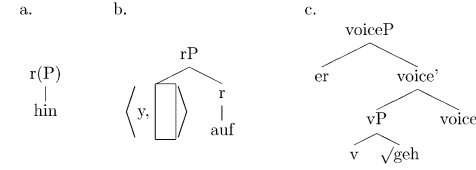
$$(10) \quad \textit{hinaufgeh(en)}: \lambda y. \lambda s. (\text{MOVE}(y) \ \& \ \text{BEC}(\text{'THERE-ABOVE'}(y)))(s)$$

In (9) the double particle *hinauf* is represented as contributing change into a one-place property of the theme; in any case it is seen as an dynamic spatial property of the theme. In (9) I tried to make the deictic elements visible in the notation with the help of 'THERE-ABOVE'(y). SF-Theory has no expressive power to represent the contextual binding of *hinauf* (lit:there-up) in context. That, of course, is not an issue of SF-theory at all. Still, I would like to make a case for this example to show how DRT-based semantics representation within a root based account deals with the complexity of predication in this type.

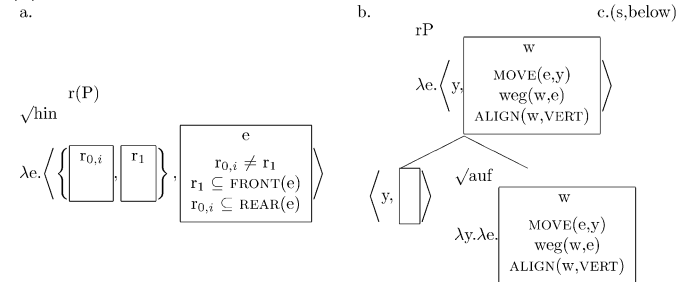
- (11) (Im Zimmer im ersten Stock brannte Licht).
 Der Mann ging hinauf.
 the man went [hin][auf].
 'In the room on first floor there were some lights. The man went up there.'

In (12)(i)(a,b,c) I display the structural elements. Their semantic interpretation is presented in (12)(ii)(a,b,c).

(i) syntactic sub-structures



(ii) semantic interpretation

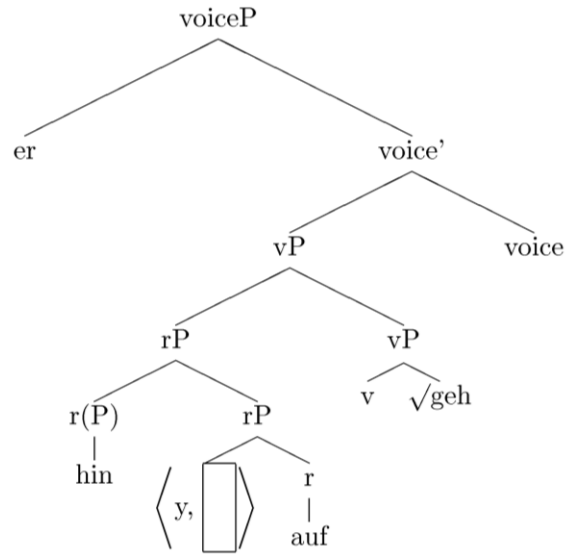


The anti-indexical particle *hin* is represented as an event property which requires two spatial reference points: One indexial $r_{0,i}$ in the rear of the event modified by *hin* and another, r_1 , in its front.

As already shown in (7)(ii)(a) the particle *auf* has an argument slot for something that moves upwards. In the context of the double particle construction this slot isn't filled immediately by a discourse referent with a description (such as *Samen* above) but is satisfied by a silent discourse referent $\langle y \mid \mid \rangle$ by conversion. y ends up in the STORE or binding list, awaiting unification with a theme or agent of the upward motion e .

MERGE of the double-particle construction is MERGE of the two $r(\text{oot})P$ s to a further $r(\text{oot})P$ which adjoins to vP , see (12').

(12')



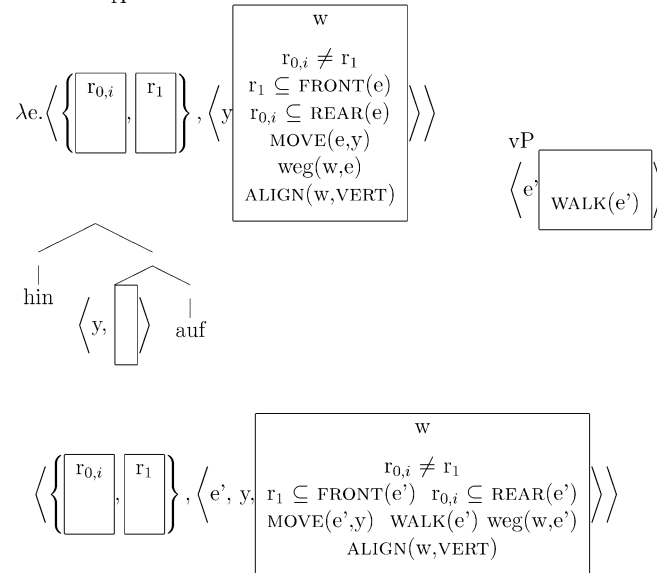
(13.d) shows the semantic operations during MERGE of the particles *hin* and *auf*. The two structures are combined by unification. The event predicate ' $\lambda e.hinauf$ ' inherits both its presuppositional requirements and all binding requirements from the merged particle nodes of the double particle construction. MERGE of the nodes of *hinauf* in d. and in c. yields (13.f).

(13)

d.

rP

e.

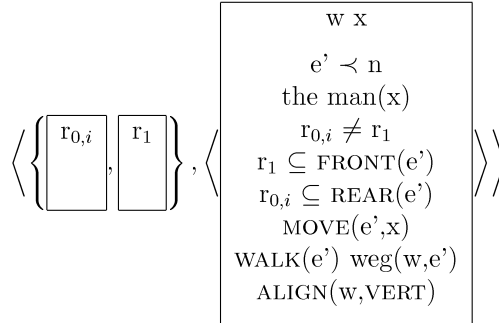


Merging the vP with voice and introducing the agent x in spec voiceP leads to x entering the binding list, too. y and x are unified; thereby the participant $\langle y, | \rangle$ (consisting of an individual y, which has no description) which is selected by *auf*, yields the description 'a man'.

(We will see more examples of unification of discourse referents below.)

We end up with a sentence representation (14). In (14) the binding list is empty. The discourse referents in the presupposition $r_{0,i}$ and r_1 must be justified in context. The anti-indexical and anaphoric reference r_1 point will be resolved in the description *Zimmer im ersten Stock*. $r_{0,i}$ is a deictic reference point (either speech location or spatial perspective point), which is in the rear of the motion and on the ground.

(14) der Mann ging hinauf



More about double particle constructions can be found in (Rossdeutscher 2009).⁶

2.3 *einlaufen*.

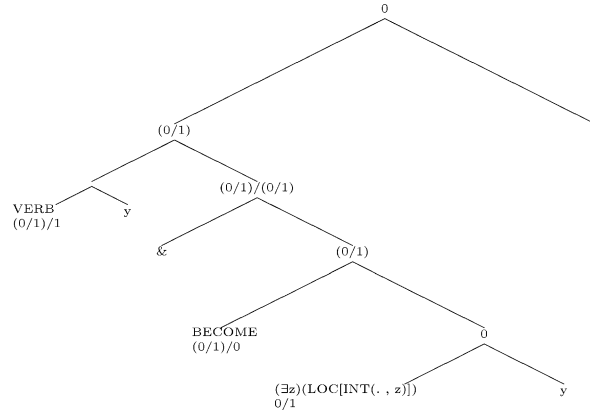
(iii) **P is a two-place-predicate that can saturate the argument-position of the verb, given that the internal argument of P may remain implicit.**

The complex verb *einlaufen* as in *die Athleten liefen ein* is an instance of pattern (iii). The SF representation is (16).

⁶ It has been claimed that *hinein* has an argument blocking effect, presenting sentence predicates like
(15) Der Prinz lief (* in die Küche) hinein
the Prinz ran (in to the kitchen) [therein]

I do not share the judgement that (15) with the prepositional phrase in combination with *hinein* is ungrammatical. I rather believe that both specifications are unexpected to appear in the same sentence, for the anaphoric reference point would be bound in the same sentence. It is hard to construct contexts motivating such a choice of predication.

(16)



The representation relies on existential binding of the most deeply embedded variable z . *ein* marks a dynamic property: $\lambda u.Ez \text{ BECOME}(\text{LOC}(\text{INT}(u,z)))$ (or the original notation: $\text{BECOME}(\text{LOC}(y, \text{INT}[z]))$)

Abstraction over y and s yields

(17)

einlaufen: $\lambda y.\lambda s.Ez (\text{MOVE}(y) \ \& \ \text{BECOME}(\text{LOC}(y, \text{INT}[z])))(s)$

The existentially bound variable z represents the denotation of *das Stadion* in

(18) die Athleten liefen in das Stadion ein
 the athletes ran into the stadium [ein]

The theory is silent about how this identification comes about, but this might come out straightforwardly: *ein* saturates an argument position and the PP is an adjunct. From the point of view of word-syntax the status of *ein* and the PP are on a par.⁷

⁷ There is a difference, however, concerning the selection restriction of the silent reference object z , selected by the particle *ein*. Not only must it have an interior (otherwise it wouldn't be unified with the PP argument), the restrictions are stricter. As far as I can see these must be 'public place', stadiums, rooms inhabited by person as in *in ein Zimmer eintreten* (to enter a room), *in den Hafen einlaufen* (to enter harbour); but garages, sheds, etc., are not selected. *Er fuhr in den Schuppen ein* is odd. These restrictions concerns semi-productivity of particle verbs and are beyond prediction of either framework, rather a

2.1.3.

