LACUS FORUM XXVI

The Lexicon

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QUAECUMQUE VERA

VERB MEANING AS EVENT STRUCTURE

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Semantic theories based on predicate-argument structures have always acknowledged that lexical information associated with verbs is the basic source for the rudimentary semantic structure of sentences. The central role of verbs in sentence structure has become a major insight of modern syntactic theories since the lexical turn in linguistics, too. As a result of this development there has been an increasing interest in theories on the lexical representation of verbs.

This paper will briefly review prevailing theories on verb semantics (section 1), showing that they can capture only a part of the wide range of syntactic and semantic phenomena dependent on verb meaning. For several of these phenomena (section 2) it will turn out that a theory based on highly structured events is more suitable for representing verb meaning. This theory is based on the idea that verbs refer to events that consist of several subevents which are temporally related, classified according to their duration, and whose event participants are connected to some but not necessarily all subevents by semantic relations (section 3)[1].

1. verb meaning theories. The nineties have seen three major approaches to lexical verb semantics: a revival of thematic-role based theories, lexical decompositional approaches and event structure theories[2].

The most successful approach to thematic roles recently has been Dowty's (1991) proto-role theory, which conceives of thematic roles as prototypes. Each role comes with a bundle of lexical entailments associated with it. Roughly, the verb's argument for which the most agent-specific entailments hold qualifies as the proto-agent, while the one with the most patient-specific entailments will become the proto-patient.

Lexical decompositional theories like Levin and Rappaport Hovav (e.g., 1994) or Wunderlich (1992, 1996) assume that the meaning of each verb is captured in a hierarchical representation based on a predicate logic that contains primitive predicates like cause and become.

Finally, event structure approaches to verb meaning are based on Pustejovsky (1991), who assumes that each verb refers to an event that can consist of subevents of different types, where 'states' (S) and 'processes' (P) are simple types which can combine to yield the complex type 'transition': $[P\ S]_T$. In addition to this event structure (ES), Pustejovsky assumes the level lcs', where each subevent is related to a decomposition. Out of this, a third level of Lexical Conceptual Structure (lcs) can be derived, which contains a single lexical decomposition.

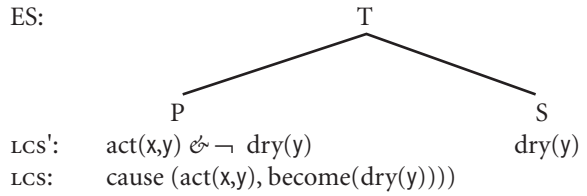
Combinations of any two of these basic approaches also occur. Grimshaw (1990) combines a hierarchical thematic-role based representation with an aspectual representation drawn from Pustejovsky's event structure. In Wunderlichs (1996) Lexical Decompositional Grammar, lexical decompositions are provided with an event argument that is sorted with respect to its event structure properties. Van Valin's (1990) Role and Reference Grammar allows the derivation of thematic roles from certain positions in decompositional structures.

A verb like *to dry off* (as in *Ron dried off the beer mug*) is represented in a thematic role approach as in (1)a and in a decompositional approach as in (1)b (possibly with an additional sorted event argument), while a Pustejovsky-style event structure representation is as in (1)c:

(1) a. *to dry off*: $<\mathbf{x}^{(\text{PROTO-})\text{AGENT}}, \mathbf{y}^{(\text{PROTO-})\text{PATIENT}}>$

b. *to dry off*: $(\mathbf{x}\ \text{CAUSE}\ (\text{BECOME}(\text{DRY}\ \mathbf{y})))\ (\mathbf{e}^{\text{TRANSITION}})$

c. *to dry off*:



Surprisingly, the question of what kind of phenomena besides linking phenomena have to be captured by theories on verb semantics has only rarely been discussed, the mapping from semantic to syntactic structures having been the dominant subject ever since early theories on thematic roles. But the range of phenomena whose explanation depends on appropriate lexical representations of verbs is much broader. There are at least five types of phenomena to be distinguished:

A. SEMANTICS-SYNTAX MAPPING: Semantic properties of verbs determine to a large degree the syntactic realization of arguments and the ability to take part in valence alternations, resultative constructions, etc.

B. GRAMMATICAL-CATEGORIAL RESTRICTIONS: Verbs are semantically classified with respect to their ability to occur in certain grammatical categories like progressive, imperative, or particular voices.

C. INTERLEXEMATIC RELATIONS: Verbs stand in semantic relations to each other, such as antonymy, hyponymy or synonymy.

D. INFERENCE BEHAVIOR: Lexical properties influence the inference behaviour of lexical items in complex expressions. In particular, there are lexically-based inference peculiarities that show up in regular alternations of sentence patterns (diathesis, change in tense or grammatical aspect). These are due to the membership of the participating verb in a particular semantic class.

e. SELECTIONAL RESTRICTIONS: The combination of a verb with other lexemes is subject to certain semantic restrictions. This concerns the co-occurrence of particular adverbials or derivational morphemes with certain classes of verbs and verb-dependent restrictions on the NPs filling argument positions.

Most theories on verb semantics have not been developed to cover all of these phenomena. In particular, thematic role approaches and many decompositional theories are exclusively devoted to linking phenomena, while event structure theories try to capture some of the data concerning selectional restrictions and inference behavior, too. Of those theories solely occupied with linking phenomena, some are not explicit about how to handle phenomena of the types B through E, while others assume different levels of lexical semantic representations, suggesting that linking phenomena are handled on a semantic level (in a narrower sense) while some of the non-linking phenomena might be accounted for on a different, conceptual level. However, I am not aware of a theory on verb semantics that aims at covering data of all five types.

In the following section I will present a sample of data that covers these five kinds of phenomena, most of which have rarely if at all been discussed in lexical semantics. I will show that the representational distinctions made by the abovementioned theories are not sufficient to account for these data.

2. PHENOMENA UNEXPLAINED. A widespread assumption is that events are a basic ontological sort in a semantic theory and are therefore represented by event arguments. Furthermore, the majority of event semanticists assume that event arguments are lexically projected from verbs or verbs of certain classes. Thus, event structure theories and many decompositional and thematic role approaches include event arguments in their lexical semantic representations.[3] The main motivation for event arguments comes from the assumption that many adverbials are predicates over events (Davidson 1967). Thus, those theories which assume that the subevents an event consists of also have to be included in the lexical representation of verbs raise the expectation that subevents are visible for adverbial modification processes. In fact, it has been shown by Pustejovsky (1991) and Wunderlich (1992) that adverbs like *rudely* or *almost* show ambiguities that can be explained by assuming that they are either related to the whole event or to the result state. A closer look at some other adverbial modification phenomena shows that an event structure even more fine-grained than the one suggested by Pustejovsky is desirable for the explanation of the interpretation of adverbials. In (2), each of the adverbial PPs headed by *mit* is clearly related to a different part of the event, as the respective implications show.

(2) a. *Otto fuhr den Wagen mit großem Vergnügen*
'Otto was driving the car with great pleasure'
→ Otto was doing something with great pleasure
↛ the car was moving with great pleasure
b. *Otto fuhr den Wagen mit Höchstgeschwindigkeit*
'Otto was driving the car at highest speed'
↛ Otto was doing something at highest speed
→ the car was moving at highest speed

If we assume that two subevents are involved here, a causing subevent $\mathbf{e^1}$ (Otto operating the car) and a caused subevent $\mathbf{e^2}$ (the car moving), the difference between (2)a and (2)b can be explained[4]. The first adverbial, *mit großem Vergnügen*, modifies $\mathbf{e^1}$, the second one, *mit Höchstgeschwindigkeit*, $\mathbf{e^2}$ (cf. Engelberg 2000 for more examples)[5].

Further support for the assumption of structured events comes from interlexematic relations like hyponymy, antonymy or synonymy which are rarely discussed in verb semantics. Quite possibly, this is due to the fact that they cannot be easily accounted for in decompositional approaches[6], which have dominated verb semantics for quite a while. Expressions like *run somewhere* vs. *jog somewhere* (3) and *alter something* vs. *shorten something* (4) show a hyponymy relation. Every *jogging to somewhere* is a *running to somewhere* (but not the other way around) and every *shortening something* is an *altering something* (but not the other way around).

(4) a. *Rebecca jogged to the lake*
b. *Rebecca ran to the lake*
(5) a. *the tailor altered her pants*
b. *the tailor shortened her pants*

But there is a difference between these two pairs. In (5) the hyponymy relation is related to the result state (the result state of *shortening* is a specific case of the result state of *altering*), whereas in (4) it is related to the agentive subevent (the activity of jogging is a special form of running), and not to the result state of being somewhere. By referring to structured events, we can refine and relativize the idea of hyponymy as follows:

- The verb *to run* (in its directional variant) is a hyponym of *to jog* with respect to the agentive subevent $\mathbf{e^1}$ because all properties of $\mathbf{e^1}$ which can be inferred from *to run* can also be inferred from *to jog* with respect to its agentive subevent $\mathbf{e'^1}$. It follows from *to run* that the agent moves his legs in $\mathbf{e^1}$. The same follows from *to jog* with respect to $\mathbf{e'^1}$, but where *to jog* also implies that $\mathbf{e'^1}$ is a kind of a sports activity and relatively slow.
- The verb *to alter* is a hyponym of to shorten with respect to the result state $\mathbf{s}$ because all the properties of $\mathbf{s}$ which can be inferred from *to alter* can also be

inferred from *to shorten* with respect to its result state **s'**. It follows from *to alter* that the altered object is different than before. The same follows from *to shorten* with respect to **s'**, but in addition *to shorten* also implies that the different property of the object consists in being shorter than before[7].

2.1. FIRST CONCLUSION. Lexical representations should make reference to structured events. These event structures have to be more fine-grained than the one suggested by Pustejovsky (1991), allowing up to two process-like subevents plus a result state.

A second group of phenomena involve non-prefixed transitive verbs in German which show a valence alternation between an accusative NP and a PP headed by an.

(7) a. *Rebecca baute eine Hundehütte / an einer Hundehütte*
lit. Rebecca built a doghouse / at a doghouse
approx. 'Rebecca built / was building a doghouse'
b. *Rebecca streichelte ihre Katze / *an ihrer Katze*
'Rebecca petted / was petting her cat'
c. *Rebecca brach ihren Arm / *an ihrem Arm*
'Rebecca broke / was breaking her arm'
d. *Rebecca kniff ihren Freund / *an ihrem Freund*
'Rebecca pinched / was pinching her boyfriend'

As the examples in (7) show, there is a subset of transitive verbs that allow the *an*-construction, like those in (8)a, while other transitive verbs don't (8)b[8].

(8) a. *an*-construction possible: *waschen* 'to wash', *schreiben* 'to write', *bügeln* 'to iron', *reparieren* 'to fix', *stricken* 'to knit', *manipulieren* 'to manipulate', *kochen* 'to cook', *rechnen* 'to calculate', *nähen* 'to sew'
b. *an*-construction not possible: *kennen* 'to know', *quälen* 'to tease/torture', *photographieren* 'to photograph', *sehen* 'to see', *sprengen* 'to blow up', *stehlen* 'to steal', *lösen* 'to solve'

The crucial restriction for the *an*-construction involves two parameters: it is restricted to verbs that express: a., an event of a certain duration which, b., leads to a result state as in (7)a. Neither non-resultative durative verbs (7)b nor punctual verbs with (7)c or without result state (7)d allow this alternation[9].

The distinction between the reference to durative vs. punctual events is not made in any of the theories discussed in section 2, which is particularly problematic for those theories which claim to be able to represent all the information relevant for linking phenomena. Beyond the valence alternation in (7), there are many other phenomena in the domains of selectional restrictions, grammatical-categorial restrictions and semantic-syntax mapping which require a lexically based distinction between punctuality and durativity (Engelberg 1999a, 1999b).

2.2 SECOND CONCLUSION. Verbs have to be lexically marked as to whether they refer to punctual or to durative events. It has often been observed that with causative-inchoative verb pairs, a sentence containing the causative verb entails the sentence containing the inchoative verb, as in (9). But what has not been noticed is that this entailment relation does not always hold if verbs are put in the progressive form (10)[10].

(9) a. *Rebecca dried her hair* → *her hair dried*
b. *Rebecca felled the tree* → *the tree fell*
(10) a. *Rebecca was drying her hair* → *her hair was drying*
b. *Rebecca was felling the tree* ↛ *the tree was falling*

The different inference behaviour in (10) can be put down to semantic peculiarities of the verb to dry on the one hand and to fell on the other. With *to dry* the temporal relation between the causing event (Rebecca acting upon her hair) and the caused event (her hair drying) can be conceived of as temporally parallel or overlapping. This temporal relation does not hold with *to fell*; the causing event (Rebecca acting upon the tree) necessarily precedes the caused event (the tree falling).

2.3. THIRD CONCLUSION. Another lexical parameter, not accounted for in the theories discussed above, involves the different kinds of temporal relations between subevents. Occasionally, it has been noticed (e.g., Morgan 1969, Pustejovsky 1991) that phrases of the type *for one hour* show a certain ambiguity. In (11)a the *for*-phrase is related to the activity of jogging, in (11)b to the result state of being out of the house:

(11) a. *he jogged for twenty minutes*
*er joggte **zwanzig Minuten lang***
b. *he left the house for twenty minutes*
*er verließ das Haus **für zwanzig Minuten***

As the translations in (11) show, these two readings are expressed by two different phrases in German. The restrictions for the German *für*-PP are particularly interesting. A corpus-based investigation revealed that the *für*-PP referring to a result state is only acceptable if the result state of the event is controlled by the agent as in (12)a and (12)b. If demonstrators block a street (12)a, the result state of the street being blocked will hold as long as the demonstrators maintain this state, while the state that results from loosing a key (12)c is not controlled by the agent. (Within the glosses, *for* is intended to refer to the length of the result state and not the preceding activity.)

(12) a. *sie blockierten die Straße für eine Stunde*
'they blocked the street for one hour'

(12) b. *sie besetzten die Fabrik für drei Tage*
'they occupied the factory for three days'
c. ?? *sie verlor den Schlüssel für einige Minuten*
'she lost the key for five minutes'
d. ?? *sie aß den Apfel für eine Stunde*
'she ate the apple for one hour'

Thus, the contrast in grammaticality between (12)a and (12)b on the one hand and (12)c and (12)d on the other hand, which is due to the involvement or non-involvement of the agent in the result state, supports a suggestion that was made by Grimshaw (1990) in a different context, namely that the event participants are linked to particular subevents for different verbs[11].

2.4 FOURTH CONCLUSION. Lexical entries of verbs have to reflect the fact that the participants of the event the verb refers to are not necessarily involved in all subevents, but only in some of them, and that they are involved in different subevents in a different manner.

Another well-known puzzle of lexical semantics and aspect has been the question why some verbs cannot occur in the progressive aspect:

(13) a. *Rebecca was pinching Jamaal / was hopping* (→ repeatedly)
b. *Rebecca was winning the race / was arriving*
c. ??*Rebecca was noticing that* / ??*that was astonishing Rebecca*

The occurrence of punctual verbs in the progressive, as well as their interpretation, is subject to restrictions, whereas all durative verbs allow the progressive[12]. First, non-resultative punctual verbs are interpreted iteratively when they occur in the progressive (13)a. Secondly, some punctual verbs can occur in the progressive because they presuppose a preceding event, as in (13)b, where it is pre-supposed that Rebecca participated in the race or was nearing the completion of her journey[13]. In this case, the progressive sentence is related to the time of this preceding event. Finally, only punctual verbs that do not belong to these two types—especially those that lead to cognitive states as in (13)c—do not occur in the progressive aspect.

2.5 FIFTH CONLUSION. Meaning representations of verbs not only have to include information about those subevents whose occurrence is implied but also about those whose occurrence is presupposed. This overview of unexplained phenomena, first, has shown that there are many phenomena that are not accounted for in prevailing theories on verb semantics and, second, that these phenomena fall into each of the five classes of phenomena relevant to lexical semantics: linking phenomena as in (7), grammatical categorial restrictions as in (13), selectional restrictions as in (12), interlexematic relations as in (4), and inference restrictions as in (2) and (10). Thus, even if we take into consideration that current theories of verb semantics are

devoted only to the explanation of data of some of these classes, there are always some data falling into the domain of these theories which they cannot explain. In the next section I will develop the outline of a theory of verb semantics that can account for the phenomena presented in this section.

3. AN EXTENDED 'LEXICAL EVENT STRUCTURE' APPROACH. The phenomena discussed in the last section suggest that lexical representations of verbs should be based on the notion of events and their properties, i.e., their mereological structure, the length of subevents and the temporal relations between them as well as the relations between subevents and their participants.

These ideas are captured by the following theory that I will refer to as 'Lexical Event Structure Theory'. Its basic idea is that the meaning of a verb is to be represented as a lexical event structure (LES) which has the following characteristics:

A. COMPLEXITY OF EVENTS: Verbs refer to events that are internally structured in the sense that they can consist of different subevents ($\mathbf{e^1}$, $\mathbf{e^2}$,…) and a possible result state ($\mathbf{s}$).
B. SORTS OF SUBEVENTS: The subevents are durative ($\mathbf{e^{DUR}}$) or punctual ($\mathbf{e^{PCT}}$).
C. RELATIONS BETWEEN SUBEVENTS: A subevent can precede another subevent (<) or subevents can be temporally parallel or to a large degree overlapping (<>).
D. PARTICIPATION IN SUBEVENTS: The event participants which correspond to the verb arguments are not necessarily involved in all subevents, but rather only in some of them; semantic functions like 'control', 'move', 'volition', etc., relate participants and subevents[14.]
E. IMPLICATION VS. PRESUPPOSITION: The occurrence of a subevent is either entailed ($\rightarrow_I$) or presupposed ($\rightarrow_P$) by the open proposition that constitutes the verb's meaning, i.e., by an expression like 'verb($\mathbf{x,y,e}$)'.

Some examples will illustrate how this has to be applied to particular verbs. The two-place verb *abtrocknen* 'to dry off' as it appears in (14) always refers to a complex event where the first subevent $\mathbf{e^1}$ is not punctual but of a certain duration (DUR) and involves two participants, an agent and a patient, e.g. Ron's acting upon the beer mug. Simultaneously ('<>'), a second event $\mathbf{e^2}$ occurs only involving the patient, namely the the beer mug becoming dry. This results in a following ('<') state s of the beer mug being dry.

(14) a. *Ron hat sein Bierglas abgetrocknet*
'Ron dried off his beer mug'
b. *Silvia hat sich die Füße abgetrocknet*
'Silvia dried off her feet'

(14) c. *Klaus hat seinen kleinen Bruder abgetrocknet*
'Klaus dried off his little brother'

This is captured in the LES of abtrocknen 'to dry off' as follows:

(15) a. *abtrocknen*: $\mathbf{x}^{nom}$, $\mathbf{y}^{acc}$
b. LES: $(\rightarrow_I \mathbf{e1}^{[+DUR]}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT}) <> (\rightarrow_I \mathbf{e2}^{[+DUR]}\text{: } \mathbf{y}^{PATIENT})$
$< (\rightarrow_I \mathbf{s}\text{: } \mathbf{y}^{PATIENT})$

Some other representations of verbs mentioned in section 2 illustrate this idea. The causative but non-resultative *fahren* 'to drive, to go by car/train' requires a structure similar to causal resultatives like *to dry off*, *to blacken*, etc. but lacks a result state in its non-directional variant:

(16) a. *fahren*: $\mathbf{x}^{nom}$, $\mathbf{y}^{acc}$
b. LES: $(\rightarrow_I \mathbf{e1}^{[+DUR]}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT}) <> (\rightarrow_I \mathbf{e2}^{[+DUR]}\text{: } \mathbf{y}^{PATIENT})$

In contrast to *abtrocknen*, the agentive-causative *blockieren* 'to block' is characterized by a result state which is controlled by the agent:

(17) a. *blockieren*: $\mathbf{x}^{nom}$, $\mathbf{y}^{acc}$
b. LES: $(\rightarrow_I \mathbf{e1}^{[+DUR]}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT}) <> (\rightarrow_I \mathbf{e2}^{[+DUR]}\text{: } \mathbf{y}^{PATIENT})$
$< (\rightarrow_I \mathbf{s}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT})$

While the causative *fällen* 'to fell' is similar in most respects to verbs like *abtrocknen* 'to dry off', it implies a different temporal relation between the causing and the caused subevent, since in contrast to *abtrocknen* the causing subevent completely precedes the caused one:

(18) a. *fällen*: $\mathbf{x}^{nom}$, $\mathbf{y}^{acc}$
b. LES: $(\rightarrow_I \mathbf{e1}^{[+DUR]}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT}) < (\rightarrow_I \mathbf{e2}^{[+PCT]}\text{: } \mathbf{y}^{PATIENT})$
$< (\rightarrow_I \mathbf{s}\text{: } \mathbf{y}^{PATIENT})$

Finally, the verb *gewinnen* 'to win' (in the sense of 'win a competition') is distinct from the verbs above because the occurrence of the first subevent is not implied but presupposed[15]:

(19) a. *gewinnen*: $\mathbf{x}^{nom}$, $\mathbf{y}^{acc}$
b. LES: $(\rightarrow_P \mathbf{e1}^{[+DUR]}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT}) < (\rightarrow_I \mathbf{e2}^{[+PCT]}\text{: } \mathbf{x}^{AGENT},\mathbf{y}^{PATIENT})$

The event structures above are shorthand notations for representations in a type-driven predicate logic with a lambda-operator as in Engelberg (2000), where more precise definitions of the semantic predicates and relations involved in the

representations are given. The complete representations given there also contain more detailed information about the specific result states, causal relations and the semantic relations between participants and subevents.

To conclude, a satisfactory lexical semantic account of a broad range of data like linking phenomena, grammatical-categorial restrictions, lexical inference behavior, interlexematic relations, and selectional restrictions can be provided by event structure representations. The Lexical Event Structure theory proposed in this paper is based on the assumption that verbs refer to events consisting of subevents which are characterized for duration and stand in temporal relations to each other and to which the event's participants have specific semantic relations. It has been demonstrated how the restrictions for a number of phenomena from the domain of German and English verbs can be captured within this theory.

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[2] Besides these theories, much work has been done on aspectual properties of verbs and their projections which, despite its amount, has not led to very sophisticated lexical representations of verbs.

[3] Thematic-role based approaches with event arguments usually employ neo-davidsonian representations, in particular in theories on aspectual compositions, e.g., for *to eat*: EAT(**e**) & AGENT(**x**,**e**) & PATIENT(**y**,**e**).

[4] Besides these two subevents an additional result state has to be assumed if a directional PP occurs as in *er fuhr den Wagen gegen einen Baum* 'he drove the car into a tree'.

[5] The verb *fahren* 'to drive, to go by car/train' in fact shows a causative alternation in German: i) *der Wagen fuhr* 'the car moved'; ii) *er fuhr den Wagen* 'he drove the car'.

[6] This has already been shown by Fodor (1977).

[7] A slightly different case constitutes the relation between *to dye* and *to blacken* which, at first glance, seem to stand in a hyponymy relation with respect to the result state as well:

(i) *Jamaal blackened his shoes*
(ii) *Jamaal dyed his shoes*

It follows from *to dye* that the dyed object has a different color than before. The same follows from *to blacken* with respect to its result state, but with the difference that *to blacken* also implies that the new color of the object is black. But there is a problem, as conference participants pointed out: The verb *to blacken* refers to a more superficial application of paint etc., whereas *to dye* involves a coloring of the substance beneath its surface, too. Thus, a sentence like (iii) does not imply (iv):

(iii) *Jamaal blackened his face*
(iv) ?*Jamaal dyed his face*

Yet, the relativized hyponymy relation still holds with respect to a certain description of the result state. If the result state of *to dye* is understood in the sense that every part of the object to which the paint / dye has been applied has a different color afterwards and the result state of *to blacken* is characterized by the fact that every part of the object to which the paint / dye has been applied is black afterwards, we still get a

hyponymy relation with respect to the result state. A relativized hyponymy relation which only holds under a certain description of the result state constitutes a case of 'weak hyponymy'. This notion still captures the obviously different degrees of specificity present in pairs like *to dye* and *to blacken*.

[8] For independent reasons the *an*-construction never occurs with derived verbs, cf. Engelberg (1994).

[9] In Engelberg (1999a) it is shown how the notion of 'punctuality' in the sense of 'of very short duration' can be linked to cognitive time concepts.

[10] This phenomenon is not to be confused with the imperfective paradox, according to which the inference from a sentence in the progressive to a sentence in simple tense is not valid for accomplishment-type verbs.

[11] More data that give rise to this assumption are discussed in Engelberg (2000), involving causativization phenomena as well as the realization of the agent in certain passive constructions.

[12] There are restrictions on stative verbs in progressive form, too, but these will not be discussed here.

[13] That this is a presupposition rather than an implication is evident because it even follows from the negated sentence Rebecca did not win the race that Rebecca participated in the race.

[14] For simplicity, I will not list the particular semantic relations in the following representations (cf. Engelberg 2000) but just speak of agents and patients in a very unspecific way.

[15] The second argument can be classified as a patient in a framework like Dowty's (1991) prototype theory, but as I mentioned before, the thematic relations in these abbreviated representations are just a shorthand notation for more specific relations anyway.

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