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Verb Meaning: How much Semantics is in the Lexicon?

1 Introduction

Obviously, verbs contribute fundamentally to the meaning of utterances which they are part of. But there is a continuous discussion about the concrete nature of their contribution. Particularly, the fact that many verbs exhibit more than one literal, i.e. conventionalized meaning gives rise to a number of questions concerning their semantics. Thus, in view of the variability of use it is reasonable to ask how much of the conceptual information – conveyed by utterances – is actually supplied by the lexical meaning of the verb. More specifically, one could ask to what extent the interpretation of verbs is triggered by semantic information from the lexicon. Or, to say it in another way, what do we know about the meaning of a verb when we know its lexical semantics?

Three strategies of analyzing the problem can be roughly distinguished: the *maximalist*, the *intermediate* and, the *minimalist strategy*. Maximalist approaches try to derive as much information as possible from the lexicon and, therefore, assume rather rich semantic characterizations of verbs. In particular, they suppose that each meaning variant of a verb should be represented with a separate lexical semantic entry. By way of contrast, minimalist approaches give prominence to the assumption that verbal semantics is at most confined to a few abstract fixings in the lexicon. As a consequence of attributing more importance to contextual modulation in the interpretation, they negate the existence of lexical polysemy. Finally, intermediate approaches also aim at reducing the number of lexical semantic representations for one and the same verb. However, as intermediate approaches are projectionist in nature this reduction only works at the cost of expanding the part of general semantic assumptions in the lexicon.

In this paper, we review those strategies and argue for an analysis that adopts a minimalist attitude towards the lexical semantics of verbs. Our considerations are founded on the assumption that the relation between the grammatically determined meaning of a linguistic expression and its interpretation in a particular context is a complex and many-lay-

ered one. Particularly, we suppose that the content of an utterance is not conveyed directly by this utterance. Instead, it is encoded in a rather fragmentary, schematic structure called *semantic form* and can only be accessed via inferences that provide the necessary enrichment of the conceptually underspecified semantic representation on the basis of world knowledge. Thus, the understanding of utterances always involves a pragmatic process of inferential completion of the linguistically given information. We want to investigate this general phenomenon with respect to the lexical semantic form of verbs and their contextual specification in utterance interpretation.

The paper is organized as follows. Chapter 2 gives a survey of relevant data of meaning variation of verbs. We show that there have to be distinguished two main types of variation of primary meaning within the verbal domain.

Chapter 3 discusses the maximalist attitude towards the lexicon and examines in more detail a particular proposal that is prototypical for the strategy of lexical meaning specification and, hence, of lexical polysemy. Chapter 4 serves the comparison of some intermediate analyses. Thereby we turn our attention to the framework of lexical decomposition, because it is the most important and most influential device of this strategy of the semantics of verbs. The discussion of the three strategies is concluded in chapter 5 by examining several minimalist approaches. Particularly, we evaluate a more recent, syntactic line of meaning decomposition that ultimately results in a disposal of the lexical verb semantics as such.

Chapter 6 offers our proposal of a radically underspecified semantic representation of verbs, which is viewed as the indispensable lexical base for contextually varying the verbal meaning. In chapter 7 we sketch how the differentiation between several meaning variants can be accomplished by pragmatic enrichment of semantic forms.

2 Meaning Variation of Verbs

One of the most controversial topics of the research on verb meaning is the phenomenon traditionally called *polysemy* (cf. e.g. Cruse 1986, Pinkal 1995, Ravin & Leacock 2000 and Pethö 2001). The main characteristic of a verb being subject to a variability of this kind is that it has a set of different meanings which are related to each other in non-trivial ways and are equally conventionalized. Such *variations of pri-*

mary (or *literal*) *verb meaning*¹ differ essentially from the ones that involve a transfer to a secondary (or non-literal) meaning i.e. *shifts of verb meaning*.² Moreover, there have to be distinguished two main types of variations of primary verb meaning – the systematic (or regular) and the non-systematic (or non-regular) one. Instances of both types come along with alternations in the argument structure of the verbs, i.e. in number or order of their argument positions or in sortal restrictions on their arguments.

Systematic variations of primary verb meaning are characterized by general relations between the several readings and, therefore, a more or less large number of verbs exhibit this type of variation in similar fashion. They are of major concern for the semantic and syntactic research for quite some time (cf. e.g. Grimshaw 1990, Jackendoff 1990, Levin 1993, Goldberg 1995 and Levin & Rappaport Hovav 1995). A typical kind of systematic meaning variation of verbs is the alternation between a causative and an inchoative reading exemplified by sentences as in (1a) and (1b), respectively.

- (1) a. Anna schmolz das Eis.
Anna melted the ice.
b. Das Eis schmolz.
The ice melted.
c. *Anna schmolz [irgendetwas].
*Anna melted [something].

Whereas (1b) describes a change of state of the ice (1a) describes Anna's bringing about of such a change. It appears that the causative reading of the verb *schmelzen* 'melt' is connected to its transitive use and the inchoative reading is connected to its intransitive one. In the

¹ Generally, we will use the more neutral term *variation of primary meaning* instead of *polysemy* for reasons that will become clear later in the text.

² Examples of meaning shift are given by sentences like (i) and (ii).

- (i) #Die Flasche gefror.
#The bottle froze.
(ii) #Das Kind nieste zehn Minuten lang.
#The child sneezed for ten minutes.

Whereas the arguments of the verb *gefrieren* 'freeze' in its primary meaning are restricted to NPs of liquids in (i) it has a reading in which its argument refers to a container of liquid. Analogously, whereas originally *niesen* 'sneeze' applies only to occurrences of a single sneezing in (ii) the verb refers to a process of repeated sneezing. As is indicated by #, both verbs are subject to a particular coercion by means of which they are getting a derived, secondary reading. In this paper we will not deal with such variations of verb meaning. For a general approach see e.g. Dölling (2003, 2005) and Egg (2005).

causative the nominative NP refers to the agent of the eventuality³ described and the accusative NP to the theme, but in the inchoative the nominative NP refers to the theme of the eventuality. The most essential observation is that a sentence like (1a) entails one like (1b). In this manner, the entailment relation makes it clear that the two meaning variants of the respective verb are systematically related to one another. Moreover, the case of (1c) indicates that a verb like *schmelzen* has no intransitive use in which the theme is left implicit. Other verbs of this type are e.g. *verbrennen* 'burn' and *zerbrechen* 'break'.

A second kind of systematic meaning variation connected to the transitive/intransitive alternation of a verb is instantiated by *fegen* 'sweep' in (2) (and, analogously, e.g. by *wischen* 'wipe', *essen* 'eat' or *schreiben* 'write').

- (2) a. Hans fegte den Flur.
Hans swept the floor.
b. *Der Flur fegte.
*The floor swept.
c. Hans fegte [irgendetwas].
Hans swept [something].

Here the difference between the two meaning variants of the verb follows from the fact that in (2a) the theme of sweeping is referred to, but in (2c) it is not. As the last sentence is entailed by the first one both uses of *fegen* stand in a general meaning relation to each other. Furthermore, (2b) shows that unlike to (1b) no reading of the verb exists where the subject NP refers to the theme.

Moreover, we have to distinguish between systematic meaning variations of verbs like *fegen* and *wischen* on the one hand and such of verbs like *essen* and *schreiben* on the other hand. In (3a) the verb *fegen* is applicable either to processes or to events and, thus, has two possible readings, in (3b) it can only apply to processes. By way of contrast, in (4a) the verb *essen* may be predicated of events only whereas in (4b) it shows an behaviour analogously to *fegen* in (3b). Essentially, in each case the (b)-sentence follows from the respective (a)-sentence.

- (3) a. Maria fegte zwei Flure in zehn Minuten/zehn Minuten lang.
Maria swept two floors in ten minutes/for ten minutes.
b. Maria fegte Flure *in zehn Minuten/zehn Minuten lang.
Maria swept two *floors in ten minutes/for ten minutes.

³ The term *eventuality* is used in a general sense (cf. Bach, 1986) comprising events, changes, actions, processes, activities, states etc.

- (4) a. Maria aß zwei Äpfel in zehn Minuten/*zehn Minuten lang.
 Maria ate two apples in ten minutes/*for ten minutes.
 b. Maria aß Äpfel *in zehn Minuten/zehn Minuten lang.
 Maria ate apples *in ten minutes/for ten minutes.

The data in (4) indicate that the meaning of *essen* alternates depending on whether the accusative NP has a quantized reference – (4a) – or a cumulative reference – (4b). Such a meaning alternation is based on the fact that the objects referred to by accusative NPs in sentences like (4) figure as an incremental theme in the eventualities described.⁴

Another kind of systematic variation is demonstrated by (5).

- (5) a. Luisa kochte die Suppe.
 Luisa cooked the soup.
 b. Die Suppe kochte.
 The soup cooked.
 c. Luisa kochte [irgendetwas].
 Luisa cooked [something].

The sentences in (5b) and (5c) suggest that a verb like *kochen* 'cook' (as well as e.g. *rauchen* 'smoke' and *backen* 'bake') allows for two intransitive uses. It appears that the relation between (5a) and (5c) is the same as that between (2a) and (2c). More importantly, in (5a) – as well as in (5c) – the verb has an agentive (or causative) reading, whereas in (5b) it has a non-agentive one. Similarly to the relation between (1a) and (1b), the sentence in (5a) entails that in (5b).

As illustration of a last kind of systematic meaning variation, which can be connected to alternation between the transitive and intransitive use of the respective verb, consider the sentences in (6).

- (6) a. Fritz trank den Alkohol.
 Fritz drank the alcohol.
 b. Fritz trank [, d.h. er war Alkoholiker].
 Fritz drank [, i.e. he was an alcoholic].

Unlike the verbs in (2c) and (5c) *trinken* 'drink' in sentence (6b) does not exhibit an episodic but a habitual reading. This means that there are at least two different meaning variants of the verb, which are related: in (6a) *trinken* denotes a property of events, in (6b) it denotes a property

⁴ See Krifka (1989, 1992) for a seminal explanation of this kind of systematic meaning variation. Cf. also e.g. Filip (1999) and Rothstein (2004).

of states that are realised by such events (cf. Parsons 1990). An analogous variation can be observed, e.g., with the verb *rauchen* 'smoke'.