In my analysis I will make use of the idea, that both particles and prepositions are relational roots. They contribute a relation between participants of the described event. As they are relational, they license argument slots. (Like the (one) argument slot of *auf*-above, the argument slots of particles and prepositions will be represented by λ -terms, see (19)(ii)(a,b)).

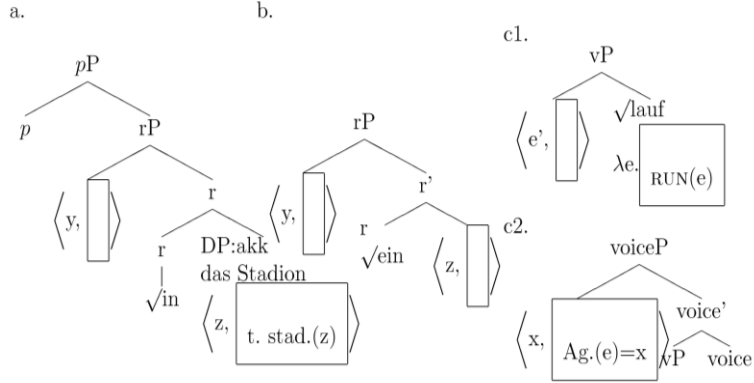
In prepositional phrases the selected argument in the argument position is always realized; moreover it is case marked. In recent papers (e.g. cf. (Svenonius 2004)) this difference has been made explicit in assuming a functional projection which licences the relational root, i.e. the preposition, to case mark its argument. I adopt this idea by way of marking the head of that functional projection by p . Particles lack the p -projection. Generally not all arguments (neither in argument position nor in specifier positions) need to have descriptions. The structure (19)(i)(b) headed by *ein* excludes both positions from bearing descriptions. I present these discourse referents to the left of an empty DRS. Empty DRSs represent a lack of description⁸.

- (19) die Athleten liefen in das Stadion ein
 the athletes ran into the stadium [in]
 'the athletes entered the stadium'

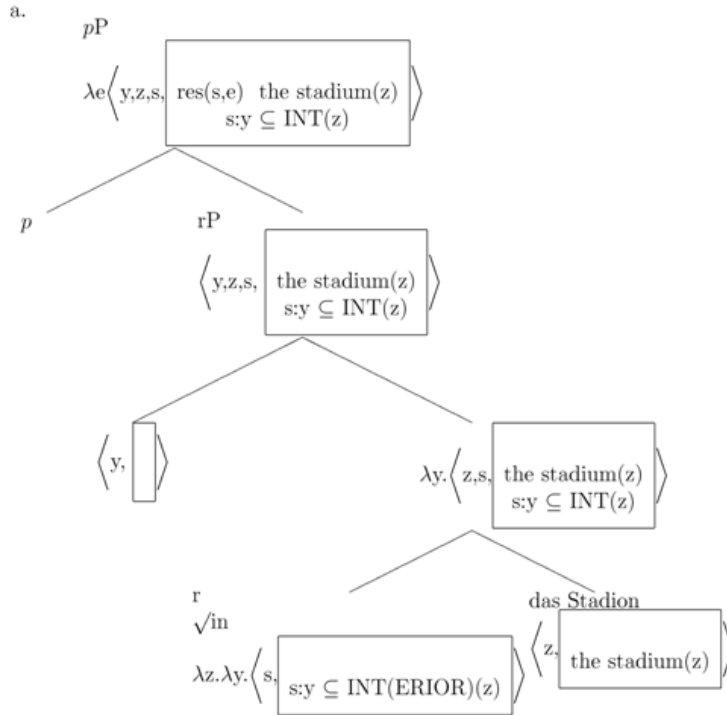
problem of production than of interpretation.

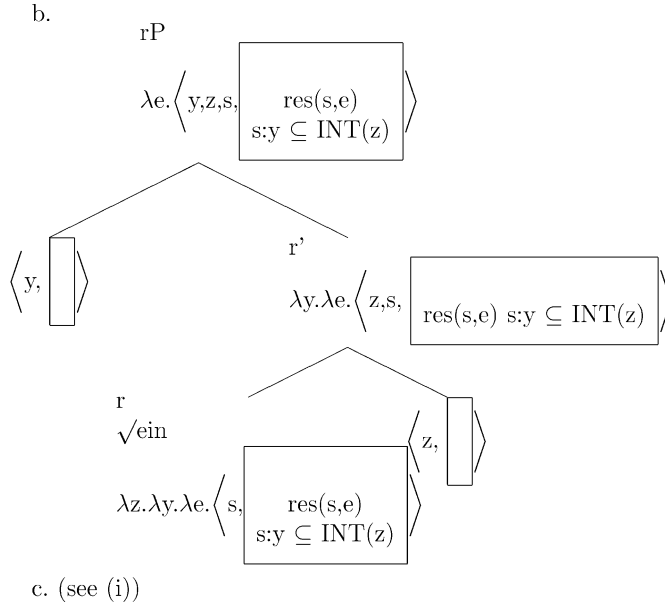
⁸ From this follows that **die Athleten liefen das Stadion ein* is ungrammatical. There is no position but the case marked argument position of *in* in (19)(1)(a) where the goal-DP may enter syntactic structure.

(i) structural elements



(ii) incremental semantic interpretation of the structural elements



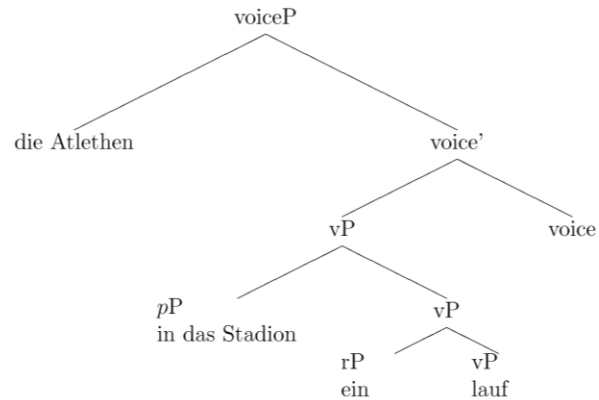


(19)(ii)(a,b) demonstrates the creation of argument slots by relational roots: The creation of a slot is represented by λ -abstraction over the roots' relata. This principle has the consequence of constraining structure building in such a way that conversion must take place in the next step of MERGE. During conversion the argument slot, i.e. the placeholder abstracted over, becomes saturated by the discourse referent which functions as the referential argument of a DP-description or by a discourse referent without description. That referent enters a STORE or 'binding list'. All elements on that list require binding. There are various ways in that binding of elements in the store can take place. In this paper I will only present a few of these ways. In whatever way binding occurs, all binding requirements must be consistently specified on sentence level --- either they are resolved or else the requirement is specified for being resolved in context.

When the structures (19)(ii)(a) and (19)(ii)(b) both merge with the vP-representation, the discourse referents on the binding lists of the sub-structures a. and b. become unified.

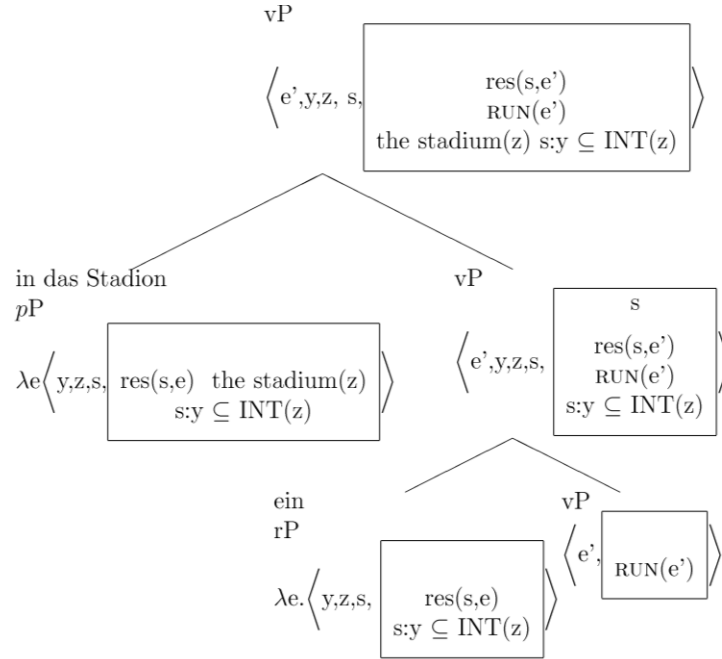
For instance the occurrence of *z* which has been introduced by the PP, and the occurrence of *z*, which is the silent argument of the particle *ein*, are unified. This makes the intuition formally explicit that the preposition and the particle share the discourse referent of which they explicitly or implicitly speak.

