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The distribution of meaning components – The composition of affectedness and light verb constructions

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Contents

Abbreviations

ACC accusative

AOR aorist

DAT dative

DEF definiteness

DIM diminutive

DP determiner phrase

GEN genitive

GER gerund

IMPF imperfective (aspect)

INDEF indefiniteness

INF infinitive

IPFV imperfect (tense)

LOC locative

LVC light verb construction

NEG negation

NP noun phrase

NUC nucleus

NVE non-verbal element [phrasal element of an LVC]

PF perfective

PL plural

POSS possession

PPART passive participle

PP prepositional phrase

PST past

RP referential phrase

SG singular

V verb

Preface

This document is my 'habilitation thesis' *Habilitationsschrift* submitted to the Philosophical Faculty at Heinrich-Heine University Düsseldorf in December 2019. The habilitation processes has been successfully completed in December 2020.

The thesis is a summary on eight different papers which are united under a common topic. The different papers investigate the semantic composition of two phenomena: affectedness and light verb constructions. The common topic of the papers is – as the title of the thesis already states – the distribution of meaning components.

The current document only contains the summary, the individual papers summarized in the thesis are not contained within the document. A number of papers is accessible online, e.g. Fleischhauer (2018a); Fleischhauer et al. (2019); Fleischhauer & Neisani (2020). If you like getting a copy of one of the other papers, just contact me: fleischhauer@phil.uni-duesseldorf.de.

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Die letzten drei, denen ich danken möchte, sind Angela, Jannes und Jonah. Für euch ist diese Schrift!

List of papers

The following individual papers are included in the current thesis. For each paper, I provide the exact reference; for non-single-authored papers, I also indicate each individual author's contributions to the paper. All papers were peer-reviewed.

(i) Czardybon, Adrian & Jens Fleischhauer. 2014. Definiteness and perfectivity in telic incremental theme predications. In Doris Gerland, Christian Horn, Anja Latrouite & Albert Ortmann (eds.). *Meaning and Grammar of Nouns and Verbs*, 373–400. Düsseldorf: Düsseldorf University Press.

Both authors contributed equally to the joint paper. The language data were jointly elicited from native speakers.

(ii) Fleischhauer, Jens & Adrian Czardybon. 2016. The role of verbal prefixes and particles in aspectual composition. *Studies in Language* 40(1): 176–203.

Both authors contributed equally to the joint paper.

(iii) Fleischhauer, Jens. 2018. Animacy and affectedness in Germanic languages. *Open Linguistics* 4: 566–588.

(iv) Fleischhauer, Jens & Ekaterina Gabrovska. 2019. Perfectivity and atelicity: The role of perfective aspect in aspectual composition. In Emmanuelle Roussel, Adeline Patard & Rea Peltola (eds.). *Cross-linguistic Perspectives on the Semantics of Grammatical Aspect*, 97–126. Leiden: Brill.

The analysis builds on previous work done by Jens Fleischhauer & Adrian Czardybon (Fleischhauer & Czardybon, 2016). Jens Fleischhauer contributed the analysis, Ekaterina Gabrovska provided the Bulgarian language data.

(v) Fleischhauer, Jens & Thomas Gamerschlag. 2019. Deriving the meaning of light verb constructions – A frame account of German *stehen* 'stand'. In Constanze Juchem-Grundmann, Michael Pleyer & Monika Pleyer (eds.). *Yearbook of the German Cognitive Linguistics Association, Vol. 7*, 137–156. Berlin/Boston: Mouton de Gruyter.

Both authors contributed equally to the joint paper.

(vi) Fleischhauer, Jens, Thomas Gamerschlag, Laura Kallmeyer & Simon Petitjean. 2019. Towards a compositional analysis of German light verb constructions (LVCs) combining Lexicalized Tree Adjoining Grammar (LTAG) with frame semantics. In *Proceedings of the 13th International Conference on Computational Semantics – Long Papers*, 79–90. Association for Computational Linguistics: Gothenburg, Sweden.

Jens Fleischhauer and Thomas Gamerschlag contributed the background on light verb constructions, while the LTAG analysis as well as the implementation of the theoretical analysis was undertaken by Laura Kallmeyer and Simon Petitjean. The frame representation was jointly developed by the four authors and is inspired by the frame analysis presented in Fleischhauer & Gamerschlag (2019).

(vii) Fleischhauer, Jens & Mozhgan Neisani. 2020. Adverbial and attributive modification of Persian separable light verb constructions. *Journal of Linguistics*: 1–41.

Mozhgan Neisani contributed the language data; the actual analysis was worked out by Jens Fleischhauer.

(viii) Fleischhauer, Jens. *accepted*. Simplex and complex predicates in Persian — An RRG analysis. Accepted for publication in: Van Valin, Robert D., Koen Van Hooste & Anja Latrouite. Proceedings volume from the 2015 RRG conference.

1 Introduction

A widely held assumption in linguistics is that the meaning of a complex expression is derived from the meaning of its parts. This is known as the principle of compositionality, one formulation of which is shown in (1):

(1) **Principle of compositionality:**
The meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined.

(Partee, 1984, 281)

The meaning of a complex expression like *red car* is derived from the meaning of *red* and the meaning of *car* and the way these two expressions are syntactically combined. The meaning of *red car* is 'car which has a red color'. The meaning of the complex expression *red car* is transparently distributed over its parts: *car* contributes the meaning 'car', i.e., the entity, which has color, and *red* contributes the color specification.

Two general questions with respect to complex expressions are: (i) How is the meaning of a complex expression distributed over its parts? And (ii), how are the parts of a complex expression put together? The studies reported on in this thesis investigate these questions with respect to two linguistic phenomena. The papers reviewed in chapter 2 deal with the composition of affectedness, and those reviewed in chapter 3 deal with the semantic as well as syntactic composition of light verb constructions. All eight papers reported on in this thesis address the question how different facets of the meaning of a predicative expression is compositionally derived by the morphosyntactic constructions of complex expressions (e.g. verbal prefixation in the Slavic languages, the combination of a verb with its object argument or the combination of a verb with a non-verbal element in a light verb construction). Thus, the studies reported on in the eight papers collected in this thesis are located at the interfaces between syntax and semantics as well as between morphology and semantics.

At this point, I would like to introduce the investigated phenomena in light of the two general questions mentioned above. A more detailed discussion of these two phenomena is presented in chapters 2 and 3, respectively.

Affectedness

Affectedness is a semantic property, which (very roughly) is concerned with the question of how specific a predicate is with respect to a change the referent of its theme argument is undergoing. Some predicates entail that their theme argument actually undergoes changes with respect to a certain property (e.g. volume, temperature, size, material integrity). The verb *destroy* entails a change with respect to the material integrity of

its theme argument; one cannot say *The troops destroyed the city but the city wasn't destroyed*. *Destroy* entail not only a change but also that a specific result state (usually called telos) is reached. Other verbs like *grow* entail that the theme argument changes but not that a specific result state is reached. One cannot say *The child has grown but it hasn't become taller* but one can say without contradiction that the child has grown but it has not become tall. Whereas *destroy* is telic – entailing the reaching of the telos – *grow* is atelic; as soon as the theme argument has increased in size, *grow* results in a true predication.

Some verbs are lexically unspecified for telicity, whether they result in a telic or atelic predication depends on, for example, other lexical material (e.g. properties of the verb's theme argument or verbal prefixes). This is an instance of what Pustejovsky (1998) calls 'strong lexical underspecification.' A class of verbs which is known for being lexically unspecified for telicity, is verbs of consumption and creation (also referred to as incremental theme verbs) like *eat, drink, write* and *build*. The examples in (2) show that *eat* is compatible with a telic (2a) as well as atelic (2b) interpretation (a diagnostic for telicity is the compatibility with time-span adverbials like *in ten minutes*).

(2) a. *Jonah ate the soup in ten minutes.*
b. *Jannes ate soup #in ten minutes.*

When it comes to a compositional analysis, the first question to ask is which components of the sentence are relevant in determining the predication's telicity? The second question is which semantic properties are actually relevant in determining telicity? In English, the referential properties of the theme argument directly determine the predication's telicity. *The soup* in (2a) refers to a specific amount of soup, whereas *soup* in (2b) does not. The Slavic languages Polish and Bulgarian, in contrast, require specific verbal prefixes to achieve a telic incremental theme predication. As the example in (3a) shows, the non-prefixed verb does not result in a telic interpretation, although the theme argument denotes a specific quantity of food. The prefixed verb, on the other hand, results in a telic interpretation (3b). In this particular example, the referential properties of the theme argument do not matter.

(3) Bulgarian (Czardybon & Fleischhauer, 2014, 390f.)
a. *Marija jade*$_{\text{IMPF}}$ *jabâlka-ta* (**za edin čas*).
Maria ate apple-DEF in one hour
'Maria ate/was eating (of) the apple.'
b. *Marija iz-jade*$_{\text{PF}}$ *jabâlka-*(*ta*) *za edin čas*.
Maria IZ-ate apple-(DEF) in one hour
'Maria ate an apple in one hour.'

Three of the papers summarized in chapter 2 (Czardybon & Fleischhauer, 2014; Fleischhauer & Czardybon, 2016; Fleischhauer & Gabrovska, 2019) investigate the compositional nature of telicity in Slavic – mainly Polish, Upper Silesian Polish and Bulgarian – incremental theme verbs meaning 'eat' and 'drink.' With respect to the sentence components relevant in determining telicity, it is argued in Czardybon & Fleischhauer (2014)

and Fleischhauer & Gabrovska (2019) that Bulgarian and Upper Silesian behave differently from other Slavic languages like, for example, Polish or Russian. Bulgarian and Upper Silesian behave like Polish and Russian in requiring a verbal prefix in order to achieve a telic incremental theme predication. In addition, the referential properties of the theme argument matter as well. Only the combination of a prefixed incremental theme verb with a theme argument denoting a specific quantity of food/liquid results in a telic interpretation, as evidenced by the data in (4).

(4) Bulgarian (Czardybon & Fleischhauer, 2014, 391)

a. #*Marija iz-jade*$_{\text{PF}}$ *jabălki* (**za edin čas*).
Marija IZ-ate apple.PL in one hour
'Maria ate [some plurality of the kind] apple.'

b. *Marija iz-jade*$_{\text{PF}}$ *jabălki-te* *za edin čas*.
Marija IZ-ate apple.PL-DEF in one hour
'Maria ate the apples in one hour.'

Regarding the second question – which semantic properties are relevant for determining telicity of incremental theme verbs – it is shown in Fleischhauer & Czardybon (2016) and Fleischhauer & Gabrovska (2019) that the meaning contributed by the verbal prefix is essential in determining telicity. A telic incremental theme predication only arises if the verbal prefix induces a lower bound on the theme argument's quantity. Only if the verbal prefix specifies a minimal quantity of food/liquid consumed within the event denoted by the verb does a telic incremental theme predication result. Crucially, a number of prefixed incremental theme verbs result in an atelic predication since the verbal prefix fails to induce a lower bound on the theme argument's quantity (a Polish example is shown in (5) below).

(5) *Po-piłem*$_{\text{PF}}$ *herbat-y* (**w minutę*).
PO-drank tea-GEN in minute
'I drank tea for a while.'
(Fleischhauer & Czardybon, 2016, 192)

Another class of verbs that are lexically unspecified for affectedness are verbs of contact by impact like German *schlagen* 'hit', *treten* 'kick' or *beißen* 'bite'. In German as well as a number of further Germanic but also Slavic languages, these verbs show a marking asymmetry with respect to their theme argument. An animate theme argument is realized as an NP-complement (6a), whereas an inanimate one is realized as a PP-complement (6b).

(6) a. *Das Mädchen schlug den Junge-n.*
DEF girl hit DEF.ACC boy-ACC
'The girl hit the boy.'

b. *Das Mädchen schlug* *(*auf*/*gegen*) *den Tisch.*
DEF girl hit on/against DEF.ACC table
'The girl hit (on/against) the table.' (Fleischhauer, 2018a, 567)

As soon as the inanimate theme argument is explicitly presented as being affected by the activity denoted by the verb, the inanimate theme argument is treated like an animate one and realized as an NP- rather than a PP-complement (7).

(7) *Das Mädchen schlug den Tisch in Stücke.*
DEF girl hit DEF.ACC table in pieces
'The girl hit the table into pieces.'
(Fleischhauer, 2018a, 567)

Arguably, the morphosyntactic coding asymmetry shown in (6) is based on affectedness. Like in the case of, for example, Germanic incremental theme verbs, affectedness is determined by the combination of the verb and its theme argument. In contrast to incremental theme verbs, it is not the theme argument's quantity which is relevant in determining affectedness, but its animacy. A detailed analysis of the factors relevant in determining the affectedness of verbs of contact by impact is given in Fleischhauer (2018a).

The four papers summarized in chapter 2 present a detailed discussion of the different semantic properties relevant in determining affectedness. A comparison of these properties is presented in section 2.3.

Light verb constructions

Light verb constructions (LVCs) are complex predicates consisting of a semantically reduced verb and a non-verbal element, which can, for example, be a nominal phrase (8a) or a prepositional phrase (8b).

(8) a. *give a wash, give a kiss, take a shower, take a bath*
b. *zur Verfügung stehen* 'be available' (lit. at.the disposal stand), *in Erfahrung bringen* 'glean' (lit. in experience bring/take)

A light verb construction predicates as a single unit, i.e., it functions as the sentence predicate. With respect to the semantic composition of light verb constructions, two particularly urgent questions are: (i) What is the semantic contribution of the LVC's individual components? And (ii), how do the individual components combine syntactically?

With respect to the first question, it is evident that the light verb is semantically reduced in comparison to its heavy verb use. The light verb *give*, for example, does not add a transfer of possession meaning to the LVC *give a kiss* (9a). The situation denoted by the LVC is not a literal transfer of a kiss (e.g. Butt & Geuder, 2001). As a heavy verb, on the other hand, *give* denotes a transfer of possession (9b).

(9) a. *Mary gave Peter a kiss* (# *and he is still in possession of it*).
b. *Mary gave Peter a book* (*and he is still in possession of it*).

The light verb does not provide the main predicational content rather this is contributed by the non-verbal element. It is the non-verbal element which determines the

denoted eventuality; *give a kiss* denotes a situation of kissing rather than one of giving. There is an asymmetry between the light verb and the non-verbal element: the light verb is the grammatical head of the light verb construction, whereas the non-verbal element is its semantic head.

That the main predicational content is contributed by the non-verbal element does not mean that the light verb does not have a semantic contribution. As the Persian examples in (10) show, the light verb contributes to the LVCs overall meaning. The choice of the light verb – *dâdan* 'give' vs. *kardan* 'do' – affects, for example, the intentionality of the denoted event; only *kardan* is compatible with an intentional production of sound.

(10) a. #*Bačče amdan sedâ dâd.*
child intentionally sound gave
'The child produced a sound intentionally.'
b. *Bačče amdan sedâ kard.*
child intentionally sound did
'The child produced a sound intentionally.'
(Fleischhauer & Neisani, 2020, 27f.)

The regular semantic contribution of the individual LVC components cannot be analyzed on the basis of isolated examples. Two of the papers summarized in 3 adopt the view that the best way of exploring the meaning of different components is by investigating individual families of light verb constructions. LVCs form a family if they are headed by the same light verb and show the same interpretational pattern. An example of a German LVC-family is shown in (11); the LVCs of this family can roughly be paraphrased as 'the subject referent undergoes the activity denoted by the PP-internal noun.' On the basis of such a regular interpretation pattern, the light verb's as well as the preposition's semantic contribution is identifiable (for a more detailed discussion of LVC-families, see Fleischhauer & Gamerschlag 2019; Fleischhauer et al. 2019, as well as chapter 3.1).

(11) *unter Anklage stehen* 'be charged with', *unter Verdacht stehen* 'be under suspicion', *unter Strafe stehen* 'be under penalty', *unter Bewachung stehen* 'be under guard/close watch', *unter Aufsicht stehen* 'be under supervision', *unter Beobachtung stehen* 'be under surveillance'

Besides identifying the individual components' meanings, a central question concerns the syntactic construction of the LVC. Two of the papers summarized in chapter 3 (Fleischhauer et al., 2019; Fleischhauer, accepted) present a syntactic analysis of light verb constructions. As clearly expressed in Fleischhauer (accepted), the non-verbal element of an LVC is analyzed as a complement of the light verb. This analysis is in line with the view that the light verb is the grammatical head of the light verb construction and is supported by data which show, for example, that under passivization the non-verbal element becomes the sentence's subject argument (12).

(12) a. *Maria gab ihm einen Kuss.*
'Maria gave him a kiss.'

b. *Ein Kuss wurde ihm* (*von Maria*) *gegeben.*
'A kiss was given to him (by Maria)'.

The four papers summarized in chapter 3 provide a detailed discussion of the semantic and grammatical properties of German as well as Persian light verb constructions. In particular, the papers present the first explicit modeling of the semantic composition of the lexical meaning of light verb constructions. Furthermore, the papers contribute to developing a definition of the notion of 'light verb construction' by highlighting semantic as well as grammatical differences between light verb constructions on the one hand and superficially similar looking construction types – e.g. pseudo-incorporation (Fleischhauer & Neisani, 2020; Fleischhauer, accepted), regular predicate-argument constructions (Fleischhauer, accepted), idioms (Fleischhauer, accepted) and aspectual auxiliary constructions (see chapter 3.1.3) – on the other.