Contrary to the meaning variations discussed so far *non-systematic variations* of primary verb meaning are in each case specific for a particular verb and, therefore, idiosyncratic in a way. So, the sentences in (7) illustrate various readings that the verb *öffnen* 'open' can have.⁵

- (7) a. Der Pförtner öffnete die Tür.⁶
The porter opened the door.
b. Die Mutter öffnete das Paket.
The mother opened the parcel.
c. Der Angestellte öffnete die Datei.
The clerk opened the file.
d. Die Dame öffnete die Halskette.
The lady opened the necklace.
e. Der Junge öffnete das Taschenmesser.
The boy opened the pocket knife.
f. Der Verkäufer öffnete das Geschäft.
The shop assistant opened the shop.

All the situations described above have in common that the object referred to by the accusative NP is open in a special way after the respective event of opening is accomplished. At the same time there are important differences between the various actions depending on the sort and the properties of the respective object. The several readings of *öffnen* can be clearly separated from each other so that it would be not appropriate just to assume that the lexical meaning of *öffnen* is simply vague. Instead there are different meaning variants which cover a rather large range of more or less similar domains of eventualities. Therefore, the respective meaning variants are connected to each other by relations of similarity.

Meaning variations based on similarity between the domains covered can be found with many verbs. The examples in (8) and (9) show that the several meaning variants of a verb do not only depend on the

⁵ Cf. Searle (1983) for an analogous discussion of the English verb *open*.

⁶ Notice that the verb can also be used intransitively, but only if it has a meaning that is systematically related to such one given in (7a):

- (i) Der Pförtner öffnete [die Tür].
The porter opened [the door].
(ii) *Der Pförtner öffnete [das Paket/die Datei/...].
*The porter opened [the parcel/the file/...].

different accusative NPs but also on the kind of the nominative NPs (in the case of *nehmen* 'take')⁷ or the PPs (in the case of *verlieren* 'lose').⁸

- (8) a. Der Verkäufer nahm das Geld.
The shop assistant took the money.
b. Der Dieb nahm die Juwelen.
The thief took the jewels.
c. Die Frau nahm den Mann.
The woman took the man.
- (9) a. Hans verlor sein Geld beim Wandern.
Hans lost his money at hiking.
b. Hans verlor sein Geld an der Börse.
Hans lost his money at the stock exchange.

Besides the general world knowledge associated with the constituents of a sentence we often need to know the special context of an utterance to get the right meaning of a particular occurrence of a verb.

- (10) Hans verlor sein Geld.
Hans lost his money.
- (11) Maria verließ die Schule.
Maria left (the) school.

In the case of (10) the context has to determine whether *Geld* 'money' is used in a more concrete sense like in (9a) or in a more abstract sense like in (9b). Similarly, the circumstances of uttering a sentence like (11) have to clarify whether Maria has left the building or the institution. Accordingly, the verb *verlassen* 'leave' denotes a property of local or of social changes.

To conclude, we point out that like systematic meaning variations non-systematic ones can be correlated with alternations in syntactic structure as the following sentences show.

- (12) a. Maria schlug dem Jungen auf die Schulter.
Maria hit the boy on the shoulder.
b. Maria schlug ihren Vater im Schach.
Maria beat her father in chess.

⁷ Obviously, this is true of *öffnen* in a similar way. Cf. e.g. sentences (i) and (ii) where the nominative NP does not refer to an agent.

- (i) Der Schlüssel öffnete die Tür.
The key opened the door.
(ii) Der Wind öffnete die Tür.
The wind opened the door.

⁸ Cf. e.g. Bierwisch (1983, 1996) and Ruhl (1989) for a discussion of similar examples.

- c. Maria schlug ein Loch in die Wand.
Maria hit a hole into the wall.
- d. Maria schlug einen Bogen um das Hindernis.
Maria compassed the fence.

The different meaning variants of the verb *schlagen* 'hit' ('beat', 'compass') are associated with specific distributions of thematic roles and respectively with particular syntactic realisations.

After having outlined the two main types of variation of primary verb meaning, we will examine how proposals of the three different strategies of lexical semantics of verbs – maximalist, intermediate and minimalist – account for them.

3 Maximalist Analyses

The basic assumption of maximalist analyses is that variations of primary verb meaning are instances of lexical polysemy, i.e. a phenomenon of lexical semantics. Consequently, the characterization of a single verb in the lexicon is very rich in order to cover all its different readings. In particular, the several meaning variants are listed as separate semantic representations. On the one hand, this strategy of *lexical specification* of verb meaning seems to reflect most adequately our common experience and is viewed as being in accordance with the lexicographical practice. On the other hand, however, maximalist approaches have to face the objection that they lack generalizations and, therefore, systematicity and cognitive economy.⁹

A prime example for an analysis of this kind is Engelberg (2000). The author assumes that the lexical entry of a verb consists of at least two specifications for each of its variants: *SYN* contains the syntactic subcategorization and hence also the complement structure of the verb variant. *SEM* contains its semantic representation in form of a λ -abstract as well as a set of associated meaning postulates. These meaning postulates determine the semantic entailments between the different meaning variants of the respective verb and furthermore provide the sortal restrictions of the verbal arguments. How many variants of a verb have to be assumed depends on the number of the different syntactic constructions the verb can be part of as well as on the number of the various sortal restrictions on the explicit and implicit arguments of the verb. For instance, Engelberg differentiates between five variants of the verb

⁹ Cf. e.g. Pustejovsky (1995) for a critical examination.

spülen 'wash' (or 'rinse'), which are realised with the help of *spülen*₁ – *spülen*₅ in (13).

- (13) a. Karl spülte₁ die Wäsche/den Mund/das Geschirr/die Haare/die Wunde/...
Karl washed the clothes/the mouth/the dishes/the hair/the wound/...
b. Karl spülte₂ seiner Mutter die Wäsche/den Mund/das Geschirr/...
Karl washed the clothes/the mouth/the dishes/...for his mother.
c. [Mit Hinweis auf Geschirr:] Karl spülte₃ gerade.
[In connection to dishes:] Karl just washed.
d. [Beim Zahnarzt:] Karl spülte₄ gerade.
[At the dentist:] Karl just rinsed.
e. Die Waschmaschine spülte₅ gerade.
The washing machine just washed.

As the sentences suggest, the determination of the lexical entry for *spülen* has to take into account three different subcategorization frames (*spülen*₁ vs. *spülen*₂ vs. *spülen*₃ – *spülen*₅) and, additionally, in view of (13c–d) three different sortal restrictions on implicit arguments of the verb (*spülen*₃ vs. *spülen*₄ vs. *spülen*₅).

In (14) we give a slightly modified version of Engelberg's (2000: 154) entry, where *x*, *y*, *z* are variables for objects, *e* is a variable for eventualities, *WASH*₁ – *WASH*₅ are predicate constants representing the meaning of *spülen*₁ – *spülen*₅, respectively, and \square is the operator of conceptual necessity.

- (14) *spülen*₁: SYN: V, /NP_{acc}/NP_{nom}
SEM: $\lambda y \lambda x \lambda e$. *WASH*₁(*x*, *y*, *e*)
MP_{*spülen*1}: $\square \forall xye [WASH_1(x, y, e) \rightarrow CLOTHES(y) \vee MOUTH(y) \vee \dots]$
- spülen*₂: SYN: V, /NP_{acc}/NP_{dat}/NP_{nom}
SEM: $\lambda y \lambda z \lambda x \lambda e$. *WASH*₂(*x*, *y*, *z*, *e*)
MP_{*spülen*2}: $\square \forall xyze [WASH_2(x, y, z, e) \rightarrow ANIMATE(x) \& ANIMATE(z)]$
MP_{*spülen*3}: $\square \forall xyze [WASH_2(x, y, z, e) \rightarrow WASH_1(x, y, e)]$
- spülen*₃: SYN: V, /NP_{nom}
SEM: $\lambda x \lambda e$. *WASH*₃(*x*, *y*, *e*)
MP_{*spülen*4}: $\square \forall xye [WASH_3(x, y, e) \rightarrow DISHES(y)]$
MP_{*spülen*5}: $\square \forall xye [WASH_3(x, y, e) \rightarrow WASH_1(x, y, e)]$
- spülen*₄: SYN: V, /NP_{nom}
SEM: $\lambda x \lambda v$. *WASH*₄(*x*, *y*, *e*)
MP_{*spülen*6}: $\square \forall xye [WASH_4(x, y, e) \rightarrow HUMAN(x)]$
MP_{*spülen*7}: $\square \forall xye [WASH_4(x, y, e) \rightarrow MOUTH(y)]$
MP_{*spülen*8}: $\square \forall xye [WASH_4(x, y, e) \rightarrow WASH_1(x, y, e)]$

spülen₅: SYN: V, /NP_{nom}
 SEM: $\lambda x \lambda e. \text{WASH}_5(x, y, e)$
 MP_{spülen9}: $\square \forall xye [\text{WASH}_5(x, y, e) \rightarrow \text{WASH_MACHINE}(x)]$
 MP_{spülen10}: $\square \forall xye [\text{WASH}_5(x, y, e) \rightarrow \text{CLOTHES}(y)]$
 MP_{spülen11}: $\square \forall xye [\text{WASH}_5(x, y, e) \rightarrow \text{WASH}_1(x, y, e)]$

Engelberg uses the Davidsonian format for the semantic representation of verbs.¹⁰ Thus, the predicate constants $\text{WASH}_1 - \text{WASH}_5$ denote different relations between eventualities of washing and the objects participating in them. More specifically, there are four three-place predicate constants $\text{WASH}_1, \text{WASH}_3 - \text{WASH}_5$ and one four-place predicate constant WASH_2 . As it is indicated by the semantic representations of *spülen*₃ – *spülen*₅, each of the verb variants has an implicit argument position, i.e. the arity of the λ -abstract does not correspond to that of the predicate constant being part of it. Further properties of the predicate constants are determined by the meaning postulates. Especially, postulates $\text{MP}_{\text{spülen}3}$, $\text{MP}_{\text{spülen}5}$, $\text{MP}_{\text{spülen}8}$ and $\text{MP}_{\text{spülen}11}$ define the relations between the various predicate constants by determining that each of $\text{WASH}_2 - \text{WASH}_5$ entails WASH_1 . It is the existence of these relations, which ensures that the meaning variations are connected to each other. The remaining postulates characterize the sortal restrictions that have to be met by the explicit and implicit thematic arguments.