Coming to MERGE of the sub-structures (ii)(a,b,c) an underlying syntactic structure of the vP as a whole has to be assumed. Let's assume the following structure:



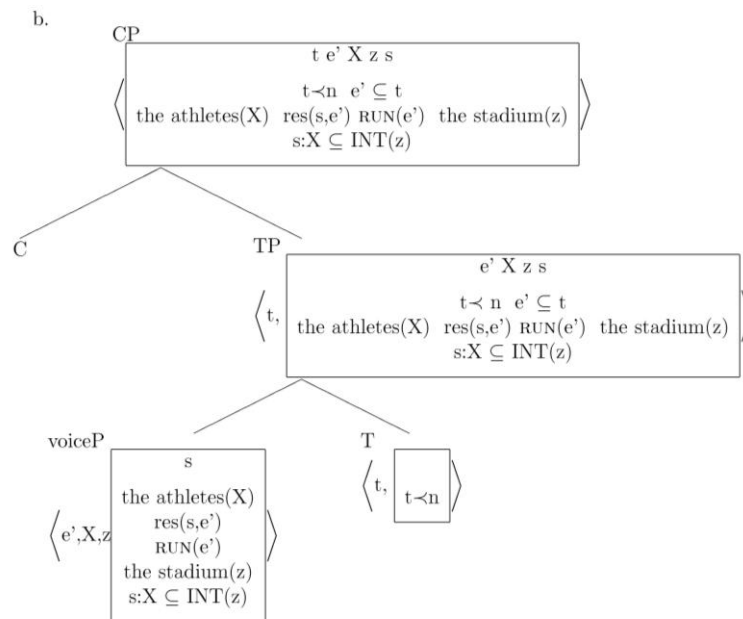
First the rP headed by the particle is merged with vP. Thereby the event property becomes saturated via predication on the referential argument. The other two argument discourse referents are added to the store. Secondly, the prepositional phrase is adjoined to the modified vP. Again we have predication of the event type. Now, the discourse referents *y* and *z* introduced by the prepositional phrase are unified with the discourse referent introduced by the particle head, thereby the silent *z*-argument of *ein* becomes specified. The other conditions are unified as well.

(20)



I do not want to exclude the possibility that there may be other ways of merging the structural elements. E.g. the pP , a ., and the particle structure, b ., might be merged first and then merged with vP . It will not make a difference for the semantic concerns of this paper. In any case the principles guarantee a sentence representation as in (21.b) (t is the 'location time', n is the indexical temporal perspective time.)

(21) a. die Athleten liefen in das Stadion ein

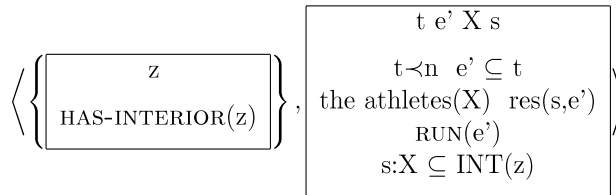


It is worth noting that in the semantic representation of (22) below the discourse referent z will not have gained a description in the course of interpretation. It has to be represented as being contextually bound, that is to say (22) is felicitous in contexts only where an antecedent of z is salient in context.⁹

There are various ways to formalise this contextual requirement. I decided to represent it as a presupposition. (Presuppositions are displayed in a presupposition set to the left of the assertion DRS.)

⁹ We could speculate that it is this property that makes a speaker select a description were the PPs is lacking.

(22) Die Athleten liefen ein



2.4. anstreichen

The next type of pre-verbs P on the agenda from (Stiebels & Wunderlich 1994) is as follows.

(iv) **P is a two-place predicate that can saturate an argument position of V so that the internal argument of P becomes the direct object of the complex verb.**

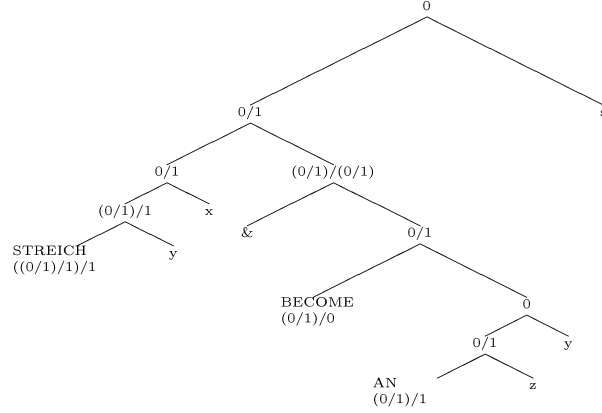
I chose (23) for an example for illustrating the sort of alternation in argument structure that Stiebels and Wunderlich have in mind.¹⁰

- (23) a. Farbe an die Wand streichen
 paint on the wall paint
 'to apply paint to the wall'
- b. die Wand mit Farbe anstreichen
 the wall with paint [an]paint
 'to apply paint to the wall'

The Semantic Form for the first alternate (23.a) and the second (23.b) is the same, see (24); the difference comes in by different ways of abstraction (25) and (26).

¹⁰ In contrast to Stiebels and Wunderlich I do not believe that *auf in den Tee aufgießen* (to make tee) has a topological meaning. *Auf* means 'upwards' here. The pouring water onto the tee-leaves makes them move upwards.

(24)



Abstraction for (23.a) yields

(25) $\lambda P.\lambda y.\lambda s.(\text{STREICH}(x,y) \ \& \ P(y))(s)$, where P is $\lambda u.\lambda z.(u, \text{AN}[z])$.

The abstraction for (23.b) is

(26) $\lambda z.\lambda y.\lambda x.\lambda s.(\text{STREICH}(x,y) \ \& \ \text{BECOME}(y, \text{AN}[z]))(s)$

The linking theory predicts that the y -argument, λy , will not qualify for a structural argument, because it is not the most deeply embedded argument (which is z) and not every occurrence of y L-commands z . According to the linking theory referred to in the introduction, y will not be realised in accusative case. The y -argument can still be realised in oblique case, i.e. in a *mit*-phrase.¹¹

¹¹ One must be cautious, however, that the internal argument of the *mit*-PP really instantiates hidden arguments in the particle construction or the prefix-verbs. In cases of the type *sein Geld mit Zigaretten verrauben*, contra Stiebels and Wunderlich, the *mit*-Phrase in this example must be interpreted housing a disguised event-description. *Zigaretten* is not the internal argument of the VP *Zigaretten rauchen*. We must reconstruct *Zigaretten* in *sein Geld mit Zigaretten verrauben* as *sein Geld mit dem Zigaretten-Rauchen verrauben*. I will not go into prefix-verbs of the *ver*-type in this paper and refrain from comparison.

2.4.1.

Different from Stiebels and Wunderlich my analysis of the particle constructions does not draw on any transitive *streichen*, *schreiben*, *gießen*, etc. but is based on intransitive *streichen*.

Naturally, no mechanism is necessary to explain any demotion of the internal argument by linking mechanisms of any kind. It is simply not there in the onset of the composition. In building non-core-transitive verbs on the basis of intransitive verbs we follow recent research in focusing on the different nature of core-transitive and non-core-transitive verbs. What is more the differences are crucial for the explanation of *-ung*-nominalisation, (see Hypothesis 1 from (Rossdeutscher & Kamp 2010)).

Hypothesis 1: Verbs with a bi-eventive structure allow for corresponding *-ung* nouns, verbs with a mono-eventive structure do not.

According to (Kratzer 2000) non-core-transitive verbs pass the *und*; *und*-test (s. (28) and also have resultative constructions (s. (30)).

- | | | |
|---------|--|-----------------------------|
| (28) a. | Sie strichen und strichen | * Streichung (der Wand). no |
| | 'they painted and painted | |
| b. | Sie schmierten und schmierten | * Schmierung. no |
| | 'they smeared and smeared' | |
| (29) a. | *Sie beschmutzen und beschmutzen | Beschmutzung. o.k. |
| | 'they dirtied and dirtied' | |
| b. | * säuberten und säuberten | Säuberung des Hauses. o.k. |
| | 'they started cleaning the house... and...and' | |
| (30) a. | weil sie die Hauswände vollschmierten, | resultative with 'full' |
| b. | * weil sie die Hauswände vollbeschmutzen, | |
| c. | *weil sie die Hauswände reinsäuberten | |

Facing (28.a) we have to conclude that there are intransitive uses of non-core-transitives like *schmieren* but there aren't in core-transitives in (29). Note that intransitive uses of non-core-transitive 'base verbs' are not predictable from entries like that in the theory of Semantic Form, see the grid in (25) for *etwas an etwas streichen*.

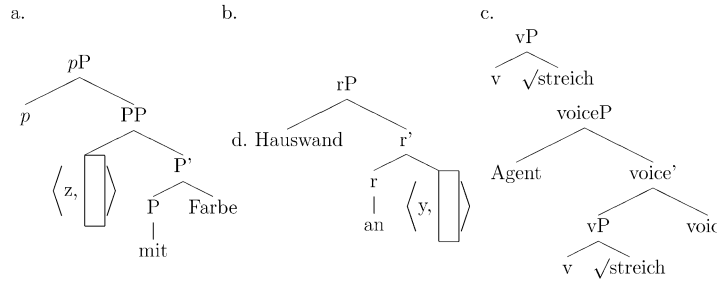
I take it that (31.a.b) can also be considered an instance of (iv) in the sense of Wunderlich and Stiebels. I add the predicate *rot*, which, if (31.a,b) are true alternates should be represented as modifying the y-argument. I will argue later, that there is a straightforward way to represent this modifying relation in a word-syntactic framework.

- (31) a. rote Farbe an die Tür streichen
b. die Tür (rot) anstreichen

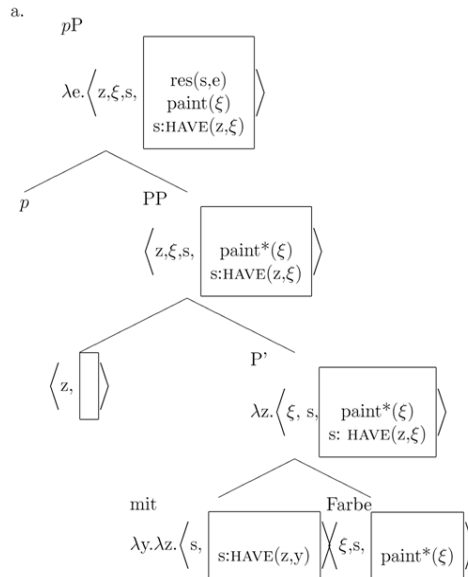
2.4.2.

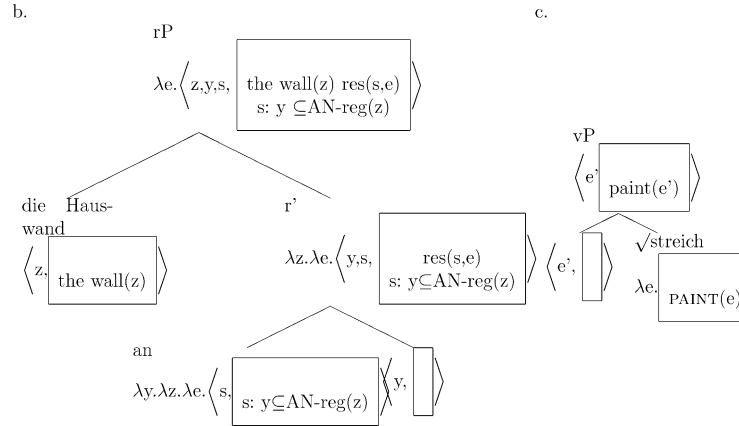
- (32) die Hauswand mit Farbe anstreichen

(i) structural elements



(ii) semantic interpretation





As the semantics construction follows the same principles like (20) I omit it.

2.5. *anlesen*

Category (v) in (Stiebels & Wunderlich 1994) concerns particle verbs as aspectual operators. They are reconstructed as functors.

(v) P is a functor on V.

An in as in (33.b) is interpreted as operation on the meaning of (33.a) to the effect that the event described in (33.a) is incomplete. (Stiebels & Wunderlich 1994) take it as a characteristics that argument structure in the transitive 'base verb' and its particle alternates is identical. There seems to be merely an aspectual difference in the complex predicate in comparison with the simple 'transitive verb'.

But there is more to it than that.

- (33) a. den Aufsatz lesen
the paper read
'to read the paper'

- b. den Aufsatz anlesen
the paper [an]read
'to start reading the paper, to read parts of the paper'

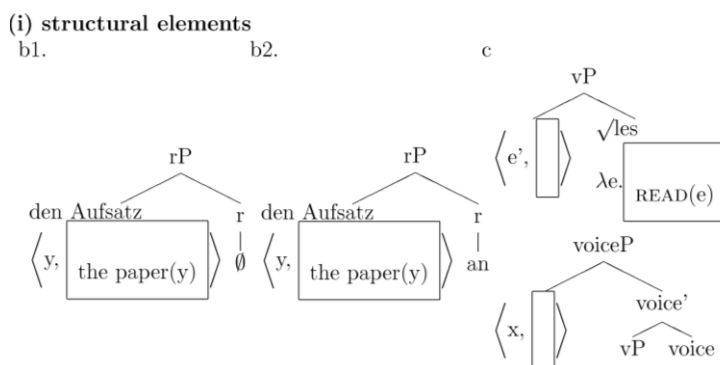
As Springorum (this volume) makes clear in her analysis, both predicates present the reading as culminating with respect to the denotation of the direct object. With (33.a) this means that the entire paper is read, whereas with (33.b) this involves parts of the paper: No part of the paper had been accomplished reading in the pre-state, but at least one has been accomplished in the resultant state in the alternate.

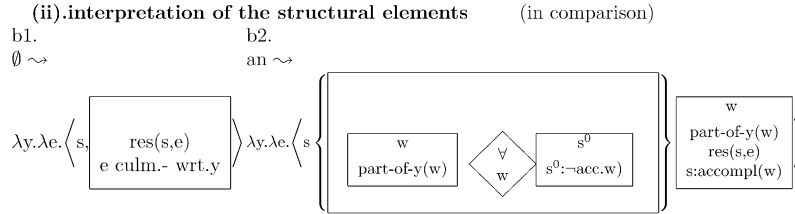
Within the framework pursued in this paper both transitive verbal constructions are mono-eventively constructed from the unergative *lesen* as its basis.

In (33.a) the culmination condition is due to 'pure' accusative. With non-core transitives of that type the accusative vP enters syntactic structure via a silent P-head (cf. (Marantz 2005), (Roßdeutscher & Kamp 2010)). The semantics of this P-head contributes the culmination-condition of the reading process. No root denoting an event type (manner root) ever contributes telic information. It is only adjoined phrases that may contribute telicity of non-core-transitive verbs. In (33.b) *an*, not being a silent, but an overt root, denoting a relation between the denotation of the argument *den Aufsatz* and the reading process, does a similar thing. So, under this perspectives, if *an* is an operator, it operates on the denotation of the argument, not just on the denotation of the event.

In (34)(ii)(b1) and (b2), I contrast the two relational phrases, which may both merge with vP in (34)(i)(c).

(34)





I close this subsection repeating that *aufblühen*, *aufweinen*, *aufschreien*, etc. must not be dealt with as marking ingression. *Auf* contributes that the event comes into the field of perception. Again, the particle is not just operator on event structure in these examples. (c.f. Lechler & Rossdeutscher 2009) for extended discussion of the pattern.)

3. Deadjectival verbs and de-nominal complex pre-verbs

3.1. simplex verbs

In (Stiebels 1998) the SF-theory of particle verbs and prefix verb is extended to verbs formed from adjectival or nominal sub-lexical items. For Stiebels de-adjectival and de-nominal verbs instantiate templates from universal grammar as follows.¹²

- (i) causative verbs: $(\lambda Q) \lambda y. \lambda x \lambda s (\text{CAUSE } x, \text{BECOME}(Q(y)))(s)$
- (ii) inchoative verbs: $(\lambda Q) \lambda y. \lambda s (\text{CAUSE } x, \text{BECOME}(Q(y)))(s)$

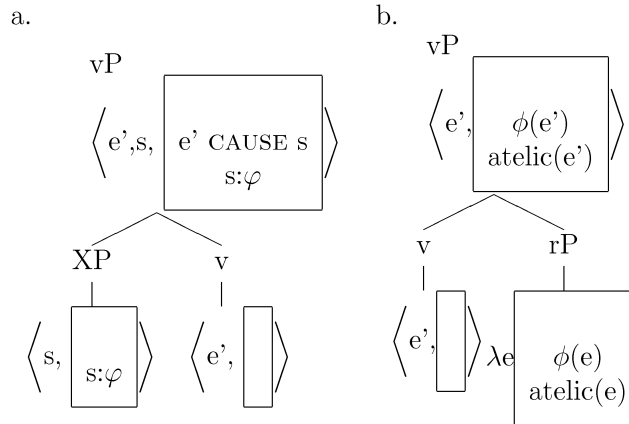
(cf. (Stiebels 1998):271)

The main difference between the SF-representations and the word-syntactic representations that we are pursuing is this: In the word-syntactic framework CAUSE is represented as a relation between two syntactic nodes. De-adjectival verbs and denominal verbs instantiate core-transitive verbs in the sense of (Levin 1999). I have shown elsewhere in (Rossdeutscher & Kamp 2010), (Roßdeutscher 2010) that they instantiate bi-eventive structures in word-syntactic frameworks, (cf. (35.a) from (Roßdeutscher & Kamp 2010). All particle verbs dealt with in this paper so far, are

¹² For sake of comparison I leave out the third. There are very different cases subsumed under this header anyway.

instances of mono-eventive structures, s. (35.b).

(35)



For de-nominal verbs (Stiebels 1998) provides representations like that for the simple denominal verb *bündeln* as in (36)

- (36) das Altpapier bündeln
the waste paper bundle
'to bundle waste paper'

According to (Stiebels 1998) the property *Q* of becoming a bundle, i.e. $\lambda y(\text{BECOME}(\text{bundle})(y))$ is expressed by the kernel predicate of the verb. The derivation instantiates (37), one of several templates provided by Universal Grammar. The verbal stem is treated as contributing an individual property.

$$(37) []_v + N \rightarrow [N]_v \lambda Q \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(Q(y)))(s)$$

In our word-syntactic framework under development the contribution of roots that, like nouns, name entities, are dealt with as contributing (i) a sortal property of, say, being a bundle and (ii) a binding requirement for a discourse referent that bears that property. The contribution is of the form $\langle z, | Q(z) | \rangle$. This treatment has proved suitable in explaining readings of de-verbal nouns. It turned out predictable for certain *-ung*-nouns

from de-nominal verbs to have entity-readings. (N.B. As predicted, though not obvious, *Bündelung* has an entity reading as well.)

The verbal predicate in (36) is analysed as bringing about an identity-like relation between the waste paper and an entity of the sort 'spatial configuration'. I refrain here from displaying semantics construction. The reader is invited to refer to (Rossdeutscher & Kamp2010) for further discussion) of examples of this formation type and how the readings of *-ung*-nominals are predictable from the construction.

I will end this sub-section by displaying the vP-representation of the predicate in (39)

(39)

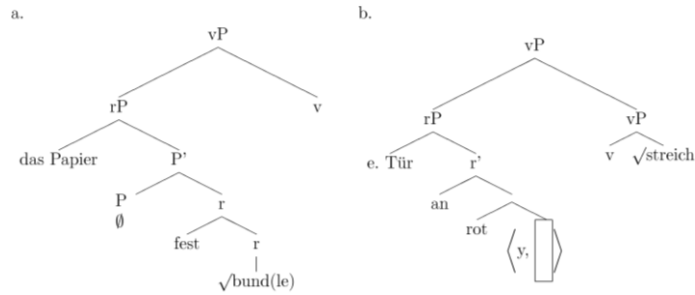
$$vP \rightsquigarrow \left\langle e', s, y, z, \begin{array}{l} \text{the waste paper}(y) \\ \text{BUNDLE}(z) \\ e' \text{ CAUSE } s \\ s: y '=' z \end{array} \right\rangle$$

The discourse referent z stems from the sortal root; the identity-like relation '=' is a relation between material objects and discourse referents denoting spatial configurations. The discourse referents that are possible denotations of the derived noun *Bündelung*, i.e. either e' or z , are among the set of entities in the binding list. (For further discussion on the restriction of reading of such nouns, see (Roßdeutscher 2010).

(40) shows correlations between the modifier *fest* ('firm') in a description of an event in (40.a) (where *fest* is an adverb); in what might be a description of an event or of an entity in (40.b) and finally in an entity description in (40.a). In all three cases *fest* is an individual property that modifies the root $\sqrt{\text{bund}}$, playing its role in all three descriptions. In a word-syntactic framework this unique relation can be syntactically represented as follows: the modifier *fest* is adjoined to the root $\sqrt{\text{bund}}$ and predicates to its referential argument a property. Further investigation is necessary to predict the formal properties of realising that property either as adverb or as adjective. A further task is providing rules of linear order in the different domains.

- (40)
- a. das Altpapier fest bündeln
the waste paper firmly bundle
'to make a firm bundle from the waste paper'
 - b. feste Bündelung des Altpapiers
firm bundle-UNG of the waste paper
 - c. ein festes Bündel
a firm bundle

Individual properties like $\sqrt{\text{rot}}$ interact with sortal arguments of particles. The semantics of *rot anstreichen* strictly imply this: the agent applies red paint to the door making the characteristic coating movements. (Again, gaining the correct word order is a challenge for an analysis along these lines.)¹³



¹³ It is worth noting that the resultative construction (41.a) and the construction (41.b) are different.

- (41)
- a. die Tür rot streichen
the door red paint
to paint the door red'
 - b. einen Fehler rot anstreichen
'a mistake red [an]mark'
to mark a mistake with a red line'

(41.b) is a bi-eventively constructed verb, as will become clear in the next few pages. $\sqrt{\text{streich}}$ contributes an entity root.

(This entity makes itself felt in *viele (rote) Anstreichungen* which has a reading where it means 'many (red) lines (marks)').

3.2. *de-nominal particle and pre-fix-verbs*

The SF-representation of particle and prefix-verbs in (Stiebels 1998) builds much on the work of (Kiparsky 1997) who formulated conceptual principles of treating de-nominal verbs within the framework of Semantische Form. (Stiebels 1998) joins Kiparsky in his critical remarks on the treatment of location verbs and locatum verbs in the word-syntactic framework in (Hale & Keyser 2002) and their previous publications.

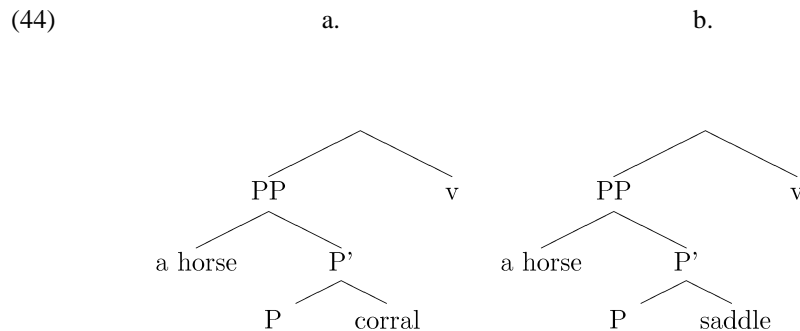
Kiparsky, following the SF-treatment of incorporation, stated the following rule:

Only the lowest (the most deeply embedded) thematic role can be "incorporated", i.e. expressed by the noun of a denominal verb.

The word-syntactic derivation of (Hale & Keyser 2002) presented in (44), assumed two silent prepositional heads to establish the respective spatial relations: 'terminal coincidence' (with locatum verbs) and 'central coincidence' (for location verbs).

- | | | | |
|------|----|--|---------------|
| (42) | a. | to corral a horse | location verb |
| | b. | eine Tasche / eine Last schultern
a bag / a burden shoulder
'to put a bag on a shoulder' | |
| | c. | ein Möbelstück kanten
a piece of furniture rim
'to bring a piece of furniture into a position where it rests one of its rims ' | |
| (43) | a. | to saddle a horse | locatum verb |
| | b. | einen Platz pflastern
a square pave
'to pave a square' | |
| | c. | einen Wagen laden
a wagon load
'to load a wagon' | |
| | d. | eine Schulter belasten
a shoulder bei-burden
'to weight a shoulder' | |

The word-syntactic representations of (42.a) and (43.a) are of the form (44.a)¹⁴ Germ. (42. b,c) are of the same structure as (42.a). (43.a,b,c) is like (44.b). (43.d) is analogous to (43.c), except that we have a de-stressed preposition *bei* (cf. (Roßdeutscher & Kamp 2010)).



(Kiparsky 1997) had made the case, however, that the difference between location and locatum verbs is a matter of two genuinely different semantic relationships, giving rise to two different SF-representations HAVE-ON, a generalised possession relation and a genuine locative relation BE-ON/IN- relation, following the relatum/relans order as in prepositional phrases like 'a horse in the corral' Evidence for the possession relation in locatum verbs is taken from paraphrases like "The horse has a saddle on" ¹⁵ and there is collaborative evidence from case marking in Finnish.

As shown in (44) modelling incorporation in the word-syntactic framework has been made explicit in terms of head movement. The kernel predicate in the argument position of P moves to P (its governor) and P moves to the verbalizer v. Naturally in both frameworks the semantics of the P element is decisive for which predicate incorporates: In the word-syntactic approach it is the item in argument position, in the framework of

¹⁴ The representation is meant for the German verbs, where v is represented to take arguments to its left. The order is of no further importance.

¹⁵ As for German this paraphrase is valid only, if dative cases is also licensed, see *er setzt sich einen Hut auf* with corresponding *er hat einen Hut auf* vs. *er legt dem Pferd einen Sattel auf* and infelicitous *# das Pferd hat einen Sattel auf*. I assume that it is the POSS-Relation in the logical Form of the predicate that both licenses dative and the HAVE-relation.

Semantic Form the most deeply embedded argument.

Serious doubts about the word-syntactic solution arose in connection with examples that are ungrammatical in English but well-formed and moreover frequent in German: (Hale & Keyser 1993) explained the ungrammatical construction of the type (46) as a violation of syntactic principles¹⁶

(46) *We corralled the horses in.

Since then Hale and Keyser changed their theory of incorporation (or 'conflation', cf. (Hale & Keyser 2002). They still assume that (46) is ungrammatical because the preposition isn't silent and introduces a binder between the noun *corral* and the attracting v-head which disturbs the binding relations that hold when it is absent. From what Hale and Keyser discuss on prepositional heads (Hale & Keyser 2002) it does not follow that this 'disturbance' also holds for *de-stressed* prepositions in German. Anyway, in the DM-tradition (cf. (Marantz 1988) I see no conflict with general assumptions on MERGE of roots. The structure obeys the Head Movement Constraint (cf. (Baker 1988)) as soon as one assumes that P head selects for sortal root in its argument position and v selects the PP.

Regarding McIntyre's remarks, I would like to point out that what happens in prefix-verbs like *belasten*, *unterkellern*, *überbrücken*, etc. is of a different nature compared to what is going on in (impossible) particle verbs such as Engl. (46) or Germ. particle verbs like those cited in (45), fn. 16.

In the next subsection I will argue for structural differences between particle verbs and

¹⁶ I cite (McIntyre 2001):36 referring to this explanation as follows:

[The authors] propose that the construction is ruled out because the incorporation of the of the object of the P-element into a higher abstract verb would yield an ECP-violation since P is a closer governor. Although such English particle verbs are rare (if not non-existent *slot in*, *fence in*), German has abundant counterexamples (cf. the pv-verbs in (45)). Hale and Keyser would have to assume, that the noun incorporates into the governing P-head, which subsequently incorporates into the a zero verb. This is analogous to the derivation of *shelve* [...] except that in German the P is overt. However, if this is possible for German, why is it ruled out for English? Furthermore, why does the P-element strand, when the rest of the verbs moves to forwards ?

(45) [...], einbunkern, eindosen, eingemeinden, einglasen, einkäfigen, einkellern, einkerkern, einsacken, einschulen, eintüten

prefix verbs which may be connected with phonological contrasts between stressed and de-stressed. Moreover, I will make the case that even for analysing particle verbs as cited in (45), fn. 16 we must assume at least three syntactico-semantic sub-types.

3.2.1. bi-eventive : *ein-zäunen*, *ein-kellern*, and *ein-kesseln*

Among the rare Engl. examples where predicates of the form (46) are well-formed in English, McIntyre cites *to fence in*, corresponding to (47.b). One example of the same type is (48.a). These verbs can be used felicitously only, if the denotation of the sortal root is brought about during the event. (47.c) is ungrammatical if it describes the cattle going from outside to inside a pre-existing fence (like the cattle from outside a corral to inside of the corral. It would be acceptable only in the situation of a fence being built around a stationary herd.)

- (47) a. The farmers fenced the land in
 Die Bauern zäunten das Land ein
 the farmers fence the land [in]
 'the farmer erected a fence around the land'
- b. * Die Bauern zäunten das Vieh ein
 the farmers fence the cattle [in]

In the same vein (48.a) is fine, describing the action of drawing a little box, so that the figure ends up inside the drawing. But this cannot be described as Engl. 'to box the figure', because there is no box at the start of the action. On the other hand Germ. (48.b) is odd, because if you box a gift, the box is already there and the gift is put inside.

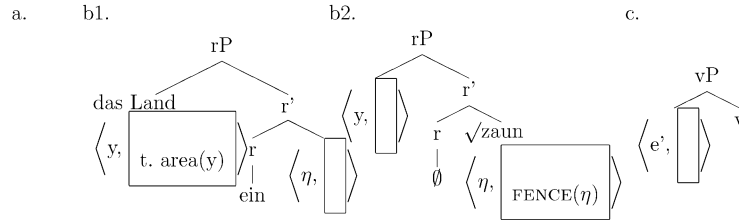
- (48) a. Er kästelte die Figur ein
 he boxed the figure [in]
 'he drew a box around the figure' (≠ he boxed the figure)
- b. * Er kästelte das Geschenk ein
 he boxed the gift [in]
 intended meaning: 'he boxed the gift'

If these observations are not incidental, they would suggest, that if (46) would mean 'to build a corral around the horses' (46) could be grammatical. Whether this dimension is decisive in Engl., I cannot say. However, the dimension is decisive for the semantics of

the German constructions, as will be shown later.

The syntactic representation of Germ. *einzäunen* is rather complex. It involves two preposition-like heads, the overt particle *ein* and a silent prepositional head that we are familiar with from simplex de-nominal verbs like *pflastern*, (from $\sqrt{\text{pflaster}}$, 'pavement') *laden*, (from $\sqrt{\text{lad}}$ 'load', *kleiden* (from $\sqrt{\text{kleid}}$ 'dress'), etc. The structural elements for (47.b) are presented in (49).

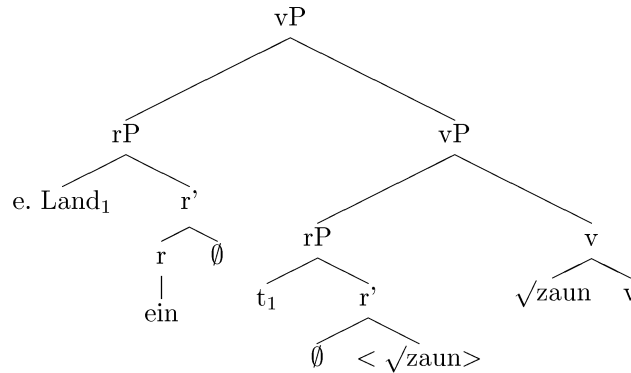
(49)



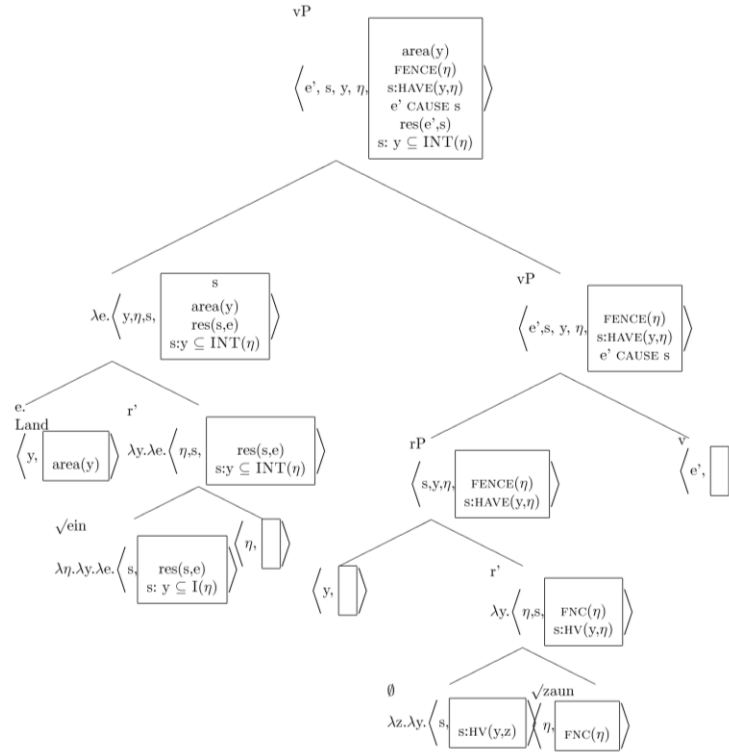
I display MERGE of respective root phases in (51). As for merging the structural elements I assume here that the rP with the silent head is combined with *v* to build a vP as (*etwas*) *zäunen*. According to (Grimm &Grimm: 2007) *zäunen* existed with the meaning of erecting a fence. It exemplifies a bi-eventively constructed verb. The noun *Zäunung* existed as well. The DP *ein Land* is placed in the specifier position of the particle phrase. This is a positions where the DP may be structurally case marked.

The structure also yields the correct word order with the particle adjacent to the verbal head as displayed in (50).

(50)



(51)



The semantics constructions needs no particular explanation. The principles involve saturation of argument slots of relational heads with silent and overt arguments, gathering them in the store and unifying shared arguments. The structure predicts that there is an entity-reading of *Einzäunung*: its denotes a fence; the variable of which is introduced by the sortal root $\sqrt{\text{zaun}}$.

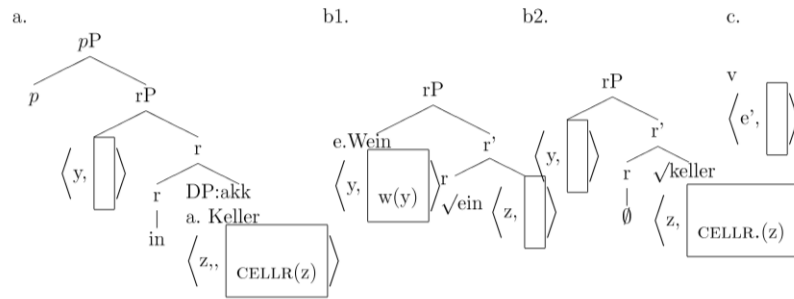
A predication type that is akin to (47.b) is exemplified in (52)

- (52) Weine in den eignen Keller einkellern
 wine in one's own cellar [ein]cellar
 'to store wine in one's own cellar'

The structural elements are like (49). Here the particle *ein* shares structure with an *in*-phrase in accusative.

(53)

(i) structural elements



The incremental interpretation is analogous to that in (49), except that the silent root in (53.b2) denotes a BE-IN/ON'-relation which applied in word-syntactic representations of the type (42.a,b,c), see (54).

(54)

$$\lambda z. \lambda y. \langle s \mid s: y \subseteq \text{INTERIOR}(z) \rangle$$

According to (Grimm &Grimm:2007) there also existed a verb *kellern*, a location verb. It meant 'to store something in a cellar'. One gets the impression that there had been more simple location verbs beside *lagern* (from $\sqrt{\text{lager}}$ (to store); *kanten*, from $\sqrt{\text{kante}}$ (rim); *landen*, from $\sqrt{\text{land}}$ (land); *schultern*, from $\sqrt{\text{schulter}}$ (shoulder) *stranden* from $\sqrt{\text{strand}}$ (strand), etc.. Nowadays these de-nominal verb pattern with particle constructions such as *einlagern*, *aufkanten*, *anlanden*, *aufschultern*, etc.

I forego displaying the semantics construction in this case because the construction is analogous to (51).