Structure of the thesis

The structure of the thesis is as follows: Chapter 2 summarizes the four papers dealing with the compositional nature of affectedness, while the papers on the composition of light verb constructions are summarized in chapter 3. Each of the chapters starts with a general discussion of the theoretical background shared by all the papers summarized within the respective chapter. The individual papers are divided up into thematically coherent sections. Chapter 2 is organized in two sections: section 2.1 contains the papers dealing with incremental theme verbs; section 2.2 deals with verbs of contact by impact. Section 2.3 presents a brief comparison of how affectedness is compositionally determined in the two classes of verbs.

Chapter 3 is split into four sections, the first (3.1) dealing with the semantic composition of LVC-families. Section 3.2 investigates Persian LVCs from the perspective of attributive and adverbial modification, while section 3.3 provides a syntactic analysis of Persian light verb constructions based on the results of the foregoing section. Section 3.4, finally, puts the nominal element of LVCs into focus and presents evidence that the noun is not necessarily eventive. Both chapters end with a brief summary of the main results.

2 Affectedness

The four papers summarized in this chapter are concerned with the composition of affectedness. Affectedness, a central notion in the work on lexical semantics as well as on the syntax-semantics interface, is rarely precisely defined (see Beavers 2011 for a discussion of different notions of affectedness). In this chapter, I adopt Beavers' (2011; 2013) notion of affectedness. A central component in Beavers' explication of affectedness is the notion of a 'change.' A change is understood as "a transition of a theme along a scale" (Beavers, 2011, 350), whereby the scale measures the property with respect to which the theme argument's referent is changing (e.g. its size, temperature or volume). Affectedness is now understood as a relation between a predicate and its theme argument and refers to how specific a predicate is about the theme's change. Beavers distinguishes four grades of affectedness depending on how specific a predicate is about the theme argument's progress on the scale measuring the change. The hierarchy he proposes is shown in (1). At this point, I restrict myself to a brief and informal explication of the four grades of affectedness and will turn to a detailed discussion of Beavers' analysis in section 2.2.

(1) Affectedness hierarchy (Beavers, 2011, 359):
quantized change > non-quantized change > potential change > unspecified for change

The highest degree of affectedness is realized by predicates expressing quantized changes. In the case of a quantized change, the attainment of a specific result state – also called 'telos' – is entailed. A verb lexically encoding a quantized change is the change of state verb *break*. The verb entails that the referent of its theme argument is actually broken at the end of the event. Thus, it is not possible to say that someone broke something but it did not break (2). The specific result state (*being broken*) is lexically encoded in the verb.

(2) *John broke the window #but the window did not break.*

Non-quantized changes are encoded by verbs which express a change of state but do not entail the reaching of a specific result state. A class of verbs which shows this behavior is degree achievement predicates such as *cool, widen* and *lengthen* (the notion 'degree achievement' goes back to Dowty 1979). The verb *cool* only entails that its theme argument's referent becomes cooler but it does not entail that it becomes cool (3). Thus, the verb entails a change of state without indicating a telos to reach.

(3) *The soup has been cooling for an hour but it is still not cool.*

If a verb expresses a potential change, the verb is compatible with a change of state

predication but does not (necessarily) entail one. Verbs of contact by impact (e.g. *hit, kick, bite*) belong to this class. *Kick* does not entail any effect on its theme argument's referent but the verb is compatible with a change of state predication (e.g. *kick the door open*). I return to a detailed discussion of verbs of contact by impact in section 2.2.

Finally, verbs can be unspecified for changes, in which case they do not even provide a potential for a change of state entailment. Perception verbs like *see* and *hear* are unspecified for changes, which is evidenced by the fact that they cannot be used in resultative constructions (e.g. #*see the door open*).

Verbs can be specific with respect to the grade of affectedness they encode, for example *break* is a verb that lexically encodes quantized changes, whereas *see* is a verb which is lexically unspecified for change. But verbs can also be unspecified for the grade of affectedness. The work reported on in the following sections is concerned with the latter type of verbs. First, I review three papers (Czardybon & Fleischhauer, 2014; Fleischhauer & Czardybon, 2016; Fleischhauer & Gabrovska, 2019) dealing with incremental theme verbs (section 2.1). Incremental theme verbs like *eat* or *drink* express a change of the theme argument's referent. During the event denoted by the verb, the theme argument's referent is getting consumed and therefore decreases in quantity. The verbs are unspecified with respect to telicity. Telicity is a property of eventuality descriptions and falls under the broad notion of 'lexical aspect' (for an overview of this notion, see e.g. Filip 2012). The process of compositionally determining telicity is known as 'aspectual composition.' Whether an incremental theme predication expresses a quantized or non-quantized change depends on various factors. In some languages, telicity is dependent on properties of the theme argument (e.g. Germanic languages). In other languages, telicity is achieved by complex predicate formation (e.g. Slavic languages). But there are also languages combining both strategies (e.g. the Slavic language Bulgarian). The three papers reporting on aspectual composition address the question of which role verbal prefixes, i.e., complex predicate formation, play in aspectual composition within the Slavic language family. The focus is on the two languages Bulgarian and Polish. Bulgarian is particularly interesting as it combines two strategies – verb-centered complex predicate formation and a noun-centered strategy – in aspectual composition.

In section 2.2, I turn to the paper (Fleischhauer, 2018a), which discusses verbs that are unspecified with respect to the two lowest grades of affectedness. In German, as well as in a number of further languages (e.g. Swedish, Dutch, Polish), verbs of contact by impact (e.g. *schlagen* 'hit', *treten* 'kick' or *beißen* 'bite') either behave like predicates expressing potential changes or like predicates that are unspecified for change. The variable behavior depends on properties of the theme argument; more precisely, the grade of affectedness depends on the theme argument's animacy. Most importantly, this variable behavior manifests itself in a marking asymmetry of the theme argument. Animate arguments are realized as NP-complements (4a), whereas inanimate ones show up as PP-complements (4b).

(4) a. *Die Katze schlug den Hund.*
DEF cat hit DEF.ACC dog
'The cat hit the dog.'

b. *Die Katze schlug gegen den Ball.*
DEF cat hit against DEF.ACC ball
'The cat hit the ball.'

In section 2.3, finally, I turn to a comparison of the different properties relevant in determining affectedness.

2.1 Aspectual composition

Incremental theme verbs like German *essen* 'eat', *trinken* 'drink', *bauen* 'build', *lesen* 'read', *schreiben* 'write', *stricken* 'knit' and *mähen* 'mow' are aspectually underspecified (e.g. Filip 2012, 744, Filip & Rothstein 2005).[1] Depending on the morphosyntactic context, the verbs result in either a telic (5a) or an atelic interpretation (5b). The time-span adverbial *in zwei Minuten* 'in two minutes' in (5a) measures the time it takes till the event ends, i.e., the telos is reached. The event is over when the apple is eaten. The durative time adverbial *eine halbe Stunde lang* 'for half an hour' (5b) indicates the time duration for which a certain process (at least) holds. It does not measure out the event and is therefore compatible with atelic predicates.

(5) a. *Jannes hat den Apfel in nur zwei Minuten gegessen.*
'Jannes ate the apple is just two minutes.'
b. *Jonah hat eine halbe Stunde lang Suppe gegessen (, der Topf ist aber kaum leerer geworden).*
'Jonah ate soup for half an hour (, the pot barely became emptier).'

Verbs meaning 'eat' and 'drink', which are in the focus of the present analysis, are strictly incremental theme verbs, whereas verbs meaning, for example, 'read' are non-strictly incremental theme verbs. The difference between the two is that a specific object token can only be eaten once but a single piece of text can be read repeatedly (see Krifka 1989 for deeper a discussion of these notions). In the remainder, I use the term 'incremental theme verb' to refer to strictly incremental theme verbs only.

Essen 'eat' and *trinken* 'drink' express processes in which the agent (*Jannes* in (5a)) consumes the referent of the theme argument (the apple in the mentioned example). The meaning of incremental theme verbs is partially characterized by a homomorphic mapping between the part-whole structure of the verb's event argument and the part-whole structure of the incremental theme argument (for a formal definition of this homomorphism see e.g. Krifka 1989, 1998; Filip 1999). The idea behind this homomorphic mapping is nicely illustrated in the following quote from David Dowty:

> "[i]f I tell my son to mow the lawn (right now) and then look at the lawn an hour later, I will be able to conclude something about the "aspect" of the event of his mowing the lawn from the state of the lawn, viz., that the event is either not yet begun, partly done but not finished, or completed, according

[1] For an overview of the history of the debate see Verkuyl (1989, chap. 1) and Filip (2011, chap. 1).

to whether the grass on the lawn is all tall, partly short or all short."
(Dowty, 1991, 567)

The progressing of the event can directly be seen by looking at the incremental theme's referent. This correlates with the fact that incremental theme verbs license an inference from an adverbial quantity measuring the progression of the event to a nominal quantity measuring the degree to which the theme argument's referent is affected (6a). Verbs like *öffnen* 'open', which express non-incremental changes, do not license this inference pattern (6b). See Caudal & Nicolas (2005) for a further discussion of this issue.

(6) a. *Der Mann hat das Brot zur Hälfte gegessen.* ⇒ *Der Mann hat das halbe Brot gegessen.*
'The man ate the bread halfway' ⇒ 'The man ate half of the bread'
b. *Der Mann hat die Tür zur Hälfte geöffnet.* ⇏ *Der Mann hat die halbe Tür geöffnet.*
'The man opened the door halfway' ⇏ 'The man opened half of the door'

In the Germanic languages, the telicity of incremental theme predicates is dependent on the referential properties of the incremental theme argument. The relevant rule of aspectual composition is stated in (7).

(7) Rule of aspectual composition (based on Krifka 1989, 1998; Filip 1999, 2001)
An incremental theme verb combined with a quantized incremental theme argument yields a telic predication, whereas an incremental theme verb combined with a cumulative incremental theme argument yields an atelic predication.

The two essential notions in the definition are cumulativity and quantization; their definitions (based on Krifka 1991) are given in (8) and (9), respectively.

(8) Cumulativity: A predicate P shows cumulative reference, iff
$\forall x, y\ [P(x) \wedge P(y) \rightarrow P(x \oplus y)]$[2]

If a predicate showing cumulative reference applies to two distinct individuals, then it also applies to their sum. A bare plural (e.g. German *Äpfel* 'apples') refers cumulatively since if it applies to two distinct sets of apples, it also applies to the combination of the two sets of apples.

(9) Quantization: A predicate P shows quantized reference, iff
$\forall x, y\ [P(x) \wedge P(y) \rightarrow \neg\ y < x]$

A predicate is quantized if it applies to two distinct individuals of which neither can be a proper part of the other. A count noun like *Mensch* 'human' shows quantized reference since the noun applies to an individual but not to any proper part of it.

[2] '$<$' is the mereological part operator and '$\oplus$' is the mereological sum operator. For a formal definition of these operators, see e.g. Krifka (1998, 199) and Filip (1999, 49f.). A recent overview of mereology in formal semantics is found in Champollion & Krifka (2016).

Singular count nouns (e.g. *Apfel* 'apple' or *Buch* 'book') have quantized reference, whereas bare plurals and mass nouns (e.g. *Wasser* 'water' and *Suppe* 'soup') refer cumulatively. Thus, the example in (5a) is telic since the incremental theme argument *Apfel* 'apple' is a singular count noun. The atelic interpretation of (5b) is due to the fact that the incremental theme argument shows cumulative reference as it is a mass noun. Quantized nouns indicate a specific quantity of stuff, whereas cumulatively referring nouns do not. Thus, quantized nouns are able to specify an endpoint for an event, as they indicate the specific maximum quantity of food/liquid consumed within the respective event of eating/drinking.

Languages possess different morphosyntactic means for quantizing cumulative nouns, e.g. by the definite article (10a) of classifier constructions (10b). The classifier *einen Teller* 'a plate (of)' directly individuates a portion of soup. The definite article indicates the quantity of soup indirectly by contextually restricting the noun's reference.

(10) a. *Jonah aß die Suppe in (nur) zehn Minuten.*
'Jonah ate the soup in (just) ten minutes.'
b. *Jannes aß einen Teller Suppe in (nur) zehn Minuten.*
'Jannes ate a plate of soup in (just) ten minutes.'

Most Slavic languages – e.g. Polish, Russian and Czech – possess neither a grammaticalized definite nor an indefinite article. Hence, the languages do not have the same morphosyntactic means of quantizing cumulatively referring nouns that the Germanic languages have. In contrast to the Germanic languages, the Slavic ones have a grammaticalized opposition between perfective and imperfective aspect.[3] As the Polish data in (11) show, the combination of an imperfective incremental theme verb and a bare mass noun results in an atelic interpretation (11a), whereas a perfective verb combined with a bare mass nouns leads to a telic one (11b).[4] Crucially, there is no need for nominal determination to quantize the cumulatively referring mass nouns. Instead, the mass noun receives a quantized interpretation if it functions as the theme argument of a perfective incremental theme verb.

(11) Polish (Fleischhauer & Czardybon, 2016, 177)
a. *Jan pił*$_{\text{IMPF}}$ *wod-ę* (**w godzinę*).
Jan drank water-ACC in hour
'Jan drank/ was drinking water.'
b. *Jan wy-pił*$_{\text{PF}}$ *wod-ę w godzinę.*
Jan WY-drank water-ACC in hour
'Jan drank (all) the water in an hour.'

[3] Most Slavic verbs are either imperfective or perfective, but the languages also show a number of biaspectual verbs, which can receive both aspectual interpretations without any morphological marking.

[4] Slavic languages have a process called 'secondary imperfectivization' which creates an imperfective verb from a prefixed perfective one. For the moment, the discussion is restricted to imperfective simplex verbs since secondary imperfectives differ in their behavior from simplex verbs.

Germanic and Slavic languages use different strategies for realizing telic incremental theme predications. Filip (2008) classifies the Germanic languages as 'object-encoding,' whereas she calls the Slavic languages 'verb-encoding.'[5] In the Germanic languages, morphosyntactic marking within the direct object phrase is necessary to yield a telic interpretation. Marking on the verb, for example by derivational prefixes or particles, is not sufficient. The particle verb *aufessen* 'eat up' cannot combine with cumulatively referring nouns as the examples in (12) show. Germanic verb particles in the context of aspectual composition are discussed in more detail in Czardybon & Fleischhauer (2014) and Fleischhauer & Czardybon (2016).

(12) a. **Jannes hat Suppe aufgegessen.*
'Jannes ate up soup.'
b. *Jannes hat die Suppe aufgegessen.*
'Jannes ate up the soup.'

In the Slavic languages quantization of the incremental theme argument is not sufficient to yield a telic interpretation, as illustrated by the Polish example in (13a). The singular count noun *kanapka* 'sandwich' shows quantized reference but fails to induce a telic interpretation. As already discussed above, it seems that perfective aspect is necessary to achieve a telic interpretation (13b). I will argue below in 2.1.2 and 2.1.3 that it is not perfectivity, which leads to telicity, but the special lexical meaning contributed by the verbal prefix.

(13) a. *Ona jadła*$_{\text{IMPF}}$ *kanapk-ę* (**w godzinę*).
she eat.PST sandwich-ACC in hour
'She ate a/the sandwich.'
b. *Ona z-jadła*$_{\text{PF}}$ *kanapk-ę* *w godzinę.*
she Z-eat.PST sandwich-ACC in hour
'She ate a/the sandwich in an hour.'

Various authors (e.g. Abraham, 1997; Kabakčiev, 2000; Leiss, 2000; Borer, 2005; Heindl, 2017) argue that – at least in the context of aspectual composition – nominal determination and grammatical aspect serve the same semantic function.[6] Filip (1999; 2001) is explicit in arguing against such a view and her argumentation is taken up and supported by further evidence in Czardybon & Fleischhauer (2014).

2.1.1 Czardybon & Fleischhauer (2014)

The starting point for the analysis presented in Czardybon & Fleischhauer (2014) is the (above mentioned) claim that perfective aspect and the definite article express the

[5] It seems that not all languages fit in the pattern of 'object-' vs. 'verb-encoding'. Turkish, for example, does not have a morphosyntactic strategy which results in a telic interpretation of incremental theme verbs. Rather, the aspectual interpretation of incremental theme verbs is context-dependent (Aksan, 2007). For further cross-linguistic variance in aspectual composition, see the discussion in Latrouite & Van Valin (2014).

[6] For a critical discussion of Heindl (2017), see Fleischhauer (2019).

same semantic function. The argumentation against this equation is based on language data from the two Slavic varieties Bulgarian and Upper Silesian, the latter of which is a dialect of Polish. These two varieties are interesting since they have – in addition to the Slavic aspectual system – a grammaticalized definite article. Thus, if the definite article and perfective aspect express the same semantic function, it would be expected that the use of either perfective aspect or the definite article should be sufficient to yield a telic incremental predication in Bulgarian and Upper Silesian. In this case, the simultaneous realization of both – perfective aspect and the definite article – is redundant.

In Upper Silesian, imperfective incremental theme verbs result in an atelic interpretation, irrespective of whether the incremental theme argument is indefinite (14a) or explicitly marked as being definite (14b).

(14) Upper Silesian (Czardybon & Fleischhauer, 2014, 388)

a. *Łon jod*$_{\text{IMPF}}$ *jabk-o* (**za godzina*).
he eat.PST apple-ACC.SG in hour
'He ate/was eating (of) an apple.'

b. *Łon jod*$_{\text{IMPF}}$ *te jabk-o* (**za godzina*).
he eat.PST DEF apple-ACC.SG in hour
'He ate/was eating (of) the apple.'

The combination of a singular count noun and a perfective incremental theme verb results in a telic interpretation, irrespective of the presence (15a) or absence of nominal determination (15b). With respect to singular count nouns, Upper Silesian does not differ from Polish (cf. (13)).