It is essential that Engelberg's analysis consists in a detailed and precise formal characterization of the lexical semantics of a great number of verbs. Nevertheless, there have to be made at least two major critical points with respect to it.

The first problem is that a lexical entry like (14) does not represent all the possible meaning variants of *spülen*. On the one hand, both *spülen*₁ and *spülen*₂ can be further differentiated in their meaning. It is evident that the verb has different readings – similar to the meaning variants of *öffnen* in (7) – if it is combined with alternating accusative NPs like in (13a) or (13b). On the other hand, for instance, the reading of *spülen* in a sentence like (15) – the German counterpart of *flush* – is not covered by the entry in (14). This reading is highly context dependent and can be not expressed by *spülen*₃ or *spülen*₄ as (13c) and (13d) show.

- (15) [Mit Hinweis auf die Toilette:] Karl spülte gerade.
 [In connection to toilet:] Karl just flushed.

¹⁰ The Davidsonian representational format differs from the traditional one in that the verbs dispose of an eventuality argument in addition to their thematic arguments.

Furthermore, because the respective predicate constant would have only one thematic argument position it cannot be related to the other ones.

The second and more serious problem concerns the sortal restrictions as part of a verb's entry. It is a consequence of the proposal that, for instance, the decision between the different variants of *spülen* can only be drawn on the basis of world knowledge. As an example, in sentences like (16a) and (16b) the sortal restrictions of the verb can only be met if additional information about the NPs *er* 'he'/*sie* 'she'/*es* 'it' and *Nummer 5* 'number 5', respectively, is available.

- (16) a. Karl spülte ihn/sie/es gerade.
Karl just washed him/her/it.
b. Nummer 5 spülte gerade.
Number 5 just washed.

Similarly, this is true of the differentiation between the readings of *spülen* like in (13c), (13d) and (15), where information about the specific situation of utterance is necessary to select the adequate variant.

There are two possible solutions to the latter problem: either one has access to non-linguistic context knowledge during the process of the semantic combination in order to choose the appropriate variant of the verb or one has to compute all the possible variants in parallel and decides at the end of the computation which variant is the adequate one in the given context. The first solution contradicts the principle of semantic compositionality and is not valid in the Montagovian tradition. The second solution implies a rather extensive (and costly) computation, which is undesirable for economical reasons.

Other maximalist approaches can be found within the field of *Cognitive Grammar*. For instance, Langacker (1987, 1988) and Taylor (1995, 2000) argue for a lexical network model to represent the meaning variants of verbs. This means that every polysemous verb is represented in the lexicon by the entirety of its readings which are linked with each other in manifold ways. Admittedly, researchers adopting this position have particularly delivered extensive data on non-systematic meaning variation of many verbs. Contrary to Engelberg's approach, however, the network theory negates the fundamental difference between grammatical and encyclopedic knowledge. Rather, the assumption is that lexical meanings of verbs always constitute themselves on the basis of the whole general knowledge about the respective eventualities. But such a holistic approach to linguistic meaning restricts the validity of the principle of semantic compositionality fundamentally. Thus, it seems to be impossible to explicate the contribution that a par-

particular verb makes to the grammatically determined meaning of expressions.

4 Intermediate Analyses

Proposals that can be characterized as intermediate make up by far the largest group of approaches to verb semantics. Whereas they are lexicalistic by nature – like maximalist analyses – as verbs are assumed to have lexical semantic representations from which syntactic structures are projected¹¹, they also exhibit similarities with the minimalist strategy in that generalizations on meaning variants help to reduce the number of lexical semantic representations of a verb.

Roughly speaking, there are two types of intermediate analysis: The first type supposes that lexical representations of verbs are underspecified and, with it, somehow abstract. The particular meaning variant of a verb results then from specification in the respective context. In contrast to it, approaches of the second type assume one meaning variant of a verb as the basic one. This concrete meaning has to be lexically represented and all other readings are contextually derived from it.

The most important strategy in the realm of intermediate analyses is that of *lexical decomposition*, which can be traced back to the Generative Semantics tradition and has been developed within a more formal framework by Dowty (1979). Its fundamental assumption is that in the lexicon verb meanings can be represented in terms of a relatively small set of general primitives, typically drawn from ontological categories. The major advantage of the strategy is seen in that the lexical semantic representation of a verb contains some information about the structure of the eventualities referred to immediately. So this information is accessible without possibly long-winded inferential processes and, more importantly, can determine the syntactic behaviour of the verb.

The *Conceptual Semantics* of Jackendoff (1983, 1990, 2002) is not only an example of the first type of intermediate approaches but also a prototypical instance of the decompositional strategy. Jackendoff regards the *conceptual structure CS* of a verb as a configuration that is constituted of conceptual primitives and represents the lexical meaning

¹¹ For different lexicalist approaches that view stored semantic information about verbs as central for the syntactic derivation see e.g. Jackendoff (1983), Grimshaw (1990), Williams (1994), Levin & Rappaport Hovav (1995), Heim & Kratzer (1998) and Reinhart (2003).

of the verb. The verbal argument structure as well as the sortal requirements on the arguments are defined with respect to these primitives.

We illustrate the approach by means of the verb *climb*, which appears in sentences like (17a) – (17c) in three syntactic contexts: with a null complement, with a NP, and with a PP.

- (17) a. John climbed.
 b. John climbed the mountain.
 c. John climbed to the top of a mountain.

Jackendoff (1990) unifies the different uses into the lexical entry in (18), where the meaning of the verb is assumed as being decomposed into the conceptual primitives GO, TO and TOP-OF.

- (18) PF: /climb/
 SYN: V, <XP_j>
 CS: [_{Event} GO ([_{Thing}]_i), [_{Path} {TO ([_{Place} TOP-OF ([_{Thing}]_j))}]_{ij})]

In SYN the angled brackets indicate that the postverbal complement is optional; in CS the two possible specifications of the path-constituent as [_{Path} TO ([_{Place} TOP-OF ([_{Thing}]_j)))] or as [_{Path}]_j – depending on whether the postverbal complement is a NP or a PP – are marked as mutually exclusive by using braces. In the syntactic derivation the single meaning variants of *climb* emerge from CS by either specifying the path-constituent in the case of (17b) and (17c) or leaving the path-constituent undetermined in the case of (17a).

A deficit of the proposal is that a lexical entry like (18) does not cover non-systematic variations of primary meaning of the verb like those in (19), i.e. variants of the kind of e.g. *öffnen* in (7) or *nehmen* in (8).

- (19) a. Bill climbed [up] the mountain.
 b. Bill climbed down the mountain/the rope/along the ridge/
 through the tunnel/....
 c. The snake climbed [up] the tree.

Jackendoff (1990, 2002) suggests for these cases to identify the lexical meaning of verbs with a system of preference rules being part of the encyclopedic knowledge. These yield depending on the particular use the adequate reading. Unfortunately, it is completely left open how these two perspectives on verbal meaning can be unified. Another deficit of Jackendoff's approach is that he acknowledges the necessity of

generalized and, therefore, underspecified lexical CSs but does not draw any further consequences from that for his theoretical frame.

By contrast, the *Two-Level Model of Meaning* – established by Bierwisch (e.g. 1983, 1996, 1997, 2002), Bierwisch & Lang (1989) and related work (cf. e.g. Lang 1994, Kaufmann 1995, Ehrich 1996, Stiebels 1996, Steube 1997, Wunderlich 1997, 2000 and Zimmermann 1999) – is based on the assumption of a separate level of *semantic form SF* alongside that of the level of conceptual structure CS. Whereas in terms of CS the context dependent, conceptual interpretation of expressions is organized, SF has the task of representing the purely grammatically calculated meaning. Consequently, representations of this level are determined compositionally by syntactic and lexical semantic information and have to be conceptually underspecified with respect to the concrete content of utterances. Thus, SF plays the role of an interface between syntax proper and what Chomsky (2004) calls the *Conceptual-Intentional System*.

As is suggested, the lexically stored semantic information reflects only those parts of verbal meaning that are grammatically relevant. This means that the lexical SF of a verb has to be understood as a schema imposing grammatical restrictions on meaning variation of the particular verb and, thus, giving rise to restrictions on syntactic structure projected. Concerning the concrete representational format of SF, the Two-Level Model relies on a framework of lexical decomposition, which is essentially an eventuality-based adaptation of the classical proposal of Dowty (1979).

According to Bierwisch (1997, 2002), the lexical entry for *öffnen* can be given as in (20).

- (20) PF: /œffn-/
 SYN: V
 SF: $\lambda y\lambda x\lambda e. e : (\text{ACT}(x) (\text{CAUSE} (\text{BECOME} (\text{OPEN}(y))))))$

The SF in (20) is a decompositional structure that includes the one-place predicate ACT(ivity), the propositional operators CAUSE and BECOME as well as the one-place predicate OPEN as its primitive components. The colon ':' is assumed as a two-place predicate expressing that an eventuality is an instance of the proposition represented by the structure following after the colon.

A lexical entry as in (21) is supposed to yield the basis for handling systematic meaning variations like such ones exemplified by *schmelzen* in (1).

- (21) PF: /[mɛlts-/
 SYN: V
 SF: $\lambda y[\alpha \lambda x] \lambda e. e : [\alpha(\text{ACT}(x) (\text{CAUSE}) (\text{BECOME} (\text{LIQUID}(y))))]_{[\alpha]}$

Here the index α ranges over + and –; the notation $[\alpha X]$ indicates that X is present if α is +, and absent otherwise. Accordingly, the causative and the inchoative reading of *schmelzen* can be derived depending on whether an argument for the position labeled by λx is syntactically available or not. The two readings are represented by the structures in (22a) and (22b), respectively.

- (22) a. $\lambda y \lambda x \lambda e. e : (\text{ACT}(x) (\text{CAUSE} (\text{BECOME} (\text{LIQUID} (y))))$
 b. $\lambda y \lambda e. e : (\text{BECOME} (\text{LIQUID} (y)))$

Moreover, a solution for cases of non-systematic variation of primary meaning has been offered by the approach too. Bierwisch (1996) argues that the decompositional strategy allows a unified SF for verbs like *verlieren* or *verlassen*. The verb *verlieren*, for instance, could have the following lexical entry:

- (23) PF: /verli:r-/
 SYN: V
 SF: $\lambda y \lambda x \lambda e. e : (\text{BECOME} (\neg \text{HAVE}(x, y)))$

The assumption is that depending on the contextual specification of the two-place predicate HAVE either as denoting a relation of concrete, physical possession or as denoting a relation of abstract possession on the level of CS the different readings of the verb in (9) and (10) emerge.

Our attitude towards the Two-Level Model is a twofold one. On the one hand, we agree that levels of meaning of different specificity should be distinguished. Particularly, our proposal outlined in chapter 6 and 7 adopts this idea and wants to advance it in several respects. On the other hand, we observe some difficulties that come with the implementation of decomposed meaning structures:¹²

Firstly, it appears that in decompositional analyses like that one proposed the eventuality structure of verbs is not really represented in meaning structure. CAUSE and BECOME are used as propositional operators, although one would expect that they are directly related to eventualities. Furthermore ACT, representing the activity of the agent, is not used as a predicate of activities but of objects. Thus, the connec-

¹² See also the discussion in Dölling (2005).

tion to eventualities is only indirectly established via instantiation of 'eventuality-free' propositions.¹³

Secondly, it is a well-known problem of the decomposition strategy that structures containing CAUSE are logically weaker than the meaning of the verbs those structures should be the representations of (cf. e.g. Chierchia & McConnell-Ginet 2000 and Engelberg 2000). So, in conflict with the decompositional structure in (20), it is not the case that in every situation in which an action of x causes that y opens one can say that x opened y.¹⁴ In addition, it is not clear how under this condition, for instance, the meaning of verbs denoting eventualities of more specific openings, i.e. verbs like *aufreißen* 'rip open', *aufbrechen* 'break open', *aufriegeln* 'unbolt' or *auftrennen* 'undo' can be represented.

Thirdly, it is an open question whether decompositional structures of the given kind can adequately cover all variations of primary meaning. Generally, we doubt that such representations yield sufficient conditions for the contextual identification of the several non-systematic meaning variants of a verb. For instance, it is not clear how the actual differentiation of meaning like that in (7) works if the SF of *öffnen* in (20) is taken as a starting point. Obviously, to specify only the one-place predicate OPEN is not enough for getting the right reading of the verb. But if so, which of the other primitives occurring in the decompositional structure should be specified too and how should it be done in coordination with each other? Moreover, as according to (20) the eventualities of opening have to involve an activity the SF is not qualified for uses of the verb in sentences that describe situations lacking an agent.¹⁵

Our general comments on lexical decomposition hold analogously for the approach of Rappaport Hovav & Levin (1998, 2003), which is at present very influential. Its basic idea is that the lexical meaning of verbs has to be divided into an idiosyncratic and a structural part. The latter one is a composition of lexical semantic templates that are based on the decompositional format of Dowty (1979). (24) illustrates such schematic eventuality structures:

¹³ For a Dowty-style procedure of semantic decomposition that in contrast reflects the eventuality structure immediately see e.g. Parsons (1990).

¹⁴ For instance, it is possible that a person unintentionally causes the opening of a door (e.g. by means of an air draft), but one would not say that the person opened the door.

¹⁵ Cf. examples given in footnote 7. Egg (1994) demonstrates that an exclusively decompositional approach to lexical SF has to fail, because often such structures set the boundaries for possible meaning variations too narrow. He proposes to combine it with a lexical network approach.

- (24) a. activity: [x ACT<MANNER>]
 b. states: [x <STATE>]
 c. achievements: [BECOME [x <STATE>]]
 d. accomplishments1: [[x ACT<MANNER>]CAUSE[BECOME[y <STATE>]]]
 e. accomplishments2: [x CAUSE [BECOME [y <STATE>]]]

The idiosyncratic information of singular verbs, i.e. their constant 'core' meaning enters the templates at the position designated by the angled brackets.

Levin and Rappaport Hovav use these kinds of semantic representations to explain, for instance, the different types of transitive/intransitive alternations. Thus, a verb like *sweep* has the representation in (25a) whereas a verb like *melt* the one in (25b).

- (25) a. [x ACT<SWEEP> y]
 b. [x CAUSE [BECOME [y <LIQUID>]]]

According to the authors (25a) shows that activities of sweeping have a prototypical theme (indicated by y) which is the reason for the grammaticality of the intransitive use of *sweep* (cf. (2c)). Furthermore, because the verb denotes activities it always realises an agent. Thus the theme can never appear as subject NP (cf. (2b)). Contrary to the behaviour of *sweep*, the representation of *melt* is determined by the fact that this verb denotes changes of state or activities bringing about of such changes. The theme of the respective eventualities can never be omitted (cf. (1c)), but it can be realised as subject (cf. (1b)).

The approach also takes the extension of argument structures into account in that the semantic templates in (24) can be integrated in more complex ones by a process called *template augmentation*. This mechanism is supposed to determine the possibility of alternations like that in (26a) and (26b) and the impossibility of those in (26c) and (26d).

- (26) a. Otto swept the floor clean.
 b. Otto swept the crumbs in the corner.
 c. *Otto swept the crumbs.
 d. *Otto swept in the corner.

Essentially, such template augmentations and, with it, differentiations of verb meaning are performed in the lexicon.¹⁶

We concede that the investigations by Levin and Rappaport Hovav have delivered extensive data and, moreover, interesting generalizations

¹⁶ Another lexical procedure of argument extension is suggested in Wunderlich (2000).

on systematic meaning variation of verbs. But we have to say that the proposed analysis is in several respects too informal and vague for considering it a definitive explanation of the phenomena.¹⁷ In addition, the approach does not address the determination of the idiosyncratic part of verbal meaning and, with it, the specific potential of non-systematic variation of verbs.

So far we have discussed theories that all belong to the first type of intermediate approaches to verb semantics. A representative of the second type – taking a meaning variant as the basic meaning of the verb – is Pustejovsky's *Theory of the Generative Lexicon* (1991, 1995).¹⁸ The author starts out from the assumption that in the lexicon a verb can have a single semantic representation that reflects only one of its primary meaning variants. For example, he supposes that the verb *bake* denotes in its lexical meaning a property of changes of state as in (27a).

- (27) a. Paul baked a potato.
 b. Paul baked a cake.

By way of contrast, the reading in (27b), where *bake* denotes a property of creative actions, is the result of a coercion of meaning, i.e. a shift to another meaning variant of the verb.

Although the idea of a generative lexicon seems rather appealing, two major problems of Pustejovsky's approach have to be pointed out: Firstly, it is absolutely unclear why one primary meaning variant of a verb should be the most basic one and the other variants have to be derived from it. There is, for instance, no explanation for the differing significance of the two occurrences of *bake* in (27). Secondly, the postulated operation of coercion impairs the grammatically determined process of combination, which results in a violation of the principle of semantic compositionality. This violation is due to Pustejovsky's assumption that the lexicon contains elements of genuine encyclopaedic knowledge, which can be inserted into semantic structure by means of coercion.¹⁹

What this short survey about intermediate analyses should demonstrate is that in spite of attempts to reduce the number of lexical semantic representations for one and the same verb, there are still quite a few non-trivial problems with the formalisms used in the several proposals.

¹⁷ See for a more detailed analysis e.g. Engelberg (2000) and Piñón (2001).

¹⁸ It should be noted that in other respects Pustejovsky is also an adherent of the strategy of lexical decomposition.

¹⁹ See for a general criticism Fodor & Lepore (1998).

5 Minimalist Analyses

Minimalist approaches give up on the lexicalist position and, hence, try to shift the major burden of meaning determination away from the lexicon. The lexical semantics of verbs is reduced as much as possible to an abstract minimum – prototypically presented in Ruhl (1989)²⁰ – or even it is regarded as generally inaccessible during the grammatical computation – as recently argued by Borer (2005). The determining factor for the respective meaning variant of a verb is the syntactic and conceptual context in which the verb occurs. This means that syntactic and pragmatic aspects of verbal meaning gain considerably in importance compared to lexical semantic specifications. For instance, Marten (2002) explicitly argues for an approach in which the utterance meaning is the mere result of an interaction of syntactic and pragmatic processes.²¹

In the realm of minimalist analyses the constructionist strategy is an important one. All theories of *Construction Grammar* share the assumption that the meaning of a verb in a particular syntactic context results from an interrelation between the lexical meaning of the verb and the meaning of the respective construction. Especially, Goldberg (1995) argues for an analysis of argument structure as an abstract meaning of syntactic constructions and, therefore, as independent of the lexical semantic representation of verbs (cf. also Fillmore, Kay & O'Connor 1988 and Fillmore, Kay, Michaelis & Sag 2003). The verbal predicate itself possesses a concrete participant structure that has to agree with the particular argument structure. Otherwise the verb can not be embedded in the respective syntactic construction. Essentially, the constructions themselves can also contribute argument positions that have no corresponding participant role in the lexical entry of the verb.

As an example, the representation of the 'caused motion' construction analyzed by Goldberg is given in (28).

(28)	SEM: CAUSE-MOVE	<AGENT,	THEME,	PATH/GOAL>
	PREDICATE	<		>
	SYN: V	SUBJ	OBJ	OBL _{directional}

A verb like *throw* can occur in a sentence like (29), which instantiates the construction.

²⁰ As is noted by the author, this work is done subsequent to Bierwisch (1983).

²¹ Marten's framework is based on the *Dynamic Syntax* of Kempson, Meyer-Viol & Gabbay (2001) and the *Relevance Theory* of Sperber & Wilson (1986/1995).

- (29) Sam threw the ball against the wall.

The two participant roles of the verb – 'thrower' and 'throwee' – are compatible with the two argument positions of the construction – agent and theme, respectively. Furthermore, the construction adds the path argument position and, with it, specifies the meaning of the verb.

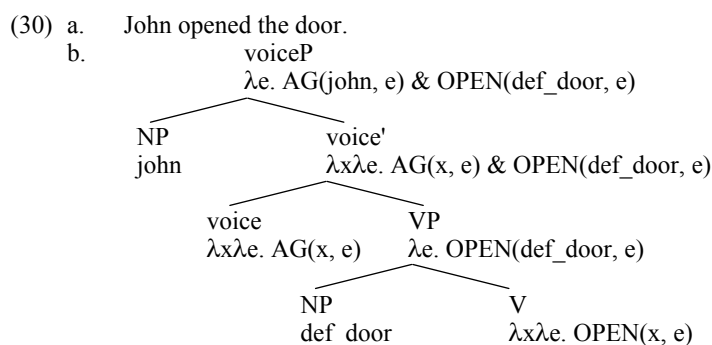
Although till now it is controversial what the source of these abstract meanings of syntactic constructions should be the idea to separate argument positions from the verb seems to be a promising one. Therefore we want to discuss this strategy of separation in a little more detail.

Traditionally, argument structure is analyzed as part of the lexical entry of a verb. Consequently, the projection of syntactic structure is viewed as depending on the kind of argument structure the verb brings in (e.g. transitive vs. intransitive). All the known linking theories are developed in this realm of thinking. Over the past years, however, such lexicalist approaches have been come under attack by reason of owning the disadvantage to be fundamentally redundant in that the projected syntactic structure has to agree with the lexical properties of the listed items (cf. e.g. Borer 1994, 2005, Ritter & Rosen 1998 and Ramchand 2006). The redundancy originates from the double notation of the argument positions, first in the lexical argument structure and second in the syntactic subcategorization. Thus, linking mechanisms have to be a necessary part of those theories because otherwise it could not be assured that an (semantic) argument position is connected to the adequate (syntactic) complement. In view of the massive variability that verbs show with respect to their arguments a further difficulty has been pointed out. If argument positions are represented as part of the lexical semantic representation it is necessary to include all the different possibilities of argument structures and, hence, of meaning variants for one verb in the lexicon.

Kratzer's (1996, 2003) proposal to sever the external argument from its verb can be regarded as a response to this challenge. Following Marantz (1984), she argues that there are many sentences like those in (7) where a particular sort of internal argument triggers a particular meaning variant of the verb, and claims that there are only a few instances where an external argument does the same. According to her, this observation can be explained if external arguments are not any longer analyzed as true arguments of verbs. Instead, Kratzer proposes that a (non-overt) functional head called *voice* carries the thematic information about the subject argument. The subject NP itself is located in the specifier position of *voice*P.

As the external argument positions are introduced in the syntactic derivation they have not to be included in the lexical meaning structure of the verbs. More specifically, Kratzer uses a mixture of the (classical) Davidsonian and the neo-Davidsonian²² format of semantic representation. External arguments are represented as arguments of separate neo-Davidsonian predicate constants like AG(ent), whereas all other thematic arguments (e.g. object NPs) are represented as true arguments of Davidsonian verbal predicates.

The lexical semantic representation of a verb like *open* in its transitive variant is now a two-place predicate without an agent argument position. We illustrate a simplified derivation of sentence (30a) in (30b).



The introduction of the external argument is only successful if there is a mechanism that ensures the identity of the two eventualities in the above structure (the eventuality that comes with the verb and the one the AG-predicate is applied to). To this end, a principle of event(uality) identification is assumed.

While numerous researchers agree on the sketched treatment of external arguments,²³ there is an ongoing debate about the status of the internal arguments. For instance, Williams (2007) counters Kratzer's claim that they should be generally treated as true arguments of the

²² The term *neo-Davidsonian* is used for a representational format which separates a verb meaning into a predicate constant of eventualities and one or more thematic predicate constants denoting relations between eventualities and their participants. Cf. Parsons (1990, 1995) and Schein (1993).

²³ See e.g. von Stechow (1996), Pyllkänen (1999, 2006) and Beck & Johnson (2004). Von Stechow argues extensively for a separation of the external arguments on the basis of an analysis of the adverb *again*. He assumes that *again* in its repetitive reading is higher located than voiceP, whereas in its restitutive reading it must be below voiceP. If the agent would be a true argument of the verb the sensitivity of the adverb for its syntactic position could not be explained.

verb. William's analysis of data from Igbo and Mandarin advocates that patient predicates should be introduced by the VPs, but not by the verbs. Based on this, a conclusion of broader relevance is abstracted: We need to distinguish between what sort of eventuality a verb is related to, and what combinatory requirements are associated with the verb lexically. A verb need not have as many lexical argument positions as the eventualities referred to have participants.

Borer (2005) extends the idea of separation to any internal arguments. According to her, there is no need for a lexically represented argument structure because all thematic predicates are imposed by the syntactic construction in which the verbs occur. Generally, the argument structures of verbs are computed syntactically by means of various functional heads and independently of lexical information. In fact, Borer goes further and develops a rather radical minimalist theory. She is interested in the question why lexical items are so much more flexible with respect to the context they can be used in and, thus, in their concrete meaning than the syntactic structures themselves. To explain this notorious difference in flexibility, Borer reasons that the role syntactic configurations play in the determination of meaning has to be considered to a greater extent.

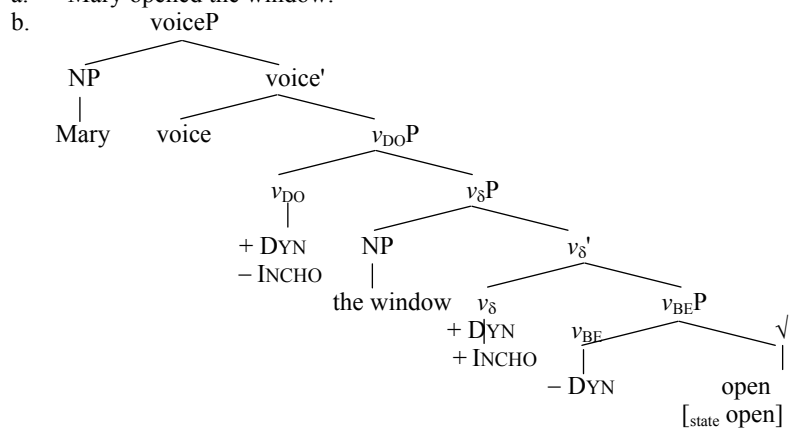
The analysis of the constructionally determined parts of meaning is one of the main purposes of Borer's (2005) neo-constructionist approach to grammar, called the *Exo-Skeletal Model*.²⁴ Within this framework the assumption of a lexicon as a store for word meanings is questioned altogether. Borer understands verbs – as well as nouns and adjectives – as concealed 'conceptual packages' which are embedded in the syntactic structure without affecting the structure or being affected themselves. Only after the syntactic structure has gained a grammatically determined meaning the 'conceptual packages' open and their content has to be verified with the structural meaning. This verification process takes place at a 'making sense' component, which is different from both the grammatical and the conceptual system. It is at this point that the meaning variant of a verb is determined with the help of the information of its thematic arguments. As a consequence, for instance, the choice between the causative and the inchoative variant of verbs like *melt* or *open* is licensed through syntactic structure.

Actually, the proposal by Borer is closely related to a second, more recent line of the strategy of meaning decomposition, which follows the

²⁴ Notice that Borer follows the generative tradition whereas most adherents of the classical constructionist strategy adopt basic positions that are closely connected to Cognitive Grammar.

idea that eventuality structure expressed by a verb is explicitly encoded in syntax. Generally, lexically stored decompositional representations of verb meaning are not anymore supposed. Instead, for instance, Lin (2004) argues that meaning variants of verbs should be viewed as being compositionally constructed from a universal inventory of primitives linked immediately to functional heads and an open class of 'verbal roots'.²⁵ Following the author, a sentence like (31a) which contains the causative variant of *melt* has the syntactic 'eventuality' structure (31b) and can be interpreted as (31c).

(31) a. Mary opened the window.



c. $\lambda e. \text{ARG}_{\text{ext}}(\text{mary}, e) \ \& \ \text{DO}(e, [\text{activity } \text{undef}]) \ \& \ \exists e' \exists s [\text{BE}(s, [\text{state } \text{open}]) \ \& \ \text{BECOME}(e', s) \ \& \ \text{ARG}_{\delta}(\text{def_window}, e') \ \& \ \text{CAUSE}(e, e')]$

In (31b) the verbalizing heads v_{DO} , v_{δ} and v_{BE} can be viewed as corresponding to the traditional primitives DO (or ACT), BECOME and BE, respectively. Moreover, it appears that the semantic representation in (31c) is similar to decompositional structures proposed in Parsons (1990). The labels ARG_{ext} and ARG_{δ} denote thematic relations which involve the external argument (introduced by voice) and the internal argument associated with v_{δ} , respectively. Finally, $[\text{state } \text{open}]$ is used to represent the idiosyncratic part of meaning of the verb *open*, i.e. its 'verbal root'.

²⁵ For further approaches being partly very distinct from Lin's one as well as from each others cf. e.g. Hale & Keyser (1993), von Stechow (1995, 1996), Ritter & Rosen (1998), Travis (2000) and Ramchand (2006).

What can be concluded from the consideration of the various approaches is the tendency to reduce the lexical information to an absolute minimum in order to keep the variability in the use of verbs. On the one hand, we think that in pursuing this intention minimalist analyses are on the right track. Obviously, beside conceptual contexts of utterance the syntactic constructions a verb occurs in have more influence on meaning variation than it is commonly assumed. For this reason, lexical semantic representations of verbs should contain as few as possible structural restrictions. In particular, we sympathize with the idea that thematic information is not simply projected from the lexicon.

On the other hand, however, there have to be made some critical points with respect to actual implementations of the minimalist strategy. Generally, we disbelieve the adequacy of structures that essentially result from a transfer of the device of lexical decomposition into syntax. Such structures are not only subject to most of our comments made above in regard to versions of Dowty's framework. They have to be also questioned for the fact that now verbs own no independent lexical semantic representation at all. Thus, it seems that the syntactic line of meaning decomposition overshoots the mark. Especially, Borer's (2005) theory ultimately aims at the complete elimination of verb semantics as part of the lexicon and, with it, of the grammatical system. By way of contrast, we claim that there has to be a minimal residual of lexical semantic representation of the verbs to gain a conceptually adequate use of them. In the next chapter we outline a minimalist approach which takes into account this requirement.

6 Lexical Semantic Form of Verbs and Grammatical Computation

Our point of departure is the observation that the linguistic form drastically underdetermines the conceptual information that is conveyed with an utterance. Therefore, we distinguish between two major phases of the process of understanding: Firstly, in the phase of semantic composition, which is part of the grammatical computation, the context-independent and, hence, merely formal meaning of the utterance is calculated. Secondly, in the phase of pragmatic interpretation its contextually specified meaning is obtained by means of inferences integrating the formal meaning base with accessible elements of conceptual knowledge. As a consequence, each understanding process contains some procedures of

pragmatic enrichment, which decisively contribute to determining the kind of meaning called traditionally the *semantic content* of utterance.²⁶

More specifically, we suppose a *Multi-Level Model of Meaning* (see Dölling 1995, 1997, 2003, 2005), which can be understood as an exploration of the Two-Level Model. Its basic idea is that the understanding process comprises a number of different levels over which the content of an utterance has to be spelled out step by step. Two of the various meaning levels are of particular interest to the topic dealt with here – the level of semantic form SF and that one called *parameter-fixed structure PFS*.

Structures at the SF level, which represent the formal meaning of expressions and, therefore, form the starting point for interpretation, have two crucial properties: Firstly, they are built up strictly compositionally, i.e. they are determined exclusively by the lexical items occurring in that utterance and the manner of their syntactic combination. Thus, any interference with the autonomously organized level of SF by making reference to conceptual knowledge is excluded. Secondly, SF structures are radically underspecified with regard to the conceptual information conveyed.²⁷ They contain a lot of parameters, i.e. free variables that can be substituted by constants from a particular domain assigned to the singular parameter. It is just such a contextually licensed fixing of SF-parameters with values that allows for considerable variation in the meaning of utterances.

The level of PFS succeeds immediately that of SF. Structures at this level are conceived as the first intermediate results in the course of contextually specifying the meaning of expressions. They differ from SF structures insofar as the parameters occurring in the latter are now replaced by suitable constants. It appears that several mechanisms of defeasible reasoning have an important part in this process of pragmatic enrichment.²⁸ By means of them information being not present in SF but necessary for grasping the concrete meaning of the respective ex-

²⁶ For a similar attitude towards the understanding process and, with it, the roles semantics and pragmatics have to play in cf. e.g. Hobbs et al. (1993), Carston (1999, 2002), Levinson (2000) and Recanati (2004).

²⁷ Underspecified meaning structures are used in semantic research already for some time to explain various phenomena like scope ambiguity, anaphora, lexical ambiguity and 'reinterpretation' of expressions. See e.g. Reyle (1992), Pinkal (1996), van Deemter & Peters (1996) and Egg (2005).

²⁸ As inference procedures of this kind one can think of, for instance, such of abduction (e.g. Hobbs et al. 1993, Dölling 1997, Blutner 1998, Maienborn 2001, 2003), explicature (e.g. Carston 1999, 2002) and generalized conversational implicature (e.g. Levinson 2000, Blutner 2002).

pressions is inferred from the conceptual knowledge base. In this manner, PFS represents the very level on which meaning variations of the kind we are concerned with take place.

In contrast to other minimalist analyses and, particularly, to Borer (2005), we take it for granted that along the lines of the phonological and syntactic information of a verb its lexical semantic representation participates in the grammatical computation as an autonomous unit. Essentially, our assumption is that the SF of the verb should be analysed as a basic building block of the SF of utterances in which it occurs. But as the verbs are open to a plurality of variations of their primary meaning, one has to take care of that their lexical SFs allow for each of these differentiations by fixing SF-parameters respectively.

For illustrating, in (32) we propose a lexical entry for *öffnen*, which is provisional in several respects.

- (32) PF: /œffn-/
 SYN: V, [α /NP_{acc}][β /NP_{dat}]/NP_{nom}
 SF: $\lambda e. OPEN(e)$ } GRAMMAR
- PRAG: (i) $\alpha = -$ and $\beta = -$ iff $\langle OPEN \rangle = \{OPEN_{k1}, OPEN_{k2}, \dots\}$
 (ii) $\alpha = +$ and $\beta = -$ iff $\langle OPEN \rangle = \{OPEN_{i1}, OPEN_{i2}, \dots\}$
 (iii) $\alpha = -$ and $\beta = +$ iff $\langle OPEN \rangle = \{OPEN_{m1}, OPEN_{m2}, \dots\}$
 (iv) $\alpha = +$ and $\beta = +$ iff $\langle OPEN \rangle = \{OPEN_{n1}, OPEN_{n2}, \dots\}$

Unlike the analyses considered so far, the entry consists of four components. Whereas the lexical components *PF*, *SYN* and *SF* constitute its grammatical part, i.e. that one which is the basis for the grammatical computation including the composition of SF, the component PRAG is an additional, extra-grammatical part which is relevant for the process of pragmatic enrichment.

Following Krifka (1989, 1992), in order to represent the lexical meaning of verbs we use the non-decompositional neo-Davidsonian format. Therefore, in (32) the SF of *öffnen* is identified with the one-place predicate $\lambda e. OPEN(e)$ over eventualities, i.e. no thematic argument positions are included in it. Thus, the lexical semantic representation is independent of the varying number and sort of arguments that are available in the syntactic structures in which the verb is embedded. However, for restricting the set of such syntactic constructions in a way, we assume that the component SYN clarifies the primary subcategorization frames of the verb. The notation [α /NP_{acc}][β /NP_{dat}]/NP_{nom} indicates that *öffnen* can be used in a ditransitive, a transitive as well as an intransi-

tive variant.²⁹ Consequently, by default, the verb is allowed to occur in syntactic structures exemplified by sentences like in (33).

- (33) a. Hans öffnete der Mutter die Tür.
Hans opened the door for the mother.
b. Hans öffnete der Mutter.
Hans opened for the mother.
c. Hans öffnete die Tür.
Hans opened the door.
d. Hans öffnete.
Hans opened.

Supposing such constraints over possible subcategorization frames does not mean that it is impossible that the verb appears with other argument structures. But then the respective structures have to be licensed by additional conditions on its syntactic context.

Another essential property of the SF in (32) is that *OPEN*³⁰ is a parameter which has yet to be contextually fixed with one-place predicate constants denoting various types of opening. Thus, in the lexicon the meaning of *öffnen* is not represented by means of either a specific constant *OPEN* or a decompositional structure like such ones considered above. For this reason, along with the separation of thematic argument structure, the lexical SF of a verb can be regarded as being not more than a 'pointer' that helps to identify its appropriate meaning variant under the respective contextual conditions. It is in this sense that SFs are radically underspecified.

PRAG, finally, is the lexical component that contributes significantly to the fixation of *OPEN*. It comprises the conditions for determining the domain of values of the SF-parameter in dependence on the syntactic context in which the verb occurs. As an example, condition (i) specifies that the domain of values of *OPEN* has to be identified with the set containing predicate constants like *OPEN_{k1}* or *OPEN_{k2}* as members if the verb is used intransitively. Analogously, according to condition (ii) a member of the set containing *OPEN_{l1}*, *OPEN_{l2}* etc. has to be substituted for *OPEN* if the verb is subcategorized for a nominative and an accusative NP. Which of the values out of the particular domain then is actually selected in the process of pragmatic enrichment is dependent on the kind of entities which the argument NPs refer to and, possibly, on further contextual conditions.

²⁹ In respect of [α X] and [β X] we suppose an analogous convention made for the entry in (21).

³⁰ In the following SF-Parameters are always marked by italics.

Evidently, a lexical entry like in (32) faces the problem how the several meaning variants of the verb can combine with their argument structure. Our proposal is that the information about the respective argument positions is brought in by means of independent configurations that are inserted in the process of SF composition and contain further SF-parameters. The insertion of these SF structures is triggered by the syntactic structure building process.³¹

There are at least two different ways of characterizing those configurations: Firstly, following Kratzer (1996, 2003), they could be understood as the contributions of some functional categories to the computation of SF. One consequence of this assumption is that the introduction of argument positions is directly linked to the generation of syntactic structure. Secondly, the configurations can be seen as special SF-operators of logical type shifting (or coercion).³² Such operators do not have syntactic correlates. Rather, they are only inserted in SF composition if a logical type conflict would emerge otherwise.

The λ -expression in (34) illustrates how such a SF-operator could look like.

$$(34) \text{ ARG}_{acc}: \lambda P \lambda x \lambda e. \theta_{acc}(x, e) \ \& \ P(e)$$

ARG_{acc} shifts one-place predicates into two-place predicates. As is indicated by the index, in doing so the operator introduces the argument position that can be occupied by the SF of an accusative NP. θ_{acc} acts as an SF-parameter whose domain of values comprises those predicates of thematic relations that are possible for arguments in that syntactic position. Although the pragmatic conditions for the fixation of that sort of parameters have still to be specified, it appears that, for instance, the predicate constant TH(eme) is a suitable value for θ_{acc} whereas the predicate constant AG(ent) is not such one. In analogy to ARG_{acc} SF-operators like ARG_{nom} or ARG_{dat} are assumed to account for the introduction of further argument positions.

³¹ Krifka (1989, 1992) suggests that the predicate constants representing the thematic relations should be part of the meaning of the argument NPs. To avoid unacceptable combinations, Krifka assumes that verbs and their complements possess thematic features in their syntactic characterizations. Only if these features are compatible the combination is allowed. But this means that genuine conceptual information is transferred to the syntax and that is an undesirable result. Furthermore, the relations of participation can vary. In such cases Krifka's solution forces the assumption of more than one meaning for one and the same NP, what cannot be motivated independently.

³² Cf. the proposal by Marten (2002). For a more general framework of logical type shifting see e.g. Partee (1987, 1995).

In (35) we give a simplified SF derivation to demonstrate the establishing of thematic argument structure.

- (35) a. Hans öffnete die Tür. (= 33c)
 b. öffnen: V, [α /NP_{acc}]/[β /NP_{dat}]/NP_{nom}; λe . *OPEN*(e)
 | ARG_{acc} : $\lambda P\lambda x\lambda e$. $\theta_{acc}(x, e)$ & P(e)
 | /
 öffnen: V, /NP_{acc} [β /NP_{dat}]/NP_{nom}; $\lambda x\lambda e$. $\theta_{acc}(x, e)$ & *OPEN*(e)
 |
 die Tür: NP_{acc}; def_DOOR
 | /
 die Tür öffnen: VP, [β /NP_{dat}]/NP_{nom}; λe . $\theta_{acc}(def_DOOR, e)$ & *OPEN*(e)
 | ARG_{nom} : $\lambda P\lambda x\lambda e$. $\theta_{nom}(x, e)$ & P(e)
 | /
 die Tür öffnen: VP, /NP_{nom}; $\lambda x\lambda e$. $\theta_{nom}(x, e)$ & $\theta_{acc}(def_DOOR, e)$ & *OPEN*(e)
 |
 Hans: NP_{nom}; hans
 | /
 Hans die Tür öffnen: S; λe . $\theta_{nom}(hans, e)$ & $\theta_{acc}(def_DOOR, e)$ & *OPEN*(e)

As shown in (35b), the occurrence of the accusative NP *die Tür* requires a type shifting of the lexical SF of *öffnen*. The application of ARG_{acc} results in a shifted SF of the verb that now disposes of a thematic argument position for the SF of *die Tür*. Thus, we get the composed SF of the VP *die Tür öffnen*, which is again a one-place predicate over eventualities. Subsequently, in order to meet also the requirement of the nominative NP this SF is shifted by means of ARG_{nom} . In a final step, the SF of *Hans* occupies the argument position arising from that operation.

Although the procedure sketched seems rather simple to realize it is surely not adequate with respect to syntactic considerations. Therefore, we are convinced that the first option of establishing the thematic argument structure, namely, via functional categories has to be preferred.

The main difficulty in pursuing this option, however, is whether internal argument positions can be introduced in the same manner as Kratzer (1996, 2003) has proposed it for the external one. A short look at the data reveals that, for instance, the influence of the direct object (or accusative) NPs on the interpretation of the respective structures is manifold. Whereas the direct objects of verbs of creation and consumption force a telic interpretation of the eventuality predicate, i.e. the predicate denotes an attribute of events if they have a quantized refer-

ence (see (36b)), there is no such interpretational effect with verbs of transportation amongst others (see (36c)).³³

- (36) a. Peter aß zehn Minuten lang/*in zehn Minuten Brot.
Peter ate for ten minutes/*in ten minutes bread.
- b. Peter aß *zehn Minuten lang/in zehn Minuten eine Scheibe Brot.
Peter ate *for ten minutes/in ten minutes a slice of bread.
- c. Peter schob zehn Minuten lang/*in zehn Minuten einen Wagen.
Peter pushed for ten minutes/*in ten minutes a cart.

Borer (2005) proposes that the direct object NPs have different positions in the syntactic hierarchy depending on their influence on the eventuality structure. This means that a NP like *das Hemd* has to be introduced in the specifier position of the aspect category in a sentence like (37a). Unlike that, the position of *das Hemd* in sentence (37b) will be the specifier of a default category only serving the identification of participants of the described situation.

- (37) a. Anna bügelte das Hemd in 5 Minuten.
Anna ironed the shirt in 5 minutes.
- b. Anna bügelte das Hemd 5 Minuten lang.
Anna ironed the shirt for 5 minutes.

But notice that it is unclear in which position the NP has to be localized if there is no temporal modification clarifying the aspectual interpretation.

The problem to be resolved is whether direct objects – in opposition to the introduction of the external arguments via the voice category – generally disallow a uniform treatment with respect to their syntactic position. This problem is linked to Kratzer's (2003) criticism that a separation of the internal arguments from the verbs would lead to an overgeneralization with regard to the generation of transitive structures.

In addition to the difficulties concerning the treatment of direct objects and their introduction into the syntactic construction, the sentences in (38) show that there are also a number of questions with respect to the analysis of indirect objects and the differentiation between them and adjuncts.

- (38) a. Peter schrieb dem Mann einen Brief.
Peter wrote the man_{dat} a letter.
- b. Martin brach seinem Bruder einen Zeh.
Martin broke his brother_{dat} a toe.

³³ Cf. also the sentences in (3) and (4).

- c. [?]Gunnar fand seiner Frau den Handschuh.
[?]Gunnar found his wife_{dat} the glove.
- d. *Margit erreichte dem Kind den Bahnhof.
 *Margit reached the child_{dat} the station.

One question is whether dative NPs like those occurring in (38a) – (38c) are arguments of verbal expressions at all.³⁴ Obviously, the proposal of Marten (2002) to treat any verbal adjunct as argument provides no real solution, because it does not offer an explanation why then not all verbs allow such an extension of their argument structure as the unacceptability of sentence (35d) shows.

The preceding discussion has indicated that the problem with the status of the internal arguments of verbal expressions is a rather intricate one. What has to be clarified in future research is how, for instance, the information about object positions is connected to the appropriate functional category to result in an acceptable SF of the respective sentence. Our first step in direction to an answer is the assumption of a division of labour: thematic argument positions are not represented in the lexicon, but have a reflex in the syntactic component of the lexical entry of verb.³⁵

7 Meaning Variation and Parameter-fixed Structure of Verbs

So far we have explored what the lexical SF of a verb looks like and how it is inserted in the compositional SF derivation. In the following we want to outline how the contextual specification of the SF of an utterance works and, particularly, what kind of structure is achieved at the level of PFS.

For illustrating, consider again the sentence in (39a) along with its SF and PFS.

- (39) a. Hans öffnete die Tür. (= 33c)
 b. SF: $\exists e [\theta_{nom}(hans, e) \& \theta_{acc}(def_DOOR, e) \& OPEN(e)]$
 c. PFS: $\exists e [AG(hans, e) \& TH(def_DOOR, e) \& OPEN_{it}(e)]$

As is argued above, the PFS of an expression arises from its SF by fixing the SF-parameters with a suitable value. Accordingly, the structure in (39c) differs from that one in (39b) only in it that the free predicate

³⁴ The traditional analysis would claim that the dative NP in (38a) is the indirect object of the verb, whereas the dative NPs in (38b) and (38c) are so-called free (unselected) datives.

³⁵ For a similar assumption cf. Ramchand (2006).

variables θ_{nom} , θ_{acc} and $OPEN$ are substituted by the predicate constants AG, TH and $OPEN_{II}$ ³⁶, respectively.

Traditionally, a structure like the PFS in (39c) would be viewed as the semantic representation that the sentence immediately acquires in the process of grammatical computation of meaning. Similarly, the PFS in (40), which represents the particular reading of the verb involved in (39a), could be assumed as one of the lexical semantic representations of *öffnen*.

(40) PFS: $\lambda y \lambda x \lambda e. AG(x, e) \ \& \ TH(y, e) \ \& \ OPEN_{II}(e)$

But such an understanding disregards the fact that both structures are already the result of a pragmatic enrichment of the SF of expressions. It is in the process of PFS derivation that the formal meaning of the respective expressions is contextually specified to an individual meaning variant.

We suppose that the mapping from SF to PFS is established with the help of particular pragmatic conditions of fixation of SF-parameters. In (41) we have picked some of those conditions that take part in the PFS derivation concerned with.

- (41) a. $\theta_{nom} \Rightarrow AG$
 b. $\theta_{acc} \Rightarrow TH$
 c. $OPEN \Rightarrow OPEN_{II}$

It is obvious that numerous elements of world knowledge have to be consulted for the decision which values are suitable for the fixation of the parameters in the respective context. Thus, to achieve the PFS in (39c) and, with it, that in (40) we need to be acquainted with the conceptual conditions that determine the relationship between the various predicate constants occurring in the structures.

In (42) three meaning postulates that express conditions relevant for the interpretation of the verb *öffnen* in sentence (39a) are given.

- (42) a. $\square \forall e [OPEN_{II}(e) \rightarrow \exists x AG(x, e)]$
 b. $\square \forall e [OPEN_{II}(e) \rightarrow \exists x [DOOR(x) \ \& \ TH(x, e)]]$
 c. $\square \forall e [OPEN_{II}(e) \rightarrow \exists e' e'' xy [e = e' \oplus e'' \ \& \ AG(x, e') \ \& \ CAUSE(e', e'') \ \& \ TH(y, e'') \ \& \ \exists s [BECOME(e'', s) \ \& \ OPEN_{II}(s) \ \& \ TH(y, s)]]]$

³⁶ According to (ii) of PRAG in (32) the constant $OPEN_{II}$ is a member of the domain that is assigned to the parameter $OPEN$ if the verb *öffnen* is used transitively.

The data demonstrate that *schmelzen* has at least four meaning variants – a causative and an inchoative event-related reading like in (44) and (45), respectively, and a causative and an inchoative process-related reading like in (46) and (47), respectively. This means that in the first two sentences the verb is used in a telic interpretation and, therefore, applies to events of melting, but in the second two it has an atelic reading and, consequently, applies to processes of melting. Thus, whereas (44) and (45) refer to a change of state of the piece of ice, (46) and (47) describe only a process that does not result in a liquid state of the (whole) object referred to by the indefinite NP *ice*.³⁹ In addition, it appears that the sentence in (44) entails the other ones and each of the sentences in (45) and (46) entails that one in (47).

We assume a lexical entry for *schmelzen* as in (48), where in analogy to that one in (32) *MELT* is a SF-parameter and $MELT^{IE}$, $MELT^{IP}$, $MELT^{CE}$ and $MELT^{CP}$ are one-place predicate constants of inchoative events, inchoative processes, causative events and causative processes of melting, respectively.⁴⁰

- (48) PF: /ʃmelts-/
 SYN: V, [α /NP_{acc}]/NP_{nom}
 SF: $\lambda e. MELT(e)$
 PRAG: (i) $\alpha = -$ iff $\langle MELT \rangle = \{MELT^{IE}, MELT^{IP}\}$
 (ii) $\alpha = +$ iff $\langle MELT \rangle = \{MELT^{CE}, MELT^{CP}\}$

Like the entry for *öffnen*, in (48) there is a component PRAG which comprises the conditions for determining the domain of values of *MELT* dependently on the syntactic context.

In (44') – (47'), we give structures that can be viewed as the SF and the PFS of the sentences in (44) – (47), respectively.

- (44') a. SF: $\exists ex [\theta_{nom}(anna, e) \& A_PIECE_OF_ICE(x) \& \theta_{acc}(x, e) \& MELT(e)]$
 b. PFS: $\exists ex [AG(anna, e) \& A_PIECE_OF_ICE(x) \& TH(x, e) \& MELT^{CE}(e)]$
 (45') a. SF: $\exists ex [A_PIECE_OF_ICE(x) \& \theta_{nom}(x, e) \& MELT(x)]$
 b. PFS: $\exists ex [A_PIECE_OF_ICE(x) \& TH(x, e) \& MELT^{IE}(e)]$
 (46') a. SF: $\exists ex [\theta_{nom}(anna, e) \& ICE(x) \& \theta_{acc}(x, e) \& MELT(e)]$
 b. PFS: $\exists ex [AG(anna, e) \& ICE(x) \& TH(x, e) \& MELT^{CP}(e)]$

³⁹ Consequently, as decompositional analyses like the proposal in (21) regard the information on a result state as a necessary part of the lexical semantic representation of *schmelzen* they are confronted with a serious problem.

⁴⁰ For simplifying, the lexical entry disregards that, the verb *schmelzen* - similar to *öffnen* - can also be subject to non-systematic meaning variation.

- (47') a. SF: $\exists x [\text{ICE}(x) \ \& \ \theta_{nom}(x, e) \ \& \ \text{MELT}(e)]$
 b. PFS: $\exists x [\text{ICE}(x) \ \& \ \text{TH}(x, e) \ \& \ \text{MELT}^{\text{IP}}(e)]$

Again the PFSs emerge from the SFs by substituting the free predicate variables θ_{nom} , θ_{acc} and MELT by predicate constants being suitable with regard to the context.

In analogy to the example in (39), a number of postulates characterizing the various meaning variants of *schmelzen* have to be used to derive the PFS of the sentences and, with it, of the respective occurrences of the verb. So, for instance, the postulates in (49) are needed for determining the particular relations of participation in eventualities of melting.

- (49) a. $\square \forall e [\text{MELT}^{\text{CE}}(e) \vee \text{MELT}^{\text{CP}}(e) \rightarrow \exists xy [\text{AG}(x, e) \ \& \ \text{TH}(y, e)]$
 b. $\square \forall e [\text{MELT}^{\text{IE}}(e) \vee \text{MELT}^{\text{IP}}(e) \rightarrow \exists x \text{TH}(x, e)]$

Further meaning postulates that specify the different types of melting as well as their relationship to each other are given in (50) – (53).

- (50) a. $\square \forall e [\text{MELT}^{\text{CE}}(e) \rightarrow \exists e'xy [e = e' \oplus e'' \ \& \ \text{AG}(x, e') \ \& \ \text{CAUSE}(e', e'') \ \& \ \text{MELT}^{\text{IE}}(e'') \ \& \ \text{TH}(y, e'')]$
 b. $\square \forall e [\text{MELT}^{\text{CP}}(e) \rightarrow \exists e'xy [e = e' \oplus e'' \ \& \ \text{AG}(x, e') \ \& \ \text{CAUSE}(e', e'') \ \& \ \text{MELT}^{\text{IP}}(e'') \ \& \ \text{TH}(y, e'')]$
 (51) $\square \forall ex [\text{MELT}^{\text{CE}}(e) \ \& \ \text{TH}(x, e) \rightarrow \exists ye' [\text{SUBST}(y, x) \ \& \ \text{SUBST}(e', e) \ \& \ \text{MELT}^{\text{CP}}(e') \ \& \ \text{TH}(y, e')]]^{41}$
 (52) a. $\square \forall ex [\text{MELT}^{\text{IE}}(e) \ \& \ \text{TH}(x, e) \rightarrow \exists ye' [\text{SUBST}(y, x) \ \& \ \text{SUBST}(e', e) \ \& \ \text{MELT}^{\text{IP}}(e') \ \& \ \text{TH}(y, e')]]$
 b. $\square \forall ex [\text{MELT}^{\text{IP}}(e) \ \& \ \text{TH}(x, e) \rightarrow \exists ye' [\text{SUBST}(x, y) \ \& \ \text{SUBST}(e, e') \ \& \ \text{MELT}^{\text{IE}}(e') \ \& \ \text{TH}(y, e')]]$
 (53) $\square \forall ex [\text{MELT}^{\text{IE}}(e) \ \& \ \text{TH}(x, e) \rightarrow \exists s [\text{BECOME}(e, s) \ \& \ \text{LIQUID}(s) \ \& \ \text{TH}(x, s)]]$

Whereas the axioms in (50a) and (50b) serve the determination of the connection between causative and inchoative events and between causative and inchoative processes, respectively, the axioms in (51) and (52) define the relations between causative processes and events and between inchoative processes and events, respectively. Finally, the

⁴¹ The predicate constant SUBST is used to denote the substrate-from relation that holds analogously between substances and things as well as between processes and events. We follow Bach (1986, based on Link 1983) in assuming that the relations between processes and events can be analysed analogously to that between substances and things. In particular, this means that processes can be regarded as 'portions' of the respective event (see Piñón 1996 for an exemplification of that assumption).

axiom in (53) characterizes inchoative events of melting an object as resulting in a state such that it is liquid.

To be sure, the meaning postulates presented are still provisional and, therefore, have to be improved in several respects. However, they reveal the kind of conceptual knowledge that underlies systematic meaning variations of verbs like *schmelzen*. What is most important at the nature of such axioms is that entailment relations holding between sentences like those in (44) – (47) can be immediately justified by them.

8 Conclusion

This paper has addressed the question of how much of concrete meaning that a verb contributes to the conceptual information conveyed by utterances is really part of its lexical semantic representation. As we have demonstrated, the major challenge in answering this question is the huge amount of variation of the primary (or literal) meaning that many verbs show. In particular, two types of such alternations – the systematic and the non-systematic meaning variations – can be distinguished within the verbal domain. We have investigated to what extent the three different attitudes towards the lexical semantics of verbs deliver the precondition for overcoming this challenge.

The examination of maximalist approaches as well as intermediate ones has revealed that both strategies are accompanied with non-trivial problems. Maximalist proposals are based fundamentally on the assumption of lexical polysemy, which is undesirable due to reasons of lacking generalizations on the various meaning variants of one and the same verb. Furthermore, unless the respective approach assumes that alternative semantic representations of a complex expression are derived in parallel and, as a result, turns out to be uneconomical, the principle of compositionality in its strict sense cannot be maintained, because in many cases a recourse to conceptual world knowledge during the process of semantic computation is needed. Concerning the intermediate strategy we have observed that there are some serious difficulties connected with the framework of lexical decomposition used in the majority of its approaches. In particular, decompositional semantic representations have been demonstrated as being often inadequate because they set the boundaries for possible meaning variations of verbs too narrow.

We have suggested that minimalism is a promising way of thinking about lexical semantics of verbs. One advantage of this strategy is the elimination of redundant argument information from the semantic part

of the lexical entries of verbs. Instead, minimalist analyses assume that thematic predicates can be imposed by the syntactic construction in which the verbs occur. As a consequence, the thematic argument structures and, with it, the meaning variants of verbs are viewed as being licensed through syntactic structure. Being in agreement with the idea that a verb should impose as few as possible structural restrictions in the lexicon, however, we have cast doubt on several proposals to eliminate its lexical semantic representation as a primary constituent of grammatical computation altogether. By way of contrast, we have argued that there is a need for some semantic information even if a radically underspecified one that is given lexically and forms the basis for varying the meaning of verbs in context.

In the last part of the paper we have outlined our minimalist approach to lexical verb semantics. Basically, a distinction between two phases of understanding an utterance – the phase of semantic composition and that of pragmatic interpretation – has been made. Whereas the operations of the first phase result in a meaning structure that is determined by grammatical computation exclusively, in the subsequent one the contextually specified meaning of the utterance is derived by means of world knowledge. In concretizing this picture, we have offered a model that supposes a number of different levels over which the conceptual information conveyed by utterance is elaborated. In our considerations we have concentrated on two of the levels – the semantic form SF and the parameter-fixed structure PFS of expressions. SF structures are conceptually underspecified insofar as they include various kinds of parameters whose fixing with a value in the process of contextual specification gives rise to a PFS representing a meaning variant of the respective expression.

As we have shown, such an inventory of SF-parameters opens up the possibility to cover both types of primary meaning variation which verbs can be subject to. Essentially, the lexical SF of a verb has been regarded as a minimal device that helps to identify an appropriate meaning variant of the verb. In particular, no decompositional structure is used for representing the verb semantics in the lexicon. Rather, we have proposed that verbs are semantically represented by a one-place predicate structure over eventualities, which contains a SF-parameter that has to be contextually fixed with a predicate constant denoting a particular subtype of eventualities. Moreover, because the lexical SF does not involve any thematic argument positions it is independent of the varying number and sort of arguments that are available in the syntactic constructions in which the respective verb is embedded. For introducing argument positions, we have assumed particular SF configu-

rations that are inserted in the process of semantic composition. As such structures include an additional SF-parameter for thematic relation predicates, a further source of variation of verb meaning has been brought in. Finally, we have indicated how the contextual enrichment of a SF works and, as a result, what a PFS representing a particular meaning variant of a verb looks like. To explicate in detail how the PFS is actually derived during the process of pragmatic interpretation has to be left to future research.

9 References

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