There are also cases somewhat in between (47.b) and (52): In (47.b) it is the denotation of the sortal root itself that is brought about; in (55) it is the region denoted by the root $\sqrt{\text{kreis}}$, or $\sqrt{\text{kessel}}$ The police rides in circles or makes a circle by standing next to

another, to the effect that the participants in the public protest end up in a circle or caldron.

- (55) die Demonstranten einkreisen / einkesseln
 the protesters [ein]circle / [ein]caldron
 to force protesters to stay put in a circle / caldron'

3.2.2. mono-eventive *einsacken*

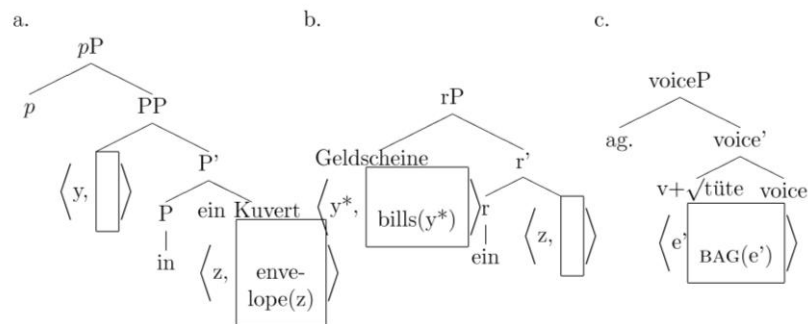
There is a class of *ein*-particle verbs the elements of which do not have *ung*-nouns. One of them is *die Kartoffeln einsacken* (to bag the potatoes). There is no **Einsackung*. Structurally alike examples are presented in (56).

- (56) a. Die Bauern pferchten das Vieh (in lichtlose Ställe) ein
 the farmers corralled the cattle (into dark stables) [in]
 'the farmers penned in the cattle in dark stables'
 b. Der Angestellte tütete die Geldscheine (in Kuverts) ein
 the employee bag the bills into envelopes [in]
 'the employee put bills into envelopes'

The structural elements are presented in (57).

(57)

(i) structural elements



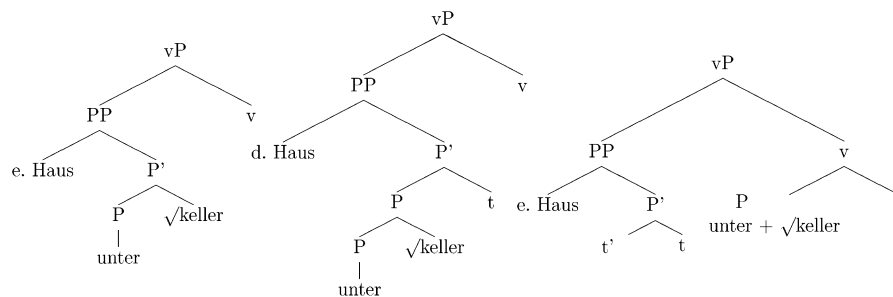
The nominal root $\sqrt{\text{tüte}}$ (paper bag) enters the structure contributing manner of action. It denotes an event type characterised by some prototypical finger movements made when objects are put into small bags made of paper or cellophane. Typically the material objects are paper themselves, but the verb *eintüten* is also used when samples of materials are put into a little bag, for instance for chemical investigation. In contrast, placing collections of goods that you carry home in carrier bag from your grocery cannot be described by *eintüten*. The semantics construction closely resembles that of *in das Stadion einlaufen* and is therefore omitted.

3.3. (bi-eventive) prefix-verbs: *unterkellern*

Deviating from the procedure I have followed so far, I first present my own representation of the next verb *unterkellern* but will defend it only after presenting Stiebels' solution.

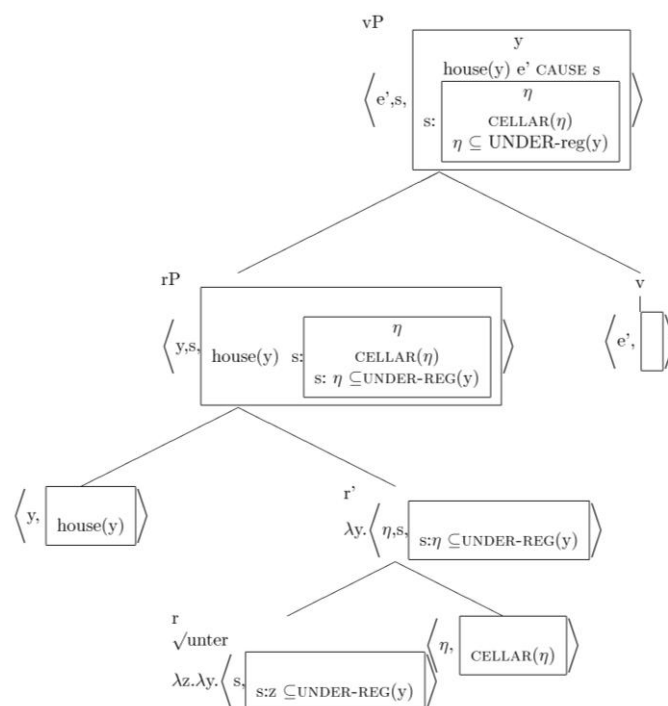
As alluded to above the complex word is formed involving two steps of head movement, s. (58).

- (58) ein Haus unterkellern
 ein house [under]cellar
 'to provide a house with a cellar'



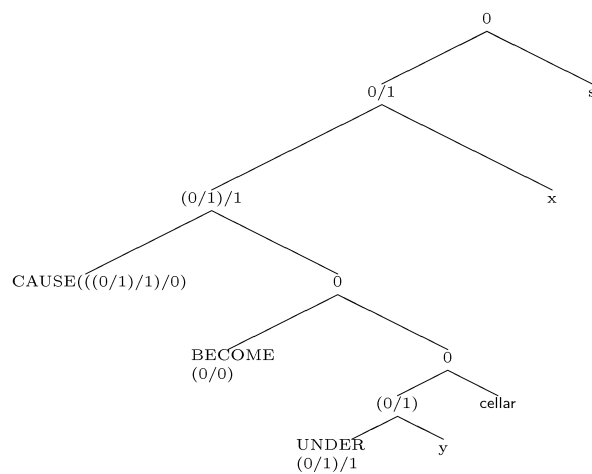
The semantics construction is as simple as this:

(59)



This is exactly the sort of representation (Stiebels 1998) rejects. To be precise, she rejects the SF-solution (60).

(60)



Stiebels must reject this solution because it is in conflict with Kiparsky's dictum that only the most deeply embedded variable can be realised by an incorporated expression. The conflict arises, because the contribution of the head $\sqrt{\text{unter}}$ is represented as in prepositional PPs. No problem would arise if only the variable y and the 'nominal' instance CELLAR could change places. Then, CELLAR would be the most deeply embedded element and Kiparsky's dictum would be done justice.

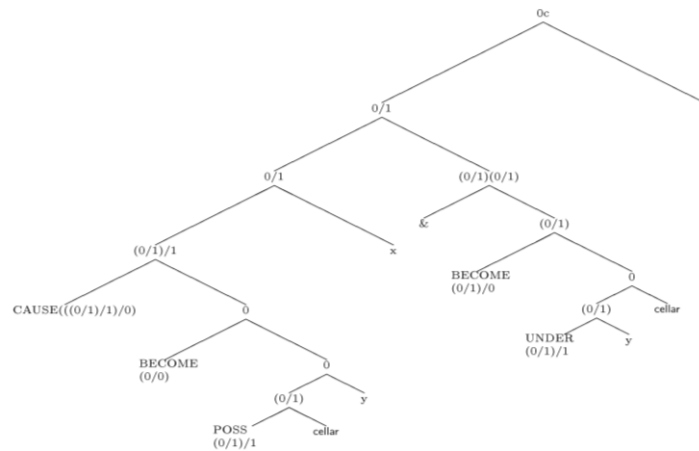
Note, however, that in the root based account where $\lambda\sqrt{\text{unter}}$ functions as the head of a root phrase, which --- different from heads in 'real' prepositional phrases --- lack the functional power of case assignment, the DP *das Haus* marked with accusative could never gain (structural) accusative, because it would be in a position where it cannot be assigned case. In (59) I assume that the relational head $\sqrt{\text{unter}}$ semantically selects the root $\sqrt{\text{cellar}}$ in its argument position and relates its discourse referent η to the discourse referent in the specifier position. In view of the word-syntactic framework $\sqrt{\text{unter}}$ in *unterkellern*, *be(i)* in *belasten*, and all relational prefixes in prefix-verbs of this pattern not only *may* select a figure in its argument position, they *must* do so, unless the reference object (relatum, landmark) is filtered out by the Case Filter.

One can view this as some 'technical' implication of two different approaches. However, Stiebels doesn't claim, that there is anything 'technical', but claims, that something is conceptually wrong with (60). Instead of the paraphrase (a) "put a cellar under a house: cause that a cellar becomes located under the house" the appropriate solution is (b) "provides a house with a cellar: cause that the house gets a cellar, which is located under the house". This conceptualisation paves the way for an SF-representation where the *under*-relation is demoted, whereas another silent POSSession relation is the first and therewith logically promoted relation, see (62). Stiebels presents a compositional step by step derivation which, however, isn't convincing. The main idea is that the prefix-verb is derived as instantiating the left side of (62), following verbs like German *den Platz pflastern* from $\sqrt{\text{pflaster}}$ (pavement) ('to pave the square') (to bring about that the square has a pavement') *die Tapete mustern*[from *Muster*] (to bring about that the wallpaper has a pattern). That there is a productive pattern of this type is beyond doubt. I reject, however, that *das Haus unterkellern* originates in some verb with that semantics. As referred to on page 40 already a verb *kellern* once existed, but it was no locatum verb but a location verb.

(61)

a.	$[]_v$	$\lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{POSS})(y, z)))(s)$
b.	$[\text{keller}]_v$	$\lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{POSS})(y, \text{CELLAR})))(s)$
c.	$(\text{arg}(\text{kellern}))$	$\lambda R. \lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{POSS})(y, \text{CELLAR})))(s) \ \& \ R(s)$
d.	unter	$\lambda v. \lambda u (\text{BECOME}(x, \text{LOC}(u, \text{UNDER } v)))$
e.	$[\text{unter } [\text{keller}]_v]_v$	$\lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{POSS})(y, \text{CELLAR})))(s) \ \& \ \text{BECOME}(\text{LOC}(\text{CELLAR}, \text{UNDER}(y)))(s)$

(62)



The reader might wonder whether Stiebels' analysis could nevertheless be right, and (59) wrong. Isn't *das Haus unterkellern* just like *das Land einzäunen*? The two sound different with stress on the particle in the former and on the syllable following the prefix in the latter. The fact that *unter* is de-focused seems to speak for incorporation of the root, but no independent rule has been stated and tested, yet.

Stiebels presents adjoined phrases that seem to support her analysis: *mit*-phrases, she claims, may indicate a poss-relation. This makes sense in (63.a) and (63.b,c) Or, so it seems. But why is (63. d) so bad?. We have the same prefix-verb where $\sqrt{\text{unter}}$ selects a sortal root denoting a region: $\sqrt{\text{grab}}$ (lit: grave)

- (63) a. das Haus mit einem Kohlenkeller unterkellern (o.k.
according Stiebels:1998) ¹⁷
b. das Fundament mit Felssteinen untermauern; einen Graben mit einer Laufbohle überbrücken;
c. Gelände mit Stacheldraht einzäunen,
d. * das Fundament mit einem Loch / mit einer Höhle untergraben
the fundament with a hole / with a hollow [under][grab]
'to undermine the fundament with a hole or hollow'

My answer is as follows: *mit*-phrases do not indicate POSS, but the ontological sort 'material' of the sortal root. This is why (63.b) where the sortal roots $\sqrt{\text{mauer}}$ (wall), $\sqrt{\text{brücke}}$ (bridge) of the sort material object are incorporated; likewise (63.c) where $\sqrt{\text{zaun}}$ is material. But (63.d) is odd, because $\sqrt{\text{grab}}$ incorporates a root which denotes a spatial region. What about (63.a)? (63.a) is acceptable if one conceptualises a cellar as a thing and not as a region.

So, these data do not speak for (62), but are there any data that speak in favor of (59)? I believe, there are. The phenomenon is well-known. Prefix-verbs like *untergraben*, *untermauern* do *not* license prepositional phrases with *unter* assigning accusative case. Particle-verbs involving the same relational head *do* license such phrases, compare (65.a,b):

- (65) a. * das Haus unter den Boden unterkellern;
* das Fundament unter die Erde untergraben;
* das Fundament unter die Erde untermauern;

¹⁷ (Stiebels 1998:289) contrasts (63.) with (64)

(64) * Sie unterkellerten das Haus unter einen Kohlenkeller

(64) is ungrammatical, but it is so for structural reasons of prefix-verbs in contrast to particle constructions, s.(65.a,b) below. (Stiebels 1998) doesn't make any structural differences between particle verbs and prefix-verbs as far as argument structure is concerned

- b. das Laub unter die Erde untergraben; eine Trennwand unter die Decke untermauern;

There is a structural reason for this: in a prefix-construction like (65.a) all argument slots which are created by the root are satisfied. On the other hand a particle verb like (65.b) (which has a structural description like (57)), and creates a silent argument slot. No argument of $\sqrt{\text{unter}}$ in (59) is open for description. All argument slots are satisfied.¹⁸

As an afterthought I would like to go through the types of particle verbs from the last subsection to check my claim about the sortal dependency of adjoined phrases:

- (67) Wein (o.k) in den eignen Keller / *mit dem eignen Keller einkellern;
die Tasche (o.k.) auf die linke Schulter / * mit der linken Schulter
schultern (Stiebels 1998)
- (68) a. das Gelände mit Stacheldraht einzäunen (= (63.b);
die Figur mit roten Strichen einkästeln
- b. *das Gelände in einen Stacheldrahtzaun einzäunen;
* die Figur in ein Quadrat einkästeln;
- c. die Figur in ein Quadrat einkleben
- (69) a. die Demonstranten * mit einer Polizistenkette einkesseln
b. die Demonstranten * in eine Polizistenkette einkesseln

The judgments in (67) are predicted, because $\sqrt{\text{keller}}$ denotes a region. Those in (68.a)

¹⁸ It is worth mentioning that there are particle verbs which lack corresponding prepositional phrases because the silent slot is satisfied by a discourse referent. One example I have in mind is (66)

(66) an * die Felder / auf (o.k) den Feldern Mais anbauen
on the field_{acc} / on the fields_{dat} corn [an]farm
'to grow corn on the ocal fields'

The argument slot in the argument position of the root $\sqrt{\text{an}}$ is bound by a spatial reference point which is interpreted as the speech-point or an other salient point in context. This reading of *an*-is also found in *sich ansiedeln* (to settle down) and others.

are predicted, because $\sqrt{\text{zaun}}$ and $\sqrt{\text{kasten}}$ denotes material objects. (69.a) is predicted, because $\sqrt{\text{kessel}}$ denote a region, too. Why is (68.b) bad? Doesn't *ein* open a slot for an *in*-PP? The answer is yes, compare (68.c), but the fence isn't existent during the pre-state of the action, so there is no change from outside the fence to outside the fence. However, this is what accusative licensing *in*-phrases express. We have presupposition failure in (68.b). (69.b) fails for the same reason.

I close the subsection and the paper with a short remark on Stiebels analysis of *einrahmen*, which is interesting in context of the discussion above. *Einrahmen*, I claim, can be analysed either following the type *einzäunen* or the type *einkellern*.

- (70) a. das Bild mit einem schönen Rahmen einrahmen;
 * das Bild in einen schönen Rahmen einrahmen
 b. Sie werden von unseren Scouts fotografiert und erhalten einen Abzug
 (eingerahmt in einen) Flyer im Handyformat) zum Mitnehmen.
 [... a Photo, framed in(to) a_{acc}flyer]

(70.a) is predicted if $\sqrt{\text{rahmen}}$ (frame) denotes a material object. (70.b) is o.k. if $\sqrt{\text{rahmen}}$ is understood as some prepared region where the picture is slotted in.

Stiebels' analysis of *einrahmen* is displayed in (71).

(71)

a.	$[\]_v$	$\lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{LOC}(y, R_{\text{prox}}(z))))(s)$
b.	$[\text{rahmen}]_v$	$\lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{LOC}(y, R_{\text{prox}}(z))))(s)$
c.	$[\text{ein}[\text{rahme}]]$	$\lambda z \lambda y \lambda x \lambda s \text{ CAUSE}(x, \text{BECOME}(\text{LOC}(y, R_{\text{prox}}(z))))(s) \ \& \ \text{BECOME}(\text{LOC}(y, \text{INT}(\text{FRAME})(z)))(s)$

Stiebels follows the idea that the noun *Rahmen* (frame) goes into a causal template, (71. a) of location verbs.

Saturating the reference object in a locative sub-template by the noun, yields the verb $[\text{rahmen}]_v$. Again argument extension is applied leading to a representation where the contribution of *ein* becomes redundant in the structure, s. (71. b). The reader might

wonder why Stiebels doesn't treat *einrahmen* like *unterkellern* along the lines 'the picture gets a frame and becomes being in the frame'. The answer is that the theory of SF leaves Stiebels no choice to do so because here FRAME would saturate the most deeply embedded argument in one of the SF-conjunct, but not in the other one. 'The pictures gets a frame and the frame goes around it' wouldn't be a solution either, because this would make the reversal of the relation obvious, which goes beyond what SF allows.

In cases like these we cannot help feeling that when it comes to the syntax of prefix and particle verbs the basic principles of Semantic Form soon become more of a hindrance than a help.

4. Conclusion

Though our comparison isn't really complete and wasn't meant as a competition either I would like to recall that many representation solutions are in the same spirit differing only in more 'technical' respects. This is not so with a notion of compositionality where the DRT-based semantics constructions allows for less strict rules and predicts a wider range of data. This is neither so with de-nominal prefix- and particle verbs, where the word-syntactic and the SF-account result in incompatible views on the principles of the syntax-semantics-interface. The former seems to do more justice to the data.

There is no way to represent the structural differences between non-core as opposed to core-transitive verbs in the SF-framework. As a consequence it disqualifies for representing the formation constraints on *-ung*-nominalisation.

No examples occurred to me that could not be dealt with in a word-syntactic approach for general reasons. However, the important work of spelling out the rules in a more systematic manner remains for future research.

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