(15) a. *Łon z-jod*$_{\text{PF}}$ *te jabk-o za godzina.*
he Z-eat.PST DEF apple-ACC.SG in hour
'He ate the apple in an hour.'

b. *Łon z-jod*$_{\text{PF}}$ *jabk-o za godzina.*
he Z-eat.PST apple-ACC.SG in hour
'He ate an apple in an hour.'

(Czardybon & Fleischhauer, 2014, 389)

A crucial difference between Upper Silesian and Polish is found with respect to cumulatively referring nouns. In Upper Silesian, bare plurals and mass nouns receive a kind-interpretation if used as the theme argument of a perfective incremental theme verb (16a). In combination with a bare mass or plural noun, the incremental theme predication is atelic. For a telic interpretation, cumulatively referring nouns require explicit quantization by, for example, the definite article (16b). Only inherently quantized nouns, i.e., singular count nouns, can be used bare as the theme argument of a perfective incremental theme verb.

(16) a. *Łon z-jod*$_{\text{PF}}$ *jabk-a.*
he eat.PST apple-ACC.PL
'He ate [some plurality of the kind] apple.'

b. *Łon z-jod*$_{\text{PF}}$ *te jabk-a za godzina.*
he eat.PST DEF apple-ACC.PL in hour
'He ate the apples in an hour.'

(Czardybon & Fleischhauer, 2014, 389)

Upper Silesian – as well as Bulgarian (Czardybon & Fleischhauer, 2014, 390f.) – shows a combination of the 'verb-encoding' and the 'object-encoding' strategy. Neither perfective aspect nor the definite article is sufficient for achieving a telic incremental theme predication. The definite article is required to quantize inherently non-quantized arguments, whereas aspectual marking is needed to enforce a telic interpretation of incremental theme verbs combined with quantized theme arguments. This shows that perfective aspect and the definite article have different semantic functions. The definite article affects the interpretation of the noun; following Löbner (1985, 2011), a definite noun has a – probably contextually determined – unique referent. Perfective aspect, on the other hand, restricts the denotation of a verb to total events (Filip, 1999, 2005). Total events are atomic and require a property with respect to which they are evaluated as being total. This can be illustrated by a brief discussion of the Polish verbal prefix *po-*. A semantic representation of the prefix (based on Filip's 2000 analysis of the corresponding Russian prefix) is shown in (17). Following Filip, Slavic verbal prefixes are analyzed as vague measure functions. A (vague) measure function maps an argument – either an individual or an event – onto a scale and returns the argument's degree on that scale. The Polish prefix *po-* is analyzed as a vague measure function $\tau(\text{e})$, which maps an event e onto a scale measuring its run time. Besides the measure function, the prefix also induces a comparison degree s_c and specifies that e's degree is less than the contextually determined comparison degree.

(17) $[\![\text{po-}]\!] = \lambda\text{P}\lambda\text{e}[\text{P(e)} \wedge \tau(\text{e}) \leq \text{s}_c]$

(Fleischhauer & Czardybon, 2016, 194)

The measure function introduces the relevant property with respect to which an event is evaluated as being complete. A verb prefixed by *po-* is complete if the event fulfills the condition induced by the prefix, i.e., if its run time does not exceed s_c. This results in the interpretation that the respective event only lasts for a short while (18).

(18) *Po-piłem*$_{\text{PF}}$ *herbat-y.*
PO-drank tea-GEN
'I drank tea for a while.'

The study reported on in Fleischhauer & Czardybon (2016) addresses the question of which role the lexical meaning of a verbal prefix plays in aspectual composition.

2.1.2 Fleischhauer & Czardybon (2016)

As mentioned above, Slavic languages possess a grammaticalized opposition between perfective and imperfective aspect. Simplex verbs can either be perfective or imperfective (19). But more frequently, perfective verbs are created from imperfective ones by the addition of verbal prefixes (20).

(19) a. *pisat'*$_{\text{IMPF}}$ ‘write’ b. *izuçit'*$_{\text{PF}}$ ‘learn, study’ [Russian]

(20) a. *delat'*$_{\text{IMPF}}$ do ‘do’ b. *s-delat'*$_{\text{PF}}$ S-do ‘do’ [Russian]

The Slavic verbal prefixes are derivational rather than inflectional affixes (e.g. Isačenko, 1962; Filip, 1999, 2000). Such a view is, for example, supported by the fact that verbal prefixes change the meaning of the stem as the Polish examples in (21) show.

(21) a. *pisać*$_{\text{IMPF}}$ ‘write’
b. *pod-pisać*$_{\text{PF}}$ ‘sign’
c. *po-pisać*$_{\text{PF}}$ ‘write for a while’
d. *na-pisać*$_{\text{PF}}$ ‘write completely’ [Polish]

A further criterion speaking in favor of an analysis in terms of derivation is that verbal prefixes can be iterated. This is very productive in Bulgarian; the example in (22) shows the iteration of five verbal prefixes. Furthermore, the example shows that verbal prefixes attach to stems which are already perfective. The prefix *iz-* in (22g) attaches to a complex and already perfective stem. One cannot say that the function of *iz-* is to create a perfective verb rather its function consists in creating a verb that has a specific lexical meaning. Although the Slavic verb prefixes are similar to the verbal prefixes/particles found in the Germanic languages with respect to their derivational nature, they show a remarkable difference in that in the Slavic languages prefixation results in the derivation of a perfective verbal lexeme, whereas verbal prefixes/particles do not have a perfectivizing function in the Germanic languages (e.g. Brinton, 1985; Czardybon & Fleischhauer, 2014). To be precise, Slavic verbal prefixes are derivational affixes which only have a perfectivizing function if the base verb is imperfective (for a detailed discussion of this issue, see Filip 1999).

(22) Bulgarian (Istratkova, 2004, 309)
a. *dam*$_{\text{PF}}$ ‘give’
b. *po-dam*$_{\text{PF}}$ ‘pass’
c. *po-raz-dam*$_{\text{PF}}$ ‘distribute a little’
d. *po-pre-raz-dam*$_{\text{PF}}$ ‘redistribute a little’
e. *iz-po-raz-dam*$_{\text{PF}}$ ‘distribute completely little by little’
f. *iz-po-na-raz-dam*$_{\text{PF}}$ ‘distribute completely many things’
g. *iz-po-na-pre-raz-dam*$_{\text{PF}}$ ‘redistribute completely little by little’

As discussed above, a telic incremental theme predication only arises with perfective verbs. Since simplex incremental theme verbs are imperfective, perfective incremental theme verbs always bear a verbal prefix. This leads to the question of which role the

lexical meaning of the verbal prefix plays in aspectual composition. At the end of section 2.1.1, I already introduced the analysis of Slavic verbal prefixes as encoding vague measure functions. Thus, the crucial question is whether perfective aspect or the measure function introduced by the verbal prefix is relevant in determining telicity. If it is perfective aspect, a telic incremental theme predication should arise irrespective of the lexical content of the verbal prefix. If, on the other hand, the lexical content, i.e., the measure function, is crucial in determining telicity, there should be perfective incremental theme verbs which do not yield a telic interpretation. This is what we indeed find, as shown below.

The two Polish verbs *jeść* 'eat' and *pić* 'drink' are compatible with the following prefixes: *po-*, *wy-*, *z-*/*s-*, *nad-*, *do-* and *na-*.[7] *Wy-* is restricted to the verb *pić*, while *z-* is only used with *jeść*. These two prefixes indicate that the referent of the incremental theme argument has been consumed completely. Thus, it is no surprise that *wy-* and *z-* prefixation results in telic incremental theme predications, as illustrated for *wypić* 'drink up' in (23).

(23) *Wy-piłem*$_{\text{PF}}$ *wod-ę* *w minut-ę*.
WY-drank water-ACC in minute
'I drank up (all) the water in a minute.'
(Fleischhauer & Czardybon, 2016, 191)

The measure functions map the incremental theme argument onto a scale measuring the quantity of the argument's referent affected by the denoted process. The returned degree equals the maximal degree on the scale which results in the interpretation that the maximum quantity of, for example, wine has been consumed.

There exist two prefixes which result in perfective but atelic incremental theme predications. These are *po-* (24a) and *nad-* (24b). The two examples show that perfectivity is not sufficient to yield a telic incremental theme predication. Thus, it is relevant to analyze the semantic contribution of the verbal prefix in detail. Starting with *po-*, which has already been mentioned above, one can observe that it does not induce a measure on the incremental theme argument. Rather, *po-* induces a measure on the verb's event argument, i.e., the event's run time.

(24) a. *Po-piłem*$_{\text{PF}}$ *herbat-y* (**w minutę*).
PO-drank tea-GEN in minute
'I drank tea for a while.'
b. *Nad-piłem*$_{\text{PF}}$ *wino* (**w minutę*).
NAD-drank wine in minute
'I drank a bit of the wine.'
(Fleischhauer & Czardybon, 2016, 192, 196)

A first observation is that only prefixed incremental theme verbs in which the prefix induces a measure on the incremental theme argument result in a telic predication. The

[7] The prefix *na-* is not discussed in Fleischhauer & Czardybon (2016) but only in Fleischhauer & Gabrovska (2019).

case of *nadpić* 'drink a bit' adds a second piece of data, which leads to a further refinement of the rule of aspectual composition. *Nad-* induces a measure on the incremental theme argument but differs from *wy-/z-* in saying that just a small amount of liquid/food has been consumed. The prefixes resulting in a telic interpretation come with a standard value that has to be exceeded during the event denoted by the verb. *Nad-*, on the other hand, comes with a standard value which must not be exceeded. This fits into Hay et al.'s (1999) analysis of the role degree adverbials such as English *slightly* and *significantly* play in determining the telicity of degree achievement predicates. Degree achievement predicates like English *widen, broaden* or *lengthen* show variable telicity. Hay et al. demonstrate that adding *significantly* to a degree achievement predication results in an unambiguous telic interpretation (25a), whereas *slightly* leads to a strictly atelic one (25b). In the case of a telic interpretation, the perfect form of the verb does not license an entailment of the progressive. If something is broadening significantly, it is not the case that any arbitrary change already counts as a significant broadening. An atelic predicate, in contrast, licenses an entailment from the perfect to the progressive since as soon as something is broadening, one is justified in saying that it has already broadened slightly. This phenomenon is known as the 'imperfective paradox' (Bennett & Partee, 1972).

(25) a. *The independent counsel is broadening the investigation significantly.* ⇏ *The independent counsel broadened the investigation significantly.*
b. *The independent counsel is broadening the investigation slightly.* ⇒ *The independent counsel broadened the investigation slightly.*
(Hay et al., 1999, 133)

Significantly represents a monotone increasing degree expression, which introduces a lower bound that has to be reached to yield a true predication. *Slightly*, on the other hand, represents a monotone decreasing degree expression, which introduces an upper bound that must not be reached. Hay et al. (1999) claim that only monotone increasing degree expressions induce telicity, which perfectly fits the Polish data. While *wy-/z-* and *do-* are monotone increasing, i.e., they introduce a lower bound, *nad-* is monotone decreasing and therefore fails to induce a telic incremental predication. This allows the rule of aspectual composition to be reformulated as stated in (26).

(26) Revised rule of aspectual composition
In the case of a perfective verb with a quantized incremental theme argument and a monotone increasing measure on the quantity of the incremental theme argument, the incremental theme predication is telic.
(Fleischhauer & Czardybon, 2016, 198)

The rule still refers to perfective aspect, resulting in the question of whether perfectivity is necessary to achieve telicity. This can be tested by looking at secondary imperfectives. An example of the secondary imperfective of *jeść* 'eat' is shown in (27). A stem alternation occurs in the formation of this form but more crucial for the current analysis is that the secondary imperfective is formed from the prefixed verb *zjeść* 'eat up'.

The secondary imperfective receives a habitual interpretation meaning 'used to eat up'. Most importantly, the sentence in (27) denotes an iteration of telic microevents, each single microevent of eating up the soup is telic. Thus, we have an imperfective but telic incremental theme predication.

(27) *Jan z-jada-ł zupę w godzinę.*
Jan Z-eat.IMPF-PST soup.ACC in hour
'Jan used to eat the soup in an hour.'
(Fleischhauer & Czardybon, 2016, 198)

As the example shows, telicity is not dependent on grammatical aspect but only on the meaning contributed by the verbal prefix. This allows the rule of aspectual composition to be revised as presented in (28):

(28) Revised rule of aspectual composition (final version)
A telic incremental theme predication arises if a verbal prefix imposes a monotone increasing measure on the quantity of the incremental theme argument. Otherwise the incremental theme predication is atelic.
(Fleischhauer & Czardybon, 2016, 199)

The analysis presented in Fleischhauer & Czardybon (2016) is only based on Polish data and therefore cannot claim to hold for other Slavic languages as well. Slavic languages show considerable variance with regard to verbal prefixes but also with respect to grammatical aspect. Filip (2004, 2005), for example, mentions that in Russian certain plain imperfectives license telic interpretations (29). In Polish, in contrast, plain imperfective incremental theme verbs never result in a telic interpretation (13a).

(29) *V den Ivan pet*$_{\text{IMPF}}$ *butylk-u vodk-a.*
in day Ivan drinks bottle-ACC vodka-GEN
'Ivan drinks (is able to drink) a bottle of vodka in a day.'
(Filip, 2004, 105)

Slavic languages also show differences in the semantic interpretation of the verbal prefixes. Following Filip (2003), the Russian prefixed verb *po-pit'* means 'drink a little bit', whereas the Polish correspondent means 'drink for a short while'. Furthermore, she argues that "[a] verb with the measure prefix *po-* is necessarily telic" (Filip, 2003, 92). This again is in sharp contrast to Polish, where the verb *popić* is atelic, as shown above. Thus, one needs to be cautious in making generalizations over all Slavic languages as the languages show considerable variance with respect to the encoding and composition of telicity. Therefore it is important to make an actual comparison of Polish with other Slavic data to see whether more languages behave like Polish. This, in fact, is the aim of the study reported on in Fleischhauer & Gabrovska (2019), which compares aspectual composition in the West Slavic language Polish with aspectual composition in the South Slavic language Bulgarian.

2.1.3 Fleischhauer & Gabrovska (2019)

With respect to the nominal as well as the verbal domain, Bulgarian shows a number of differences to Polish. First, Bulgarian possesses a grammaticalized definite article (see Czardybon 2017 for a comparative study of the encoding of definiteness in the Slavic languages). As already discussed in section 2.1.1, the combination of a perfective incremental theme verb and an incremental theme argument which is either a plural count noun or a mass noun only results in a telic interpretation if the nominal argument is explicitly quantized (30a). An imperfective incremental theme verb combined with a quantized argument results in an atelic interpretation (30b). The combination of a perfective verb and a non-quantized argument results in a kind-reading of the noun; the predication is atelic (30c).

(30) a. *Mariya iz-yade*$_{\text{PF}}$ *yabălki-ta* *za edin čas*.
Maria IZ-ate.AOR apple.PL-DEF in one hour
'Maria ate the apples in one hour.'

b. *Mariya yade*$_{\text{IMPF}}$ *vchera* *yabălka-ta* (**za edin čas*).
Maria ate.AOR yesterday apple-DEF in one hour
'Maria ate the apple yesterday.'

c. *Mariya iz-yade*$_{\text{PF}}$ *yabălki*.
Maria IZ-ate.AOR apple.PL
'Maria ate [some plurality of the kind] apple.'[8]

(Fleischhauer & Gabrovska, 2019, 113f.)

A further difference between the two languages is found in the Bulgarian tense system. Whereas Polish only has a single past tense, Bulgarian has two: one form called 'aorist,' the other called 'imperfect.' The notions 'aorist' and 'imperfect' are often used for fused tense-aspect markers: the aorist expressing a perfective past, the imperfect an imperfective one (e.g. Comrie, 1976, 23).[9]

The two relevant questions discussed in the paper are: First, is perfective aspect necessary to achieve a telic incremental theme predication? Second, does the distinction between aorist and imperfect play a role in the process of aspectual composition?

Starting with the first question, it can be shown that aspectual composition in Bulgarian proceeds as in Polish. A telic incremental theme predication only arises with verbal prefixes inducing a monotone increasing measure on the quantity of the incremental theme argument. The Bulgarian prefix *iz-* (30a) is comparable to the Polish prefixes *wy-/z-*, which express the total consumption of the incremental theme argument's referent.

The prefix *ot-* also derives perfective verbs, but as (31) shows, the resulting predication is atelic. The language data are not clear with respect to the interpretation of *otpix*. In some contexts it is interpreted as meaning 'drink for a short while', whereas in others it means 'drink a small amount of liquid'. In its first interpretation ('drink for a short

[8] Bulgarian native speakers vary on the acceptance of the example.

[9] A fusion of tense and aspect marking is found, for example, in the Romance language French (e.g. Garey, 1957) as well as in the Northeast Caucasian language Lezgian (Haspelmath, 1993, 1994).

while'), atelicity arises since the prefix does not induce a measure on the incremental theme argument but on the event argument. In the second interpretation ('drink a small amount of liquid'), the prefix induces a measure on the incremental theme argument's quantity but only a monotone decreasing one.

(31) *Az sášto ot-pix*$_{\text{PF}}$ **za dve minuti*.
I also OT-drink.AOR.1SG in two minutes
'I also took a big sip and swallowed it quickly to not start choking.'
(Fleischhauer & Gabrovska, 2019, 117)

That perfective aspect is not necessary to achieve a telic incremental theme predication is demonstrated by the example in (32). The secondary imperfective *iz-yazhdaše* refers to an iteration of telic micro-events.

(32) *Do skoro iz-yazhdaše burkanche-to za po-malko ot 10 minuti*.
to soon IZ-eat.IMPF.IPFV jar.DIM-DEF for less from 10 minutes
'Until recently s/he was eating up the jar in less than 10 minutes.'
(Fleischhauer & Gabrovska, 2019, 121)

Thus, the Bulgarian data support the final rule of aspectual composition proposed for Polish (28).

Let us now turn to the second question: Does the distinction between the aorist and imperfect past affect aspectual composition? In her discussion of the Bulgarian tense system, Kuteva (1995) shows that both past tense forms are compatible with perfective as well as imperfective verbs. The combination of aorist with perfective aspect (30a) as well as imperfective aspect (30b) has already been shown above. Example (33) shows a perfective verb used in the imperfect past tense.

(33) *Štom iz-yadeše*$_{\text{PF}}$ *portsiya-ta za 10 minuti, poiskvaše vtora*.
when IZ-eat.IPFV portion-DEF in 10 minutes want second
'Everytime when he finished his portion in 10 minutes, he wanted a second one.'
(Fleischhauer & Gabrovska, 2019, 121)

Thus, there is no restriction on the combination of (past) tense and grammatical aspect. This speaks against the view that Bulgarian possesses a fused tense-aspect category. Whatever the traditional label 'aorist' refers to in Bulgarian grammar, it is not a perfective past tense. Similarly, the label 'imperfect' does not designate an imperfective past tense.[10]

Coming back to aspectual composition, the example in (33) shows that imperfect past tense does not block telicity. The verb in the example is prefixed by *iz-*, which, as mentioned above, induces a monotone increasing measure on the quantity of the incremental theme argument. The telic interpretation of (33) is therefore expected. It is fair to claim that the distinction between aorist and imperfect does not affect aspectual composition

[10] It seems that the term 'aorist' is not used in a cross-linguistically consistent way. In Turkish grammar, a morpheme labeled 'aorist' expresses habituality, whereas the aorist in Ancient Greek expresses perfective aspect but not past tense (e.g. Friedrich 1974; Dahl 1985; Bary 2009).

at all. Thus, the distinction between the two past tenses is related neither to a distinction between grammatical aspect, nor to a distinction relating to telicity. This results in the question of what the rationale for the distinction between the two Bulgarian past tenses is. Fleischhauer & Gabrovska (2019, 120) only present some brief speculation on this issue, arguing that the Bulgarian difference between aorist and imperfect might be related to Depraeter's (1995) notion of 'boundedness.' It is not totally clear how boundedness can be demarcated from telicity and perfectivity, but it relates to the temporal delimitation of events. An event is (temporally) bounded if it is temporally delimited and it is unbounded otherwise. In this view, aorist is a past tense used for temporally bounded events (or series of events) in the past, whereas imperfect is used for temporally unbounded ones. Evidence for this analysis is gained from the fact that the imperfective imperfect denotes repeated events in the past, whereas the perfective imperfect denotes "unrestrictedly repeated activities each of which has been completed" (Kuteva, 1995, 204). The imperfect aorist, on the other hand, is used to denote a limited temporal duration or iteration in the past (Kuteva, 1995, 206).

As the above discussion has revealed, past events are characterized by at least three different features in Bulgarian: temporal boundedness (expressed by the choice of past tense form), telicity and perfectivity. The notion of temporal boundedness is – so far – not sufficiently worked out and requires in addition to a formal explication also more substantial work with respect to its manifestation in the Bulgarian verbal system. This will be the subject of future work.

To summarize the brief cross-linguistic comparison of aspectual composition, it has been demonstrated that aspectual composition in Bulgarian only differs in one feature from Polish: non-inherently quantized incremental theme arguments require explicit quantization. In all other respects, the two languages behave the same. In particular, both languages require a verbal prefix inducing a monotone increasing measure on the quantity of the theme argument to yield a telic incremental theme predication. So far, it is an open question why Russian seems to behave differently from Polish and Bulgarian. In addition, it is an open question how the other Slavic languages (e.g. Upper Sorbian, Czech or Serbo-Croatian) behave with regard to aspectual composition. A more detailed comparison of the different Slavic varieties is a task for future work.

Having focused on the two highest degrees of affectedness, I now turn to a discussion of the compositional nature of the two lower grades of affectedness in the next section.

2.2 Affectedness and animacy (Fleischhauer 2018)

In German, as well as in a number of further Germanic languages (e.g. Danish, Dutch, Swedish), verbs of contact by impact show an asymmetry in the morphosyntactic realization of their undergoer argument.[11] A German example using the verb *beißen* 'bite' is

[11] de Swart (2014) mentions Norwegian as a further Germanic language; Fleischhauer (2018a, 584f.) shows that an argument realization asymmetry is also found in Slavic languages (e.g. Polish). For a cross-linguistically survey of the argument realization pattern of verbs of contact by impact, see Levin (2015). Levin does not relate the described argument realization asymmetries to affectedness.

given in (34). The animate undergoer argument is realized as an NP-complement (34a), while the inanimate undergoer is realized as a prepositional complement (34b).

(34) a. *Der Hund beißt den Briefträger.*
'The dog bit the postman.'
b. *Der Hund beißt *den Knochen/auf den Knochen.*
'The dog bit the bone.'

This marking asymmetry is restricted to a small set of verbs of contact by impact, which in German are: *schlagen/hauen* 'hit', *treten* 'kick', *kneifen* 'pinch', *beißen* 'bite' and *kratzen* 'scratch/claw'. Regarding these verbs, Levin (1993, 150) writes: "These verbs describe moving one entity in order to bring it into contact with another entity, but they do not necessarily entail that this contact has any effect on the second entity." As the English examples in (35) show, a possible effect can be negated without contradiction.[12] This indicates that the verbs do not lexically encode an effect on the theme argument.

(35) a. *Maria kicked John, but nothing is different about him.*
b. *Maria kicked the table, but nothing is different about it.*
c. #*Maria kicked the table, but did not even touch it.*

Adding either a resultative construction (36a) or a resultative prefix (36b) has an impact on argument realization. In such a case, the inanimate undergoer argument must be realized as an NP- rather than as a PP-complement.

(36) a. *Het meisje stampte de deur kapot.* [Dutch]
DEF girl kicked DEF door broken
'The girl kicked the door into pieces.'
(Lundquist & Ramchand, 2012, 228)
b. *Der Hund zer-beißt den Knochen/*auf den Knochen.*
'The dog bit the bone into pieces.'

Lundquist & Ramchand (2012) argue that the marking asymmetry is conditioned by affectedness. According to their view, inanimate undergoer arguments are not affected, whereas animate ones are affected. The authors define affectedness as follows:

(37) Affectedness (Lundquist & Ramchand, 2012, 233):
Any DP that holds a property that is continuously changing, or that is the holder of a property that is a result of a change is defined as 'affected'. The property in question can be in the domain of 'quality' or 'location' depending on the particular lexical encyclopedic properties of the verb.

A crucial component of the definition is the notion of 'change' as the authors say that an entity is only affected if one of its properties is continuously changing or is the result of a change. Unfortunately, Lundquist and Ramchand do not explicate how an animate

[12] The '*nothing is different about X*'-test is taken from Beavers & Koontz-Garboden (2012, 337) and is intended to be a general negation of result.

undergoer changes as a result of being hit, kicked or bitten. Furthermore, the authors do not provide any criteria to test for different degrees of affectedness.

Since resultative constructions – as shown in (36a) and (36b) – have an effect on argument realization, it can reasonably be assumed that affectedness is the relevant property conditioning the marking asymmetry. A formally worked out definition of affectedness is presented by John Beavers (Beavers, 2011). Beavers' explication of the notion of affectedness starts – similarly to Lundquist and Ramchand's – with the notion of change. Change is understood as "a transition of a theme on a scale" (Beavers, 2011, 350); a scale is a linearly ordered set of degrees and represents a gradable property of the theme argument's referent. Beavers distinguishes four degrees of affectedness corresponding to how "specific a predicate is about the theme's progress on the scale" (Beavers, 2011, 357).

(38) Affectedness hierarchy (Beavers, 2011, 359):
quantized change > non-quantized change > potential change > unspecified for change

The more specific the predicate is with respect to the theme's progression along the scale, the higher its degree of affectedness is. The four grades of affectedness have already been introduced above, therefore I only concentrate on the two lowest degrees of affectedness, which are relevant for the current discussion. A criterion distinguishing between potential changes on the one hand and quantized/non-quantized changes on the other hand is the actual entailment of a change. As already discussed above, verbs of contact by impact license negating the entailment of an actual change (35b), indicating that these verbs express neither quantized nor non-quantized changes. Verbs expressing potential changes differ from verbs which are unspecified for change with respect to the *happen/did to* test. *Destroy, eat* (39a) (verbs expressing non-/quantized changes) and *hit* (39b) pass the test; they can be realized in a *happen/did to* frame. Verbs such as *follow* fail the test and are classified as being unspecified for change.

(39) a. *What happened to the cake is that John destroyed/ate it.*
b. *What happened to the car is John hit it.*
c. #*What happened to the star is they followed it* (*out of Bethlehem*).
(Beavers, 2011, 340)

Using the above mentioned criteria, it can be demonstrated that verbs of contact by impact express potential changes with animate undergoer arguments (40a) but are unspecified for change if the undergoer is inanimate (40b).

(40) a. *Was* (*mit*) *Karl passierte ist, dass Maria ihn schlug.*
what with Karl happened is that Maria him hit
'What happened to Karl is that Maria hit him.'
b. #*Was* (*mit*) *dem Tisch passierte ist, dass Maria ihn schlug.*
what with DEF.DAT table happened is that Maria him hit
'What happened to the table is that Maria hit it.'
(Fleischhauer, 2018a, 580)

The degree of affectedness increases in the context of an explicit result predication (41).

(41) *Was (mit) dem Tisch passierte ist, dass Maria ihn zer-schlug.*
what with DEF.DAT table happened is that Maria him ZER-hit
'What happened to the table is that Maria hit it into pieces.'
(Fleischhauer, 2018a, 581)

The semantic representations for the four different grades of affectedness are shown below (42). In the definitions, e represents the event denoted by the predicate ϕ. s represents the scale along which the theme x is changing. g is a degree on s and represents the goal of the change. In the case of a quantized change, there is a state resulting from the event and at which g holds of x. The different degrees of affectedness are derived by existential generalization. Beavers (2011, 358) notes: "Non-quantized change is an existential generalization over the goal of a quantized change, potential for change is an existential generalization of the θ-relation between the theme, scale, and event, and being unspecified for change is an existential generalization over the thematic role of the theme."

(42) a. x undergoes a quantized change iff $\phi \rightarrow \exists e \exists s[\text{result'}(x, s, g_\phi, e)]$
b. x undergoes a non-quantized change iff $\phi \rightarrow \exists e \exists s \exists g[\text{result'}(x, s, g, e)]$
c. x has potential for change iff $\phi \rightarrow \exists e \exists s \exists \theta[\theta(x, s, e)]$
d. x is unspecified for change iff $\phi \rightarrow \exists e \exists \theta'[\theta'(x, e)]$
(Beavers, 2011, 358)

Potential for change is characterized by Beavers as a predicate, which is associated with a scale but which does not necessarily entail an actual change. That a predicate is associated with a scale means that "there is some specific set of possible changes that could occur due to the type of action the predicate describes" (Beavers, 2013, 689). Having potential for change means that a suitable scale can be inferred.

Why are inanimate undergoer arguments treated as being less affected by activities like kicking, hitting or biting than animate ones? A crucial difference between animate and inanimate beings is that both can be physically affected, whereas only animate ones can be psychologically/emotionally affected (Malchukov, 2008; Lundquist & Ramchand, 2012; de Hoop, 2015). Verbs of contact by impact do not entail physical changes, rather such changes are only entailed in the context of resultative predications. Animate beings license the inference of a non-physical change, i.e., they can be emotionally or psychologically affected without being physically affected. Inanimate beings do not license such an inference and therefore do not license the inference of a suitable scalar property. In this case, the only solution consists in reducing the degree of affectedness by "existential generalization over the thematic role of the theme" (Beavers, 2011, 358). The relations between the different dimensions of affectedness – physical and psychological – are summarized in table 2.1.

The marking asymmetry observed in German as well as a number of further languages is conditioned by an interaction of affectedness and animacy. Inanimate beings are less affected by activities like kicking, hitting or biting as they cannot undergo a psychological

Dimensions of affectedness	**Animacy**	**Example**
physical	animate & inanimate	animate: *being hurt, being killed* inanimate: *being broken, being bent*
psychological	animate	*being frightened, being offended*

Table 2.1: Dimensions of affectedness and animacy (Fleischhauer, 2018a, 585).

change of state. Thus, the difference in affectedness – and therefore also the marking asymmetry – is rooted in an ontological difference between animate and inanimate beings.

2.3 Properties determining affectedness

The foregoing articles discussed the composition of affectedness for two different classes of verbs. It turned out that – at least in the Germanic languages – properties of the theme argument are crucial for determining the predicate's grade of affectedness. But as the discussion also revealed, it is not the theme argument alone which determines affectedness. Especially in the Slavic languages the semantic content contributed by the verbal prefixes plays a major role in the process of aspectual composition.

At this point, I would like to consider the role of the theme argument in determining the grade of affectedness of the two classes of verbs. The analysis revealed that different properties of the argument play a role in the composition of affectedness in incremental theme verbs and verbs of contact by impact. For incremental theme verbs, the referential properties of the theme argument matter. A telic predication requires a quantized incremental theme argument. The Germanic languages as well as Upper Silesian and Bulgarian require the theme argument to be quantized explicitly. In the other Slavic languages, the incremental theme argument of an incremental theme verb prefixed by a verbal prefix inducing a monotone-increasing measure on the quantity of the theme argument receives a quantized interpretation of the incremental theme argument.

The marking asymmetry observed with verbs of contact by impact is not sensitive to quantization.[13] Irrespective of whether the theme argument shows quantized reference or not, it is realized as an NP-complement if it has an animate referent (43a), but as a PP-complement if its referent is inanimate (43b).

(43) a. *Dieser Hund beißt Kinder.*
this dog bites children
'This dog is biting children.'

[13]The accusative vs. partitive alternation in the Uralic languages Finnish and Estonian might partially be determined by quantization (e.g. Kiparsky, 1998; Tamm, 2007; Acton, 2014).

b. *Dieser Hund beißt *Schuhe/ in Schuhe.*
this dog bites shoes in shoes
'This dog is biting shoes.'

Animacy rather than quantization determines affectedness in the case of verbs of contact by impact. As the examples in (44) show, animacy does not play a role in the aspectual composition of incremental theme verbs. Irrespective of whether the incremental theme is animate (*Schnecken* 'slugs') or inanimate (*Körner* 'grains'), as long as it is quantized, a telic predication results.

(44) a. *Der Vogel aß drei Schnecken/ drei Körner in zwei Minuten.*
the bird ate three slugs three grains in two minutes
'The bird ate three slugs/three grains in two minutes.'
b. #*Der Vogel aß Schnecken/ Körner in zwei Minuten.*
the bird ate slugs grains in two minutes
'#The bird ate slugs/grains in two minutes.'

It is reasonable to assume that we are not dealing with an accidental pattern but that it is rooted in the very nature of the different degrees of affectedness and that different object dimensions might play a role in their determination. Telicity requires a property delimiting an event. An object's quantity is able to do so – as the discussion in the preceding sections revealed – but animacy cannot. Thus, animacy is not a property with respect to which events can be measured out.

With respect to the two lowest grades of affectedness – potential change vs. being unspecified for change – it is doubtful whether quantity could play a role. The distinction between these two grades of affectedness seems to be a qualitative one, i.e., it is a distinction between whether a certain activity might have an effect on an individual or not. Therefore one might expect that only a property expressing an ontological distinction – in our case a distinction between animate and inanimate beings – matters for these grades of affectedness.

Summarizing this brief discussion, I have predicted that different object properties play different roles within the process of determining a predicate's grade of affectedness. Quantity – and therefore quantization – plays a role with respect to the distinction between quantized and non-quantized changes, whereas a qualitative property like animacy plays a role with respect to the two lowest grades of affectedness. As part of future work, a more detailed analysis of semantic properties relevant in determining affectedness should be undertaken.

2.4 Summary of the main results

The papers summarized in this chapter are concerned with the compositional nature of affectedness; therefore two classes of verbs which are unspecified with respect to affectedness, have been discussed in detail. A central result regarding affectedness in general is the identification of different semantic properties (quantity and animacy) relevant in

determining affectedness.

Aspectual composition plays a prominent role in the studies reported on in this chapter. The central results with respect to aspectual composition consist in a detailed analysis of the semantic properties relevant in determining the aspectual composition of strictly incremental theme verbs in different Slavic languages and their distribution over the complex expression consisting of an incremental theme verb and its theme argument. With respect to the semantic properties, it turned out that Slavic languages require a verbal prefix inducing a monotone-increasing measure on the theme argument's quantity to achieve a telic predication. When it comes to the distribution of the relevant information, a difference was found between Polish on the one hand and Bulgarian on the other. Whereas the information contribution by the verbal prefix is sufficient in Polish, Bulgarian requires in addition explicit quantization of inherently non-quantized incremental theme arguments.

3 Light verb constructions

Light verb constructions (LVCs) are complex predicates consisting of a semantically light (meaning reduced) verb and a phrasal element (e.g. NP or PP). German examples of LVCs made up of the two different types of phrasal elements are shown in (1). The light verb is the grammatical head of the complex predicate and determines, for example, the complex predicate's lexical category. The main predicational content is provided by the phrasal element. In the following, I use the term 'non-verbal element' (NVE) to designate the phrasal element of an LVC.

(1) a. *jemanden eine Frage stellen*
'ask someone a question' (literally 'someone a question put')
b. *jemanden zur Verzweiflung bringen*
'drive someone to despair' (literally 'someone to the despair bring')

The light verb is semantically reduced in comparison to its heavy use. This is evident when comparing the two examples in (2). *Give* in (2a) denotes a spatial transfer of a book to Paul. The predication in (2b), on the other hand, does not express a spatial transfer of a kiss. The kiss is not an object which exists independently of the denoted situation. Rather, the kiss is relevant in constituting the particular situation denoted by the predicate (Butt & Geuder, 2001).

(2) a. *Mary gave Paul a book.* b. *Mary gave Paul a kiss.*

In the literature on light verb constructions, no consensus on the definition of a light verb construction exists (e.g. Van Pottelberge 2001; Winhart 2002; Glatz 2006; Kamber 2008 for German). Nevertheless, it is possible to distinguish LVCs from similar looking constructions such as regular predicate-argument constructions and idioms. *Vor dem Ruin stehen* 'face ruin' (3a) is a light verb construction; the posture verb *stehen* is one of the most frequently occurring light verbs in German. The LVC looks similar to the regular predicate-argument construction *vor dem Haus stehen* 'stand in front of the house' (3b). The difference between the two is that *stehen* 'stand' is used as a heavy verb in (3b) but not in (3a). This is evidenced by examples like (4). In (4a) the posture verb *stehen* is meaningfully contrasted with a verb expressing a different posture. The example in (4b) can be seen as an example of zeugma; *stehen* is a light verb and therefore cannot be meaningfully contrasted with a heavy verb.

(3) a. *Peter steht vor dem Ruin.*
'Peter is facing ruin.'
b. *Peter steht vor dem Haus.*
'Peter is standing in front of the house.'

c. *Peter steht auf dem Schlauch.*
'Peter is at a loss.' (literally 'stand on the hose')

(4) a. *Peter steht nicht vor dem Haus, er kniet davor.*
'Peter is not standing in front of the house, he is kneeling in front of it.'
b. #*Peter steht nicht vor dem Ruin, er kniet davor.*
'Peter is not facing ruin, he is kneeling in front of it.' (literally 'Peter is not standing in front of the ruin, he is kneeling in front of it.')

In (3b), the situation denoted by the predicate – a situation of Peter being located in front of the house in an upright posture – is determined by the heavy verb. Substituting the PP with a different one such as *hinter dem Auto* 'behind the car' does not change the situation type – being located somewhere in an upright posture – but only the location. In (3a), on the other hand, the situation referred to is determined by the NVE and substituting the PP with a different PP results in a different situation. Whereas *vor dem Ruin stehen* 'face ruin' means 'be close to a change of state resulting in, for example, financial ruin', the LVC *unter Beobachtung stehen* 'be under surveillance/observation' means 'being observed'. Thus, the crucial difference between (3a) and (3b) consists in the semantic function of the inflected verb.

The same criterion as discussed above also allows us to distinguish light verb constructions from idioms like the one in (3c). The idiom *auf dem Schlauch stehen* 'be at a loss' has a meaning which is not derived from the meaning of its parts, i.e., it is non-compositional. Consequently, the situation type denoted by the idiom is not determined by one of the idiom's components directly. Rather, it is the idiomatic meaning associated with the multi-word expression which determines the type of denoted situation.

To summarize, the three constructions illustrated in (3) differ with respect to the element determining the denoted situation type. It is the verb in the case of regular predicate-argument constructions, the NVE in the case of LVCs and the idiomatic meaning associated with the multi-word expression in the case of idioms.

A crucial difference between LVCs like *vor dem Ruin stehen* 'face ruin' and idioms such as *auf dem Schlauch stehen* 'be at a loss' is that LVCs are semantically compositional, whereas idioms are not. Evidence in favor of a compositional analysis of LVCs is gained from two observations. First, light verb constructions license internal modification and second, light verb constructions come in families. Internal modification and the existence of families have been taken as evidence for distinguishing different types of idioms (e.g. Ernst, 1981; Gibbs & Nayak, 1989; Nunberg et al., 1994; Sag et al., 2002): idiomatic expressions, which neither license internal modification nor come in families and idiomatically combining expressions, which show both of these properties (the terminology goes back to Nunberg et al. 1994). Nunberg et al.'s criteria for distinguishing between compositional and non-compositional idioms have been applied to light verb constructions by Karimi (1997) and Samvelian & Faghiri (2014) as well as by Fleischhauer et al. (2019); Fleischhauer & Gamerschlag (2019); Fleischhauer & Neisani (2020) and (Fleischhauer, accepted). Although LVCs show properties similar to idiomatically combining expressions, the two are not the same. A crucial difference between them is that in LVCs the NVE is interpreted literally, whereas the non-verbal component of an idiomatically com-

bining expression requires a non-literal interpretation. In the idiomatically combining expression *pull strings*, the noun *strings* is used metaphorically and does not refer to actual physical strings. The nouns used in LVCs are often eventive and are used in their literal meaning.

To illustrate the property of internal modification, the German LVC *eine Anweisung geben* 'give an instruction' can be used. In (5), the adjective *geheim* 'secret' is realized within the NVE *eine Anweisung* 'an instruction' and shows agreement (FEM.SG) with the head of the NP. Various authors (e.g. Schmidt, 1968; Everaert & Hollebrandse, 1995; Nicolas, 1995; Dixon, 2005; Langer, 2005; Megerdoomian, 2012) argue that adjectives realized within the NVE function as adverbial rather than attributive modifiers. Thus, it is proposed that *geheim* has the whole LVC *eine Anweisung geben* rather than the noun *Anweisung* in its scope.

(5) *Im Jahr 1975 gab der Innenminister eine geheime Anweisung an die Generäle der Grenztruppen.*
'In 1975, the Minister of the Interior gave a secret instruction to the generals of the border troops.'

Contrary to the mentioned assumption, the interpretation of (5) is that the Minister of the Interior gave an instruction whose content was secret. This contrasts with an adverbial realization of *geheim* (6), in which it modifies the manner of giving the example. If the attributively realized modifier functions adverbially, the difference in interpretation between (5) and (6)is unexpected. Therefore it is reasonable to conclude that *geheim* in (5) acts as an attributive and not as an adverbial modifier.

(6) *Im Jahr 1975 gab der Innenminister geheim eine Anweisung an die Generäle der Grenztruppen.*
'In 1975, the Minister of the Interior secretly gave an instruction to the generals of the border troops.'

The notion of internal modification was introduced by Ernst (1981) for modifiers which have a single component of a multi-word expression (idiomatically combining expression or LVC) in their scope. External modification, on the other hand, is used for attributively realized modifiers which show a mismatch between their syntactic realization and their semantic scope. A telling example is the sentence *He came apart at the political seams* (Ernst, 1981, 51), in which *political* – although realized attributively – modifies the whole idiom. A paraphrase for the sentence is 'Politically, he came apart at the seams.' With respect to internal modification of idioms, Nunberg et al. (1994, 500) propose: "In order to modify part of the meaning of an idiom by modifying a part of the idiom, it is necessary that the part of the idiom have a meaning which is part of the meaning of the idiom" (a similar view is expressed in Gazdar et al. 1985). The same holds for LVCs; the fact that they license internal modification shows that (at least) the nominal component within the NVE contributes an identifiable meaning to the LVC.

With respect to idiom families, Nunberg et al. (1994, 504) write that "the existence of ANY such family is quite surprising on the standard view of idioms as undergoing

individual rules assigning idiosyncratic interpretations." That we find such families shows that idiomatically combining expressions are not interpreted idiosyncratically but on the basis of systematic patterns. The same is true of light verb constructions, for which the notion of a family is defined as follows:

(7) Light verb constructions form a family iff (i) they are headed by the same light verb and (ii) they show the same interpretation pattern.

The definition consists of a form criterion – identity of the light verb – and a semantic criterion (same interpretation pattern). LVCs show the same interpretation pattern if they are roughly paraphrased the same. The examples in (8) illustrate two Persian LVC-families. The LVCs of the two families are headed by the light verb *kešidan* 'pull'. The LVCs of the first family can be paraphrased as 'smoke N'; the LVCs of the second family are paraphrased as 'build N'.

(8) a. 'smoking'-family: *sigar kešidan* 'smoke cigarettes' (lit. cigarette pull), *pip kešidan* 'smoke (a) pipe' (lit. pipe pull), *hâšiš kešidan* 'smoke marijuana' (lit. marijuana pull)
b. 'building'-family: *jâde kešidan* 'build streets' (lit. street pull), *divar kešidan* 'build walls' (lit. wall pull), *nârde kešidan* 'build fences' (lit. fence pull)
(Samvelian 2012, 151ff.; Family 2011, 13)

The studies reported on in this chapter present detailed investigations of the two above mentioned properties of light verb constructions. Fleischhauer et al. (2019) and Fleischhauer & Gamerschlag (2019) discuss German LVC-families headed by the light verb *stehen* 'stand'. Crucially, the two papers show how the meaning of the respective LVC-family is compositionally derived from the meaning of its parts. Fleischhauer & Neisani (2020) presents a detailed analysis of the internal modification of Persian LVCs.

The last paper summarized in this chapter (Fleischhauer, accepted) investigates the morphosyntactic as well as semantic status of the nominal element within the NVE in some detail. A claim often found in the literature is that the nominal element within the NVE is used non-referentially (e.g. von Polenz, 1963, 1987; Heringer, 1968; Leiss, 2000; Eisenberg, 2013). This claim, it seems, is based on the fact that the main predicational content of the LVC is contributed by the non-verbal element. Building on the analysis presented in Fleischhauer & Neisani (2020), I argue in Fleischhauer (accepted) that NVEs are referential and show in fact the same morphosyntactic properties as regular argument expressions. Based on these results, a syntactic analysis of Persian LVCs is proposed within the framework of Role & Reference Grammar.

3.1 The composition of LVC-families

The existence of LVC-families is one piece of evidence in favor of a compositional analysis of light verb constructions. As a case study, the composition of German LVCs headed by the light verb *stehen* 'stand' has been examined in Fleischhauer et al. (2019) and Fleischhauer & Gamerschlag (2019).

The heavy verb *stehen* 'stand' takes two arguments: a theme argument, which is being located, and a locational argument, which is realized as a spatial PP. Basically, the verb expresses that the referent of the theme argument is located in an upright manner at the location specified by the PP. In (9), it is expressed that Maria is located in a spatial region in front of the spatial region occupied by the referent of *dem Haus* 'the house'.

(9) *Maria steht vor dem Haus.*
'Maria is standing in front of the house.'

In its light use, *stehen* still requires a PP-complement but the PP does not indicate a spatial location anymore. The LVC *unter Beobachtung stehen* 'be under surveillance' (lit. under surveillance stand) consists of light *stehen* and the PP *unter Beobachtung* 'unter surveillance' (10). *Beobachtung* 'surveillance' is an eventive noun – it licenses, for example, temporal modifiers (*die gestrige Beobachtung* 'yesterday's surveillance' (lit. the yesterday surveillance) – and does not refer to a spatial location.

(10) *Der Verdächtige steht unter Beobachtung durch die Polizei.*
'The suspect is under surveillance by the police.'

According to Kamber (2008), *stehen* is one of the most frequent German light verbs. Besides the two studies reported on in this section, light *stehen* has not been analyzed in the literature. Thus, the existence of different LVC-families headed by light *stehen* has gone unnoticed. A number of families formed by the combination of light *stehen* and the prepositions *vor* 'in front of' and *unter* 'under' are listed in (11). The listing is not exhaustive, neither with respect to the number of families, nor regarding the number of LVCs for the individual families.

(11) a. 'prospective'-family: *vor dem Ruin stehen* 'face ruin', *vor der Fertigstellung stehen* 'be close to completion', *vor dem Kollaps stehen* 'be on the brink of collapse', *vor der Vollendung stehen* 'to be near completion', *vor dem Abschluss stehen* 'to be near completion/to be before the end', *vor dem Untergang stehen* 'be on the brink of decline', *vor der Explosion stehen* 'be close to exploding'

b. 'challenge'-family: *vor einem Rätsel stehen* 'be confronted with a puzzle/ be baffled', *vor einer Aufgabe stehen* 'be confronted with a task', *vor dem Problem stehen* 'to be confronted with a problem'

c. 'passive'-family: *unter Anklage stehen* 'be charged with', *unter Verdacht stehen* 'be under suspicion', *unter Strafe stehen* 'be under penalty', *unter Bewachung stehen* 'be under guard/close watch', *unter Aufsicht stehen* 'be under supervision', *unter Beobachtung stehen* 'be under surveillance'

d. 'psych/body state'-family: *unter Schock stehen* 'be in [a state of] shock', *unter Stress stehen* 'be under stress', *unter Alkohol stehen* 'be under the influence of alcohol', *unter Drogen stehen* 'be under the influence of drugs'

The focus of the papers reported on in this section is on the 'prospective'-family of *stehen*-LVCs. The LVCs in (11a) have a prospective reading "in which the subject referent is

in a state or condition preceding an event which is likely to take place and in which the subject referent would be involved as a participant" (Fleischhauer & Gamerschlag, 2019, 146). This prospective meaning is paraphrasable as 'the subject referent is close to the change of state denoted by NP' (Fleischhauer et al., 2019, 79). Thus, *vor dem Ruin stehen* 'face ruin' means 'the subject referent is close to ruin': *Ruin* 'ruin' denotes a change from being not ruined to being ruined, which means going from a state of having money/a good reputation to a state of not having money/a good reputation.[1]

The LVCs of the 'challenge'-family are formed similarly by combining light *stehen* with a *vor*-PP. In order to speak of different families, a meaning difference between the 'prospective'- and the 'challenge'-family needs to exist. In fact, LVCs of the 'challenge'-family are paraphrased differently from the LVCs of the 'prospective'-family. A general paraphrase for the LVCs in (11b) is 'the subject is confronted with NP (e.g. a certain task, question or problem)'. *Vor einer Frage stehen* 'be faced with a question' means that someone is confronted with a question.

Besides the different paraphrases, the two families also show a difference with respect to the licensing of internal modifiers. LVCs of the 'prospective'-family license *kurz* 'short' as a temporal modifier (12a), whereas LVCs of the 'challenge'-family do not (12b).

(12) a. *Die Firma steht kurz vor dem Ruin.*
'The company is close to bankruptcy.'
b. #*Die Bundesregierung steht kurz vor einem Rätsel.*
intended: 'The government is about to be confronted with a puzzle/mystery.'

A compositional analysis of German LVCs of the 'prospective'-family is presented in Fleischhauer & Gamerschlag (2019) as well as in Fleischhauer et al. (2019). Although the two papers differ in the details of the semantic representations, the two analyses are compatible. The focus of Fleischhauer & Gamerschlag (2019) is on a frame semantic representation of the semantic composition of LVCs, whereas Fleischhauer et al. (2019) additionally models the syntax-semantics interface by combining frame semantics with Lexicalized Tree Adjoining Grammar (LTAG).

3.1.1 Fleischhauer & Gamerschlag (2019)

Frames are a cognitively oriented framework for representing conceptual as well as lexical knowledge (Barsalou, 1992; Löbner, 2014). A frame characterizes its referent in terms of recursive typed attribute-value structures (Petersen, 2007). I will illustrate frames by presenting the frame analysis of the heavy use of *stehen* 'stand'. As already argued above, *stehen* is a verb expressing the upright posture of its theme argument; in addition, it allows the specification of the argument's location by a spatial PP. The frame representation for heavy *stehen* is shown in figure 3.1. The verb denotes a state of the type *loc-posture-state*, which is a state in which the theme argument – the bearer of the state – is both in a specific posture and located somewhere. The four attributes THEME,

[1] The definition of the English noun *ruin* is taken from the online Cambridge dictionary (https://dictionary.cambridge.org/dictionary/english/ruin; accessed 25.10.2019).

FIGURE, GROUND and POSTURE characterize the state.[2] Attributes are functional relations, i.e., an attribute assigns a unique value to its bearer. The value of POSTURE, for example, is *upright*. Boxed numbers indicate structure sharing; in figure 3.1 the value of the THEME attribute is identical to the FIGURE attribute's value. FIGURE introduces a localized entity, whereas GROUND introduces the spatial object with respect to which the FIGURE is located.

$$\begin{bmatrix} \textit{loc-posture-state} \\ \text{THEME } \boxed{1} \\ \text{POSTURE upright} \\ \text{FIGURE } \boxed{1} \\ \text{GROUND } \boxed{2} \end{bmatrix}$$

Figure 3.1: Frame representation of the heavy use of *stehen* 'stand' (Fleischhauer & Gamerschlag, 2019, 143).

The location is specified by a spatial-PP. A spatial preposition locates the FIGURE within a neighboring region of the GROUND (Wunderlich & Herweg 1991; Kaufmann 1995, among others). A frame representation for the spatial preposition *vor* 'in front of' is shown in figure 3.2. It is basically expressed that the LOCATION occupied by the FIGURE is contained within the spatial PREREGION of the GROUND, as indicated by the non-functional 'part-of' relation ($\subset$).

$$\begin{bmatrix} \textit{spatial relation} \\ \text{FIGURE } \boxed{1}\begin{bmatrix}\text{LOCATION } \boxed{2}\end{bmatrix} \\ \text{GROUND } \boxed{3}\begin{bmatrix}\text{PREREGION}_{\text{SPATIAL}} \ \boxed{4}\end{bmatrix} \\ \boxed{2} \subset \boxed{4} \end{bmatrix}$$

Figure 3.2: Frame representation of the spatial use of the preposition *vor* 'in front of' (Fleischhauer & Gamerschlag, 2019, 144).

Composition is done via frame unification; the result of unifying the frame of *vor* within a (simplified) frame of *Haus* 'house' is shown in figure 3.3. *Haus* is the internal argument of the preposition *vor* and functions as the value of the GROUND attribute.

Finally, the prepositional phrase *vor dem Haus* 'in front of the house' and the subject NP *Anna* combine with *stehen*, which yields the frame in figure 3.4.

Having illustrated the composition of heavy *stehen* with the spatial *vor*-PP, I now turn to the composition of the LVC *vor der Übergabe stehen* 'be about to be handed over'. An example of this LVC, which belongs to the 'prospective'-family, is shown in (13). The sentence basically expresses that the subject referent (*die Firma* 'the company') is in a state close to the change denoted by the PP-internal noun *Übergabe* 'handover'.

[2] SMALL CAPS are used for indicating attributes.

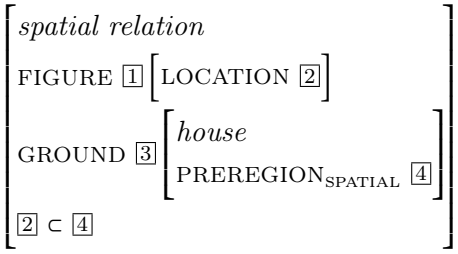

Figure 3.3: Frame representation of the PP *vor dem Haus* 'in front of the house'.

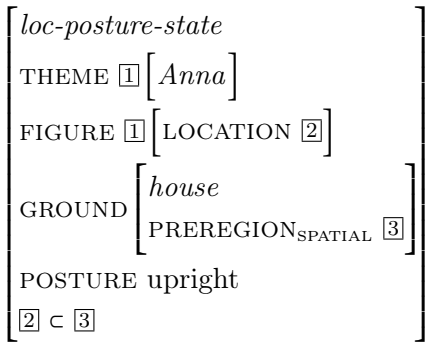

Figure 3.4: Frame representation for *Anna steht vor dem Haus* 'Anna is standing in front of the house' (Fleischhauer & Gamerschlag, 2019, 145).

(13) *Die Firma stand vor der Übergabe an einen Manager.*
'The company was about to be handed over to a manager.'
(Fleischhauer & Gamerschlag, 2019, 146)

The crucial question is where does the prospective meaning come from? As argued in Fleischhauer & Gamerschlag (2019, 147): "One insightful observation is that event noun embedding *vor*-PPs can be used attributively to a noun without a loss of the prospective reading"; an example is shown in (14).

(14) *Eine Firma vor der Übergabe an eine neue Leitung ist immer in einer kritischen Situation.*
'A company before the handover to a new management is always in a critical situation.'
(Fleischhauer & Gamerschlag, 2019, 147)

The example indicates that the prospective interpretation is not dependent on the meaning of the light verb but is contributed by the PP. The preposition *vor*, as used within the LVC, is analyzed as a temporal rather than a spatial preposition. Basically, *vor* locates the FIGURE within a temporal PREREGION of the GROUND. This is indicated in the frame in figure 3.5.

The eventive noun *Übergabe* 'handover' denotes a caused change of possession. This

$$\begin{bmatrix} \textit{temporal relation} \\ \text{FIGURE } \boxed{1}\begin{bmatrix}\text{TIME } \boxed{2}\end{bmatrix} \\ \text{GROUND } \boxed{3}\begin{bmatrix}\text{PREREGION}_{temp} \boxed{4}\end{bmatrix} \\ \boxed{2} \subset \boxed{4} \end{bmatrix}$$

Figure 3.5: Frame representation of temporal *vor* 'before' (Fleischhauer & Gamerschlag, 2019, 148).

is captured in the frame in figure 3.6 by the two attributes CAUSE and EFFECT. The values of the two attributes specify the causing activity and the change of possession. Change of possession is modeled as a change of state: in the initial state, the possessor is identical to the agent of the causing activity, whereas in the resulting state the possessor is identical to the recipient.

$$\begin{bmatrix} \text{AGENT } \boxed{1} \\ \text{THEME } \boxed{2} \\ \text{RECIPIENT } \boxed{3} \\ \text{CAUSE} \begin{bmatrix} \textit{activity} \\ \text{AGENT } \boxed{1} \\ \text{THEME } \boxed{2} \\ \text{RECIPIENT } \boxed{3} \end{bmatrix} \\ \text{EFFECT} \begin{bmatrix} \textit{change of possession} \\ \text{INITIAL STATE} \begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{2} \\ \text{POSSESSOR } \boxed{1} \end{bmatrix} \\ \text{RESULT STATE} \begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{2} \\ \text{POSSESSOR } \boxed{3} \end{bmatrix} \end{bmatrix} \\ \text{TIME } \boxed{4} \end{bmatrix}$$

Figure 3.6: Frame representation of the eventive noun *Übergabe* 'handover' (Fleischhauer & Gamerschlag, 2019, 149).

The combination of temporal *vor* and the eventive noun *Übergabe* is presented in figure 3.7.

Übergabe is realized as the value of the GROUND attribute, which means that the ground is a caused change of state event. The relation between FIGURE and GROUND is that the FIGURE's TIME is part of the GROUND's temporal PREREGION. A temporal preregion is defined as a time interval adjacent to the TIME of the event denoted by the eventive

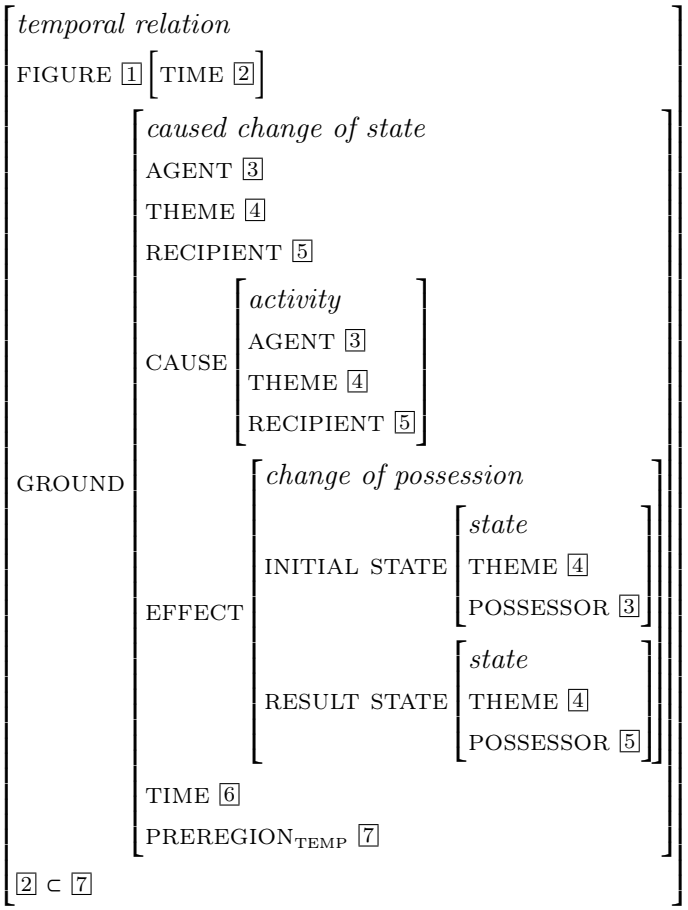

Figure 3.7: Frame representation of the PP *vor der Übergabe* 'before the handover' (Fleischhauer & Gamerschlag, 2019, 150).

noun; thus the event denoted by the external argument of the preposition (the FIGURE) temporally precedes the caused change of possession event denoted by *Übergabe*.

The frame in figure 3.7 already represents the prospective interpretation of the PP *vor der Übergabe*; nevertheless the light verb *stehen* 'stand' is semantically not empty. The light verb contributes the state of the subject referent (see figure 3.8). Light *stehen* does not indicate the posture of its subject argument but introduces – similarly to heavy *stehen* – a figure-ground relation. The composition of light *stehen* and the PP *vor der Übergabe* yields the frame in figure 3.9.

$$\begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{1} \\ \text{FIGURE} \begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{1} \\ \text{TIME } \boxed{2} \end{bmatrix} \\ \text{GROUND } \boxed{5} \begin{bmatrix} \text{TIME } \boxed{3} \\ \text{PREREGION}_{temp} \boxed{4} \end{bmatrix} \\ \boxed{2} \subset \boxed{4} \end{bmatrix}$$

Figure 3.8: Frame representation of light *stehen* 'stand' (Fleischhauer & Gamerschlag, 2019, 153).

$$\begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{1} \\ \text{FIGURE} \begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{1} \\ \text{TIME } \boxed{2} \end{bmatrix} \\ \text{GROUND} \begin{bmatrix} \textit{caused change of state} \\ \text{AGENT } \boxed{3} \\ \text{THEME } \boxed{1} \\ \text{RECIPIENT } \boxed{5} \\ \text{CAUSE} \begin{bmatrix} \textit{activity} \\ \text{AGENT } \boxed{3} \\ \text{THEME } \boxed{1} \\ \text{RECIPIENT } \boxed{5} \end{bmatrix} \\ \text{EFFECT} \begin{bmatrix} \textit{change of possession} \\ \text{INITIAL STATE} \begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{1} \\ \text{POSSESSOR } \boxed{3} \end{bmatrix} \\ \text{RESULT STATE} \begin{bmatrix} \textit{state} \\ \text{THEME } \boxed{1} \\ \text{POSSESSOR } \boxed{5} \end{bmatrix} \end{bmatrix} \\ \text{TIME } \boxed{6} \\ \text{PREREGION}_{\text{TEMP}} \boxed{7} \end{bmatrix} \\ \boxed{2} \subset \boxed{7} \end{bmatrix}$$

Figure 3.9: Frame representation of the LVC *vor der Übergabe stehen* 'be about to be handed over' (Fleischhauer & Gamerschlag, 2019, 152).

3.1.2 Fleischhauer, Gamerschlag, Kallmeyer & Petitjean (2019)

The study reported on in Fleischhauer et al. (2019) also presents a compositional analysis of German LVCs but differs in certain details from the analysis discussed above. Most importantly, Fleischhauer et al. (2019) is not only concerned with the semantic composition of 'prospective'-LVCs but models the syntactic composition as well. This is achieved by combining frame semantics with Lexicalized Tree Adjoining Grammar (LTAG; Joshi & Schabes 1997; Abeillé & Rambow 2000; see Kallmeyer & Osswald 2013 for the combination of frame semantics and LTAG).

A Lexicalized Tree Adjoining Grammar consists of a finite number of elementary trees. Larger trees are derived from elementary trees by two operations: substitution and adjunction. In the case of substitution, a leaf of a tree is replaced by a new tree, whereas adjunction replaces an internal node in a tree by a new tree. Elementary trees are lexicalized; they come with a lexical anchor. As Kallmeyer & Osswald (2013, 274) note, "LTAG allows for a high degree of factorization inside the lexicon, i.e., inside the set of lexicalized elementary trees. One factorization arises from separating the specification of *unanchored* elementary trees from their lexical anchors." Unanchored elementary trees are the result of separating elementary trees from their anchors. Such unanchored trees represent, for example, the different realization of a predicate's subcategorization frame (Kallmeyer & Osswald, 2013, 274).

Heavy and light *stehen* 'stand' are realized in syntactically similar constructions: both require a subject-NP and a PP-complement. Nevertheless, two different constructions for heavy and light *stehen* are proposed, which correspond to the two unanchored trees shown in figure 3.10.

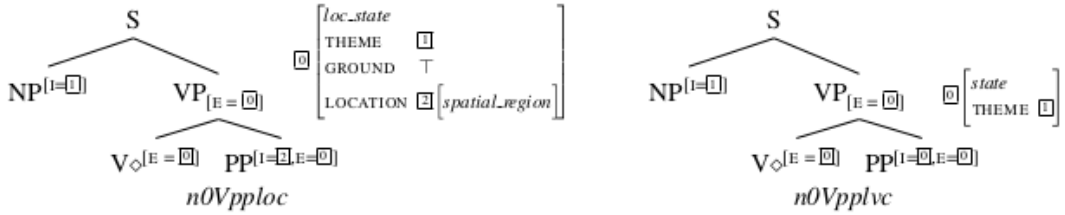

Figure 3.10: Unanchored constructions, which can be anchored by heavy *stehen* (on the left side) and light *stehen* (on the right side) (Fleischhauer et al., 2019, 84).

The syntactic nodes in the trees (e.g. NP, VP) are enriched with interface features: I(NDIVIDUAL) and E(VENT). The interface features contribute labels of nodes in the related frames. For example, the interface feature I at the NP node indicates that the NP contributes the theme argument, which semantically represents the value of the THEME attribute. The two unanchored trees require a verbal lexical anchor – the position of the anchor is marked by the diamond – and take an NP and a PP as their arguments. The unanchored tree on the left side cannot only be anchored by heavy *stehen* but also by other verbs like *sitzen* 'sit', *liegen* 'lie' or *wohnen* 'live'. The two constructions each come with a specific constructional meaning. The tree on the right side describes a locational state, which involves a theme, a location and a ground, while the one on the left side

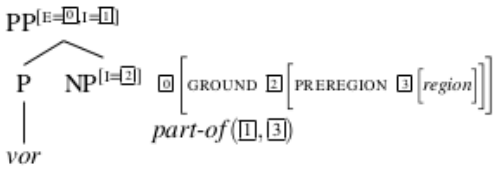

Figure 3.11: Anchored tree for the preposition *vor* (Fleischhauer et al., 2019, 84).

is more general and describes a state, which is determined by the PP. In addition, two different lexical entries for heavy and light *stehen* are proposed. Heavy *stehen* denotes a posture state, while light *stehen* only describes an unspecific state.

Figure 3.11 shows the anchored tree for the preposition *vor*. The preposition describes a *part-of* relation between the value of the I feature at the PP node and a GROUND. Crucially, PREREGION is understood in a general way, covering both *spatial regions* as well as *prestates* of events, both being incompatible subtypes of the type *region*.

Combining the preposition *vor* with the *loc-state* construction (left tree in figure 3.10), the I feature contributes a location. The I feature at the PP node is identified with the I feature at the PP node in the *loc-state* construction, which refers to the value of the LOCATION attribute in the corresponding frame. Since the *part-of* relation is defined between elements having the same type, the value of PREREGION is of the type *spatial region*. In the light verb construction, the I feature has the same value as the E feature and it provides a state. This restricts the value of PREREGION to being of the type *state* as well.

The LVC basically requires a change of state denoting noun to be the PP-internal argument. For such change of state denoting nouns as *Explosion* 'explosion', *Fertigstellung* 'completion' or *Ruin* 'bankruptcy', the general constraints in (15) and (16) are proposed (Fleischhauer et al., 2019, 85). These constraints ensure that a *change of state* has a PRESTATE as well as a RESULTSTATE, which have a value of the type *state*. Furthermore, it is ensured that the THEME of the overall change of state event is identical to the THEME of the PRESTATE as well as that of the RESULTSTATE.

(15) a. *change of state* → PRESTATE : *state*
b. *change of state* → RESULTSTATE : *state*

(16) a. *change of state* → THEME ≙ PRESTATE : THEME
b. *change of state* → THEME ≙ RESULTSTATE : THEME
c. *change of state* → PREREGION ≙ PRESTATE

Building on these constraints, the frame as well as the anchored elementary tree for the NP *der Explosion* 'the explosion' is shown in figure 3.12.

Figure 3.13 shows the complete derivation of the LVC *vor der Explosion stehen* 'be close to exploding'. The combination of LTAG with frame semantics allows an explicit representation of how the different meaning components of the LVC are distributed over its different syntactic building blocks.

The two analyses presented in Fleischhauer et al. (2019) and Fleischhauer & Gamer-

schlag (2019) show how the meaning of a light verb construction is derived from the meaning of its parts. The analyses are explicit with respect to the semantic contribution of the individual components of the LVC. One particular difference between the two analyses is that the one presented in this section proposes constructional meaning in addition to pure lexical meaning, whereas the analysis described in Fleischhauer & Gamerschlag (2019) does without positing constructional meaning.

The analysis presented in Fleischhauer et al. (2019) is explicit not only with respect to the semantic composition of the LVC but also with respect to its syntactic composition by formalizing the syntax-semantics interface using LTAG. The theoretical analysis proposed in Fleischhauer et al. (2019) has also been implemented by using XMG-2 (for details on the implementation, see Fleischhauer et al. 2019, 87f.).

3.1.3 Are *stehen vor*-LVCs aspectual constructions?

In sections 3.1.1 and 3.1.2, the semantic composition of LVCs of the 'prospective'-family has been discussed. The term 'prospective' is taken from Bernard Comrie's (1976) work on aspect. He characterizes prospective aspect as an aspectual form "where a state is related to some subsequent situation, for instance where someone is in a state of being about to do something" (Comrie, 1976, 64). The same aspectual meaning is also subsumed under the label 'proximative' (see Kuteva 2001, 92 for a brief discussion of the different terms). 'Proximative' is characterized by Kuteva (2001, 92) as "a temporal phase located close before the initial boundary of the situation described by the main verb." Given this characterization, the close relationship between prospective/proximative aspect and LVCs of the 'prospective'-family should be evident.

Comrie as well as Kuteva very clearly argue that prospective/proximative is an aspectual rather than temporal notion, as the prospective meaning is freely compatible with any tense. Some languages possess grammaticalized markers of prospective aspect (e.g. the Algonquian language Cree, Wolvengrey 2006; see also the cross-linguistic data in Kuteva 2001, 92ff.) and one might even argue that German does. A possible analysis of the sequence '*stehen*[3] + *vor*-PP' is that it is a grammaticalized aspectual construction rather than a light verb construction. Under such an analysis, one might analyze *stehen* as an aspectual auxiliary rather than a light verb. Such a view might even be supported

[3]The argumentation is clearly restricted to the 'light' uses of *stehen*.

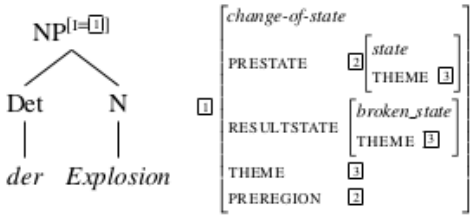

Figure 3.12: Anchored elementary tree for the NP *der Explosion* 'the [DAT] explosion' (Fleischhauer et al., 2019, 85).

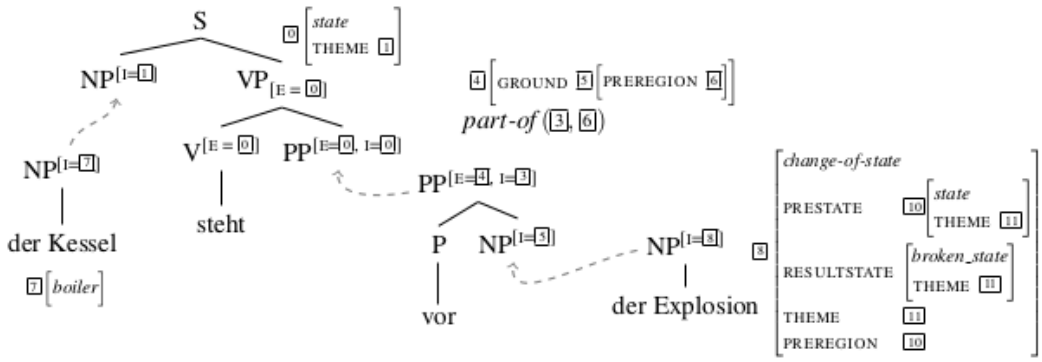

Figure 3.13: LTAG-frame derivation for the LVC *vor der Explosion stehen* 'be close to exploding' (Fleischhauer et al., 2019, 86).

by the fact that posture verbs meaning 'sit', 'stand' and 'lie' are used to express (imperfective) aspect in a number of typologically and genetically unrelated languages (see Kuteva 1999 and Kuteva 2001, chap. 3 for an overview).

In this section, I would like to argue that examples like *vor der Explosion stehen* 'be close to exploding' should be analyzed as LVCs rather than as (semi-grammaticalized) aspectual constructions. To this end, I compare the German examples under discussion with similar looking examples from Dutch and the Turkic languages (17).

(17) a. *Ik stond te wachten.* [Dutch]
I stood to wait.INF
'I was (standing and) waiting.' (Lemmens, 2005, 184)

b. *Ali kitab-i oku-yup tur-du.* [Turkmen]
Ali book-ACC read-GER stand-PST
'Ali kept on reading a book.' (Bowern, 2004, 253)

In the Dutch and Turkmen examples, a finite verb meaning 'stand' is combined with a non-finite verbal form: an infinitive in Dutch and a gerund in Turkmen. Lemmens (2005) analyses Dutch *stond* in constructions like the one in (17a) as being an aspectual auxiliary. Bowern (2004, 252f.) treats Turkmen *tur-* 'stand' – as well as the corresponding verbs in Turkish and Uzbek – as light verbs. Both authors argue that the respective verb meaning 'stand' is semantically reduced and the main predicational content is provided by the non-finite form. The finite form basically contributes the aspectual meaning, i.e., imperfective aspect. This is evidenced by the Dutch example in (18), which shows that the finite verb *zit* 'sit' combines with a non-finite verb which is semantically incompatible with the posture information encoded by *zit*.

(18) *Wat zit ik hier toch rond te lopen?* [Dutch]
what sit I here (*toch*) around to walk?
'Why on earth am I walking (around) here?'
(Lemmens, 2005, 185)

The authors' treatment of the respective constructions in Dutch and Turkic raises the question of where to draw the line between light verb construction and (semi-grammaticalized) aspectual construction. Also, how can light verbs be distinguished from (aspectual) auxiliaries? A closer look at the Dutch and Turkic language data might help answering these questions.

Superficially, the 'aspectual posture verb construction' – as Lemmens (2005) calls it – looks like a light verb constructions headed by a posture verb. But the aspectual posture verb construction differs in several crucial respects from the German *stehen*-LVCs. First, the *stehen*-LVCs take a PP as their non-verbal element, whereas the aspectual posture verb combines with a *te*-infinitive. This is not a strict argument against an LVC-analysis of the aspectual posture verb construction, as V-V-LVCs are attested in a number of Indo-Aryan languages (e.g. Hindi/Urdu and Bengali; see Butt & Lahiri 2013). Second, whereas the NVE is realized as the complement of *stehen*, the *te*-infinitive is not. Rather, as the example in (19) shows, the verb *zit* licenses a spatial-PP complement (*op een stoel* 'on a chair') in addition to the *te*-infinitive. Third, the posture verb is not always desemanticized; in some examples (e.g. (19)) it contributes its specific lexical meaning. This is different for light verbs, as the discussion of the German light verbs already revealed.

(19) *Hij zit (op een stoel) te lezen.*
he sits on a chair to read
'He sits (on a chair) to read.' (= 'He is reading.')
(Lemmens, 2005, 211)

Adopting Lemmens' analysis, it might seem better to treat *zit* in examples like (18) and (18) as being an auxiliary rather than a light verb.

The crucial question now is whether the verbs meaning 'stand' in the Turkic languages pattern more like German light *stehen* or like the Dutch aspectual auxiliaries *staan* and *zitten*. For illustrational purposes, I will use Turkish language data. As the examples in (20) show, Turkish possesses the same construction as Turkmen, which is a combination of the inflected posture verb *durmak* 'stand' and a gerund bearing the gerund marker *-(y)Ip*.[4] Kornfilt mentions that *durmak* not only combines with gerunds but also with inflected verbs (20b).

(20) a. *Ali futbol oyna-yıp dur-du.* [Turkish]
Ali soccer play-GER stay-PST
'Ali kept on playing soccer.'
b. *Hasan bütün gün bir-şey-ler mırıldan-dı dur-du.*
Hasan whole day one-thing-PL mumble-PST stand-PST
'Hasan kept on mumbling things all day over.' (Kornfilt, 1997, 359)

This construction is rarely mentioned in Turkish grammars; exceptions are the gram-

[4] Capitalization indicates a vowel which is subject to vowel harmony, i.e., a morphophonological process operative in, for example, the Turkic languages. For an overview of Turkish vowel harmony, see Kabak (2011).

mars of Lewis (2000, 190), Underhill (1976, 405) and Kornfilt (1997, 358f.). Lewis as well as Kornfilt analyze the construction as 'compound verbs' expressing continuous aspect. Kornfilt (1997, 478) argues that *durmak* is an aspectual light verb that yields – in combination with a gerund or an inflected verb – a verbal compound. The function of the 'light verb' is, according to Kornfilt, to express continuous aspect. Lewis similarly treats examples like (20) as verbal compounds; unfortunately the authors do not provide any justification for their analysis.

A similarity between the Turkish construction and the Dutch one is that *durmak* is a desemantization of the verb. In (20a) it is expressed that Ali is playing soccer, which is not compatible with the expression of a stative location. At the same time, the Turkish construction differs from the Dutch one since it is not possible to add a locational argument (21a). If used as a posture verb, *durmak* requires a locational argument (21b). Thus, it is not possible to realize *durmak*'s argument, which shows that the two uses of the verb differ in their valency.

(21) a. **Ali kitap-i oku-yup ev-in önün-de dur-du.*
Ali book-ACC read-GER house-GEN front-LOC stand-PST

b. *Ali ev-in* **(önün-de) dur-du.*
Ali house-GEN front-LOC stand-PST
'Ali stood in front of the house.'

The most crucial difference between the Dutch and Turkish constructions and German *stehen*-LVCs is the homogeneity of their interpretation. The Dutch and Turkish constructions always have the same aspectual interpretation, irrespective of the lexical meaning of the (non)-finite form.[5] In German, on the other hand, it is only a restricted set of *stehen vor*-LVCs that have an aspectual/modal interpretation, while the others do not. While it is possible to say that '$V_{Posture}$ + *te* + V_{INF} in Dutch and 'V-((*y*)*Ip*) + *durmak*' in Turkish are aspectual constructions – since they always express imperfective aspect – one cannot make the same claim with respect to German '*stehen vor* + NP'. LVCs of the 'challenge'-family (e.g. *vor einem Rätsel stehen* 'be confronted with a riddle') do not have an aspectual flavor. Furthermore, as I have shown in section 3.1.1, it is not the light verb *stehen* but the PP which is responsible for the prospective interpretation. In contrast to this, the aspectual interpretation only arises through the combination of the finite posture verb and the (non)-finite verbal component in Dutch and Turkish. Neither the Dutch *te*-infinitive nor the Turkish gerund have an aspectual interpretation alone.

Based on this brief discussion, I analyze the Dutch posture verbs in (17a), (18) and (19) as well as the Turkish verb *durmak* in (20a) as aspectual auxiliaries rather than as light verbs. Auxiliaries are functional elements, whereas light verbs are not.[6] The crucial criterion is the systematicity of the expression of imperfective aspect in the constructions

[5] This does not mean that every verb can be used as a (non)-finite element in these constructions. In fact, these constructions show restrictions which indicate that they are yet not fully grammaticalized although the Turkish construction seems to be further grammaticalized than the Dutch one; see the discussion in Lemmens (2005) on the restrictions on the Dutch aspectual posture verb construction.

[6] Butt & Lahiri (2013) present a detailed argumentation against conflating light verbs with auxiliaries based on data from the Indo-Aryan languages Hindi/Urdu and Bengali.

headed by these verbs.[7] This is sufficient for the current discussion to claim that we are not dealing with a (semi-grammaticalized) aspectual construction in German but with a clear case of light verb constructions. Furthermore, the discussion allows a clearer separation between light verb constructions and (aspectual) auxiliary constructions.

3.2 Internal modification of LVCs (Fleischhauer & Neisani 2020)

The licensing of internal modification is, in addition to the existence of LVC-families, a second major piece of evidence speaking in favor of a compositional analysis of light verb constructions. The two papers reported on in this section investigate internal modification of Persian LVCs from different perspectives. Fleischhauer & Neisani (2020) is concerned with the interpretation of attributive and adverbial modification of LVCs, whereas Fleischhauer (accepted) focuses on what internal modification reveals about the syntactic composition of LVCs.

Persian – a Western Iranian language – has a limited number of lexically full verbs (according to Mohammad & Karimi 1992, Persian only has 115 full verbs), which is compensated by the frequent use of light verb constructions. In contrast to German, NVEs are more often realized as NPs than as PPs. A further difference to German consists in the order of the different components of an LVC. Whereas the inflected light verb usually precedes the NVE in German declarative main sentences, Persian is verb-final and the NVE precedes the inflected light verb.

Attributive adjectives are usually realized postnominally and require the presence of a linking element, which is called *ezâfe*. The *ezâfe*-morpheme is placed between the modifier and the modified constituent (22a). Adverbial modifiers, on the other hand, are realized without a linking element (22b).

(22) a. *sag e boland*
dog EZAFE loud
'loud dog'

b. *Boland nafas kešid.*
loud breath pull.PST
'S/he breathed loudly.'

Megerdoomian (2012), in her discussion of Persian LVCs, argues that attributively realized adjectives are interpreted adverbially. Taking this as a starting point, the analysis presented in Fleischhauer & Neisani (2020) provides a detailed comparison of attributive and adverbial modification of Persian light verb constructions. The comparison of attributive and adverbial modification shows the existence of two different interpretation patterns. In the first pattern, attributive modification results in a different interpretation than adverbial modification. This is exemplified by the examples in (23). The LVC under discussion is *xunrizi kardan* 'to bleed' (lit. bleeding do). The attributive modifier *ziyâd* 'much' specifies the quantity of the emitted blood, whereas the adverbially used

[7] For the same reason, I do not treat *sein* 'to be' in the so-called *am*-Progressiv or *rheinische Verlaufsform* (*Der Junge ist am Laufen* 'The boy is running') as being a light verb, contrary to, for example, Van Pottelberge (2001).

modifier targets the event's frequency. The two interpretations do not entail each other since someone can bleed often but only emit a small quantity of blood. Similarly, one might just bleed once but emit a large quantity of blood.

(23) a. *U xunrizi ye ziyâd-i kard.*
3SG bleeding EZAFE much-INDEF did
'S/he bled a lot' (= S/he emitted a large quantity of blood.)
b. *U ziyâd xunrizi kard.*
3SG much bleeding did
'S/he bled a lot.' (= S/he bled often.)
(Fleischhauer & Neisani, 2020, 32)

The second pattern – attributive and adverbial modification result in the same interpretation – is exemplified by the examples in (24). The modified LVC is *sedâ dâdan* 'produce a sound' (lit. sound give); the modifiers indicate the loudness of the produced sound. Crucially, the example in (24b) does not mean 'producing a sound loudly', i.e., doing something loudly which produces a sound. *Boland* 'loud' does not indicate the loudness of the subject referent's action. Rather adverbial *boland* targets a property of the noun *sedâ* 'sound'.

(24) a. *Sedâ ye boland-i dâd.*
sound EZAFE loud-INDEF give.PST
'S/he produces a loud sound.'
b. *Boland sedâ dâd.*
loud sound give.PST
'S/he produces a loud sound.'
(Fleischhauer & Neisani, 2020, 30)

Megerdoomian's (2012) claim that attributively realized modifiers are always interpreted externally (meaning adverbially) is not supported by the data. The question now is under which conditions do the two different interpretation patterns arise? Whether the first or the second interpretation pattern obtains depends on whether the respective property targeted by the modifier is licensed by the nominal element within the NVE only (which results in the second interpretation pattern) or by the LVC as well as the nominal element within the NVE (resulting in the first interpretation pattern).

The semantic analysis of the two interpretation patterns starts with the semantic representation of the attributive and adverbial use of Persian adjectives. Although there is no morphological difference between the attributive and the adverbial use of *boland* 'loud' in (22), two different semantic representations for the two uses are proposed. The adjective is analyzed as a measure function, which maps its argument onto a loudness scale. In the attributive use, loudness is a property of an individual. The semantic representation for attributively used *boland* is shown in (25a). Adverbial *boland*, on the other hand, does not directly specify a property of the event; it is not the event of breathing which is loud in (22b) but rather the noise produced by the process of breathing is loud. Thus, loudness is not a property of the event. Instead, the property is related

to an event by some mediating function f (25b). The mediating function is contributed by the respective event description, as I will show below.

(25) a. $[\![\text{boland}]\!] = \lambda x(\text{LOUDNESS}(x) = \text{high})$
b. $[\![\text{boland}_{ADV}]\!] = \lambda P \lambda f \lambda e(P(e) \wedge \text{LOUDNESS}(f(e)) = \text{high})$

The emergence of the different interpretation pattern is accounted for in a compositional analysis adopting Butt and Geuder's (2001) neo-Davidsonian analysis of LVCs. Following Butt and Geuder, it is assumed that light verbs need to compose with an event denoting expression to yield a full-fledged event description. The semantic representation for light *dâdan* 'give' is given in (26). The light verb does not denote an event of its own, which is covered by the fact that its property argument P needs to be saturated by an event denoting expression. TR is a variable for a THEMATIC ROLE attribute since the light verb does not induce a specific thematic role on its subject argument.[8] GIVE-TYPE(e) is the specific semantic contribution of the light verb. Butt & Geuder (2001, 356) assume that light verbs introduce an event predicate, which conjoins with the main event predication. GIVE-TYPE is an abbreviation for the concrete lexical meaning contributed by the light verb. So far, it has not been systematically investigated what the exact semantic contribution of the different Persian light verbs is (but see the discussion in Fleischhauer & Neisani 2020, 27f.).

(26) $[\![\text{dâdan}]\!] = \lambda P \lambda \text{TR} \lambda e \lambda x\ (P(e) \wedge \text{TR}(e){=}x \wedge \text{GIVE-TYPE}(e))$
(Fleischhauer & Neisani, 2020, 25)

Sedâ 'sound' is an eventive noun which has one optional argument – the EMITTER – and one implicit semantic argument, which is the produced sound. The semantic representation of *sedâ* is shown in (27a). Attributive modification precedes the formation of the light verb; the attributive modifier is added before the (complex) NVE combines with the light verb *dâdan*. Modifying *sedâ* by the attributive modifier *boland* yields the semantic representation in (27) for *sedâ ye boland* 'loud sound'.

(27) a. $[\![\text{sedâ}]\!] = \lambda e(\lambda x) \exists y\ (\text{emit}(e) \wedge \text{EMITTER}(e) = x \wedge \text{EMITTEE}(e) = y \wedge \text{sound}(y))$
b. $[\![\text{sedâ ye boland}]\!] = \lambda e(\lambda x) \exists y\ (\text{emit}(e) \wedge \text{EMITTER}(e) = x \wedge \text{EMITTEE}(e) = y \wedge \text{sound}(y) \wedge \text{LOUDNESS}(y) = \text{high})$
(Fleischhauer & Neisani, 2020, 31)

The outcome of the composition of the modified NVE with the light verb is shown in (28).

(28) $[\![\text{sedâ ye boland dâdan}]\!] = \lambda x \lambda e \exists y\ (\text{emit}(e) \wedge \text{EMITTER}(e) = x \wedge \text{EMITTEE}(e) = y \wedge \text{sound}(y) \wedge \text{LOUDNESS}(y) = \text{high} \wedge \text{GIVE-TYPE}(e))$
(Fleischhauer & Neisani, 2020, 31)

In the case of adverbially used *boland*, composition proceeds differently. First, the LVC

[8] The proposed analysis combines elements of a frame analysis, e.g. functional attributes, with neo-Davidsonian event semantics.

sedâ dâdan is composed (29a), and adverbially used *boland* is added in a second step (29b). Adverbially used *boland* is an event modifier and looks for a function mediating between the LOUDNESS attribute and the event argument. The only possible attribute mediating between the LOUDNESS attribute and the event is the EMITTEE attribute (29c). Thus, adverbial *boland* indicates the EMITTEE's LOUDNESS.

(29) a. ⟦sedâ dâdan⟧ = λxλe∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ sound(y) ∧ GIVE-TYPE(e))
b. ⟦boland sedâ dâdan⟧ = λxλeλf∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ sound(y) ∧ GIVE-TYPE(e) ∧ LOUDNESS(f(e)) = high)
c. ⟦boland sedâ dâdan⟧ = λxλe∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ sound(y) ∧ GIVE-TYPE(e) ∧ LOUDNESS(EMITTEE(e)) = high)
(Fleischhauer & Neisani, 2020, 31)

In both cases, *boland* ends up modifying the LOUDNESS of the emittee argument; in (28) this is done directly by attributive modification of the NVE, whereas it is done indirectly in (29c). The reason why the interpretation is the same in both cases is that only one meaning component – the one contributed by the noun *sedâ* – licenses the LOUDNESS attribute.

The other pattern – adverbial and attributive modification resulting in different interpretations – was illustrated by using the LVC *xunrizi kardan* 'to bleed'. The adjective *xiyâd* 'much' specifies a quantity degree, whereas quantity is (re)interpreted as frequency or duration with regard to events (see Fleischhauer 2016a,b, 2018b for a detailed discussion of quantity expressions in the verbal domain). The semantic representation of the eventive noun *xunrizi* 'bleeding' is given in (30a); the representation is very similar to that of *sedâ* since both nouns denote emission events. Also the semantic representation for the light verb *kardan* 'do' is similar to the one proposed for *dâdan* above; the crucial difference lies in the respective lexical contribution of the light verb. The result of the composition of *xunrizi* and *kardan* is shown in (30b).

(30) a. ⟦xunrizi⟧ = λe(λx)∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ blood(y))
b. ⟦xunrizi kardan⟧ = λxλe∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ blood(y) ∧ DO-TYPE(e))
(Fleischhauer & Neisani, 2020, 29)

Starting with the adverbial use of *ziyâd* 'much', the semantic composition of the modifier and the LVC is shown in (31a). A key assumption, argued for in, for example, Doetjes (1997, 2007) and Fleischhauer (2016b), is that every eventive predicate licenses quantity modification. In this case, QUANTITY is a direct property of the event – it measures the event's duration or frequency – and *f* is interpreted as the identity function resulting in the representation in (31b).

(31) a. ⟦ziyâd xunrizi kardan⟧ = λxλeλf∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ blood(y) ∧ DO-TYPE(e) ∧ QUANTITY(f(e)) = high)

b. ⟦ziyâd xunrizi kardan⟧ = λxλeλy (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ blood(y) ∧ DO-TYPE(e) ∧ QUANTITY(e) = high)
(Fleischhauer & Neisani, 2020, 33)

In the case of attributively used *ziyâd*, the adjective combines with the eventive noun before the LVC is composed. Although *xunrizi* is an eventive noun, *ziyâd* cannot modify the event directly. *Xunrizi ye ziyâd* does not simply mean 'frequent bleeding' (cf. Fleischhauer & Neisani, 2020, 33f.). Rather the adjective modifies the QUANTITY of the EMITTEE. The composition proceeds as shown in (32).

(32) a. ⟦xunrizi ye ziyâd⟧ = λe(λx)∃y (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ blood(y) ∧ QUANTITY(y) = high)
b. ⟦xunrizi ye ziyâd kardan⟧ = λxλeλy (emit(e) ∧ EMITTER(e) = x ∧ EMITTEE(e) = y ∧ blood(y) ∧ QUANTITY(y) = high ∧ DO-TYPE(e))

We arrive at two different interpretations since the QUANTITY attribute is licensed by two different constituents: namely the nominal element of the NVE and the LVC as a whole. Attributive *ziyâd* only has scope over the noun and therefore cannot end up as an event modifier of the LVC.

Exploring the adverbial and attributive modification of LVCs helps answer the question as to which meaning components of an LVC are contributed by the different components. It especially helps determine which meaning the light verb contributes. Methodologically, modification is a way of getting access to the meaning of the LVC's components.

3.3 A syntactic analysis of Persian light verb constructions (Fleischhauer accepted)

A topic repeatedly taken up in Persian linguistics is whether all combinations of '(bare) noun + verb' represent the same type of complex predicate or not. This is a pressing question since Persian makes frequent use of bare noun arguments. Ghomeshi & Massam (1994); Vahedi-Langrudi (1996) and Mahmoodi-Bakhtiari (2018, 295) argue that the two examples in (33) represent the same type of complex predicate, whereas others (Mohammad & Karimi, 1992; Lazard, 1992; Megerdoomian, 2012; Modaressi, 2014) argue that the examples exemplify two different types of complex structures. Modaressi, for example, treats the example in (33a) as a light verb construction, and the one in (33b), in contrast, as an instance of pseudo-incorporation.

(33) a. *jâde kešidan*
road pull
'to build a road'

b. *goosht xordan*
meat eat
'to meat-eat/meat-eating'

Arguments supporting one or the other view are very rarely presented in the literature. Modaressi (2014) stipulates that pseudo-incorporation is a semantically compositional process, whereas the construction of LVCs is not. I agree with Modaressi that the two

examples in (33) represent two different types of complex predicates, but I disagree when it comes to compositionality. I conceive of both constructions as being semantically compositional.[9]

The notion of pseudo-incorporation goes back to Massam (2001); she observes that bare nouns in object position show the same semantic properties as morphologically incorporated nouns. (Pseudo-)incorporated nouns are non-referential, which is evidenced by the fact that they are number neutral, discourse opaque, show obligatory narrow scope with respect to scope bearing elements (e.g. negation) and show strong restrictions with respect to modification.[10] The Persian example in (34) shows that the bare noun *sib* 'apple' is non-referential; the noun cannot be picked up anaphorically. Furthermore, *sib* is number neutral, allowing for a singular as well as a plural interpretation.

(34) *Mân sib xârid-âm. #Xeili xošmazeh ast.*
1SG apple buy.PST-1SG very tasty is.3SG
'I bought an apple/apples. It is very tasty.'
(Modaressi, 2014, 25)

The example in (35) shows that the negation has scope over the noun *film* 'movie' (narrow scope reading) but that a wide scope reading is not possible.

(35) *Ali film ne-mixârâd.*
Ali movie NEG-buy.3SG
'Ali does not buy any movie.' [¬ > ∃]
not: 'There is a (particular) movie Ali does not buy.'
(Modaressi, 2014, 30)

Since pseudo-incorporated nouns are non-referential, modification is restricted to kind-level modifiers (36). A similar restriction is mentioned by Espinal & McNally (2011) for Spanish and Catalan.

(36) *Ketāb e elmi/ *ziba nevešt-âm.*
book EZAFE scientific/ beautiful write.PST-1SG
'I write (a) science book(s)/ beautiful book(s).'

Only bare nouns in object position can be pseudo-incorporated; non-bare nouns are usually interpreted referentially and therefore do not show the abovementioned properties. This can be clearly seen by contrasting the examples in (37). The noun *gorbeh* 'cat' is pseudo-incorporated into the verb and is interpreted as number neutral (37a). In (37b), the noun takes accusative case marking, which in Persian results in a referentially specific or definite interpretation.[11] Since the noun is used referentially, it is not interpreted as

[9] Chung & Ladusaw (2004) introduce a new mode of composition ('restrict') for pseudo-incorporation. Fleischhauer & Neisani (2020) argue that LVCs are not composed by the restrict operation, but rather an analysis in terms of functional application is proposed.

[10] For an overview of pseudo-incorporation, see Borik & Gehrke (2015). For an overview of morphological incorporation, see, for example, Massam (2009).

[11] Persian shows definiteness-based differential object marking, restricting accusative case marking to

number neutral but only allows an interpretation in accordance with number marking (which is singular in this particular example). The example in (37c) shows that the case marked noun has wide scope with respect to the negation operator.

(37) a. *Gorbeh did-âm.*
cat see.PST-1SG
'I saw (a) cat/cats.'
b. *Gorbeh râ did-âm. #Xeili ziba bood-ând.*
cat ACC see.PST-1SG very pretty be.PST-3PL
'I saw the cat. #They were very pretty.'
c. *Gorbeh râ na-did-âm.*
cat ACC NEG-see.PST-1SG
'I didn't see the cat.' [∃ > ¬]

Whereas the pseudo-incorporated noun is necessarily bare, the nominal element used within a light verb construction is not. Nouns used as the non-verbal element of an LVC license the full range of functional nominal morphology (for a detailed discussion of the licensing of functional nominal morphology within Persian LVCs, see Fleischhauer & Neisani 2020, chap. 3.) The example in (38) shows the use of the LVC *sedâ dâdan* 'produce a sound' (lit. sound give); the noun bears plural as well as indefiniteness marking. Although *sedâ* is used referentially, it still forms a complex predicate with light *dâdan*. Thus, functional morphology and referentiality only block pseudo-incorporation but not the formation of light verb constructions.

(38) *Âbgarmkon sedâ-hâ-i dâd. Xeili boland bud-dan.*
boiler sound-PL-INDEF gave very loud be.PST-3PL
'The boiler produced some [specific] sounds. They were very loud.'
(Fleischhauer & Neisani, 2020, 13)

A further difference between pseudo-incorporation and light verb constructions is found with respect to the verb used. In a light verb construction, the verb is semantically light and the main predicational content is contributed by the NVE. The verb *didan* 'see' (37) in (37a) is not a light verb but is used as a heavy verb. The verb's meaning is 'to see' and it is the lexical contribution of the verb which constitutes the main predicational content. Furthermore, the verb contributes the same lexical meaning irrespective of whether its object argument is pseudo-incorporated (37a) or not (37b).

Based on this discussion, we can identify three basic predicational construction types, each of which have specific morphosyntactic as well as semantic properties. I identify a predicational construction type as a specific morphosyntactic construction which realizes the sentence predicate. Two of the predicational construction types – pseudo-incorporation constructions (e.g. (37a)) and regular predicate-argument constructions (e.g. (37b)) – impose restrictions on the morphosyntax as well as the semantics of their object arguments. These two constructions differ from light verb constructions essentially with respect to the verb. The distinguishing properties of these three predicational

object arguments that are conceived as having (at least) an indefinite specific interpretation.

construction types are summarized in table 3.1.[12]

Predicational construction type	**Noun**	**Verb**
pseudo-incorporation construction	semantics: non-referential object argument morphosyntax: bare noun	heavy verb
regular predicate-argument construction	semantics: referential object argument morphosyntax: non-bare noun	heavy verb
light verb construction	semantics: *no restrictions on referentiality* morphosyntax: *no restriction*	light verb

Table 3.1: Summary of the semantic and morphosyntactic properties of Persian predicational construction types (Fleischhauer, accepted, 9f.).

The crucial difference between the first two predicational construction types is whether the object argument of the (heavy) verb is used referentially or not. This leads to the question of whether the NVE is also an argument of the light verb or not. Supporting evidence for the view that the NVE is an argument of the light verb is gained from passivization (39). Contrasting the active voice use of *mesâl zadan* 'give an example' (lit. example hit) (39a) with a passive construction of the LVC shows that the NVE *mesâl* becomes the subject under passivization. In line with Samvelian (2018, 262), I conclude that the NVE shows the same syntactic distribution as bare and non-bare direct objects.

(39) a. *Moâlem e âlmâni ye mân mesâl e xub-i*
teacher EZAFE German EZAFE 1PL.POSS example EZAFE good-INDEF
zad.
hit.PST
'Our German teacher gave a good example.'

b. *Mesâl e xub-i zade šod.*
example EZAFE good-INDEF hit.PPART become.PST
'A good example was given.'

(Fleischhauer, accepted, 11)

The data discussed above have consequences for the syntactic analysis of Persian LVCs. Within the framework of Role & Reference Grammar (RRG, Van Valin e.g., 2005), (Per-

[12] Van Valin (2008) introduces the notion of a referential phrase (RP) for phrases headed by referentially used lexical elements.

sian) LVCs are analyzed as nuclear junctures (e.g. Saeedi 2009, 2016, 2017; Nolan 2014; Staudinger 2018). RRG basically distinguishes three syntactic layers, which are nucleus, core and clause. The nucleus contains the predicate, and the core consists of the nucleus and the predicate's arguments, while the clause contains the core and additional non-arguments. Complex sentences are analyzed in terms of juncture and nexus types. For the current discussion, it is only relevant to introduce the notion of nuclear cosubordination. As Van Valin (2005, 183) notes, in a cosubordination relation "units of equal size are joined together in a coordination-like relation, but share some grammatical property." Thus, we are dealing with a symmetrical linkage relation – the joined units are of equal rank, for instance, both are nuclei – and share at least one grammatical category.

Analyzing Persian LVCs in terms of nuclear cosubordination results in the claim that LVCs consist of two nuclei: a verbal nucleus and a non-verbal nucleus. Following this analysis, the NVE should be a nominal nucleus, which is joined with a verbal nucleus to form a complex nucleus. A simplified syntactic tree for the LVC *sedâ dâdan* 'produce a sound' along the lines of Saeedi's (2009; 2016; 2017) nuclear cosubordination analysis is shown in figure 3.14.

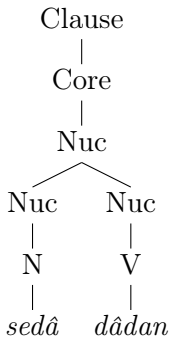

Figure 3.14: Simplified syntactic tree for the LVC *sedâ dâdan* 'produce a sound'.

If the nuclear cosubordination analysis of Persian LVCs is true, the NVE can host neither core- nor /NP-level operators. Within Role & Reference Grammar, number is analyzed as a nominal core operator, whereas in-/definiteness is an NP-level operator (Van Valin, 2005, 24). The example in (38) has shown that Persian LVCs license number as well as indefiniteness marking within the NVE. Thus, the nominal element needs to be a full NP rather than just a nominal nucleus. LVCs cannot be analyzed in terms of cosubordination since the joined units are not of equal rank. Rather than proposing a clause linkage analysis of Persian LVCs, I assume – in line with the linguistic data discussed above – that the NVE is realized as a core argument of the light verb. The revised syntactic analysis for the LVC *sedâ dâdan* is sketched in the syntactic tree in figure 3.15.

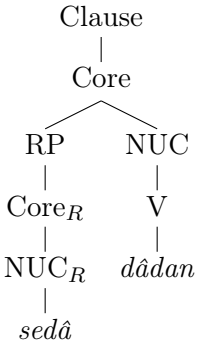

Figure 3.15: Revised syntactic tree for the LVC *sedâ dâdan* 'produce a sound'.

3.4 Noun types and compositionality

The last section discussed the semantic as well as morphosyntactic properties of the nominal element within Persian LVCs. The nouns in the LVCs under discussion are eventive and license nominal morphology (e.g. plural and indefiniteness marking). Karimi-Doostan (2011) proposes a connection between these properties and the separability of the NVE from its light verb. He proposes that only eventive nouns can be separated from the light verb by, for example, attributive modifiers. Following his analysis, there is a direct relation between the licensing of internal modifiers and the type of noun within the NVE. Karimi-Doostan distinguishes between eventive nouns, verbal nouns and non-eventive nouns. The three types of nouns differ with respect to the entity they are referring to (eventuality vs. individual) as well as with respect to their morphosyntactic properties. Eventive nouns as well as verbal nouns refer to eventualities, whereas non-verbal nouns do not. Eventive nouns and non-eventive nouns share nominal features like being compatible with demonstrative determiners. These properties are summarized in table 3.2.

Type of noun	**refers to ...**	**nominal features?**
eventive noun	eventuality	yes
verbal noun	eventuality	no
non-eventive noun	object	yes

Table 3.2: Classification of Persian nouns (based on Karimi-Doostan 2011).

According to Karimi-Doostan (2011), neither verbal nouns nor non-eventive nouns can be separated from their light verb. His explanation for the separability of the eventive noun from the light verb is that such nouns refer independently to eventualities and therefore are more independent of the light verb than non-eventive nouns are. Verbal nouns cannot be separated since, as Karimi-Doostan (2011, 91) states, they cannot function as the lexical head of a DP.

The proposed relationship between noun type and separability does not hold true, as

shown in Fleischhauer (accepted). *Jâde* 'street' forms with the light verb *kešidan* 'pull' an LVC meaning 'build (a) street(s)'. As the examples in (40) show, the non-eventive noun can be separated from the light verb by attributively used adjectives.

(40) a. *jâde ye gerâni kešidan*
road EZAFE expensive pull
'build an expensive road'
b. *jâde ye mârpič kešidan*
road EZAFE twisted pull
'build a twisted road'

These data further support the view that the nominal element within the NVE is a referential rather than a predicational element. At the same time, the data show that semantically compositional LVCs do not necessarily have an eventive noun within their NVE.[13] Such LVCs are found not only in Persian but in German as well; for example, the LVCs of the 'challenge'-family like *vor einem Rätsel stehen* 'be confronted with a puzzle/mystery' or *vor einem Problem stehen* 'be confronted with a problem' have an eventive noun within their NVE. If the respective LVCs only consist of non-eventive elements, the resulting question is how the LVC's event predication is compositionally derived.

A plausible hypothesis might be that the event, denoted by the LVC, is inferred on the basis of the meaning of the non-eventive noun. In the semantics literature on artefact nouns (e.g. Nichols, 2008; Grimm & Levin, 2017; Levin et al., 2019), it is assumed that the meaning of such nouns (e.g. *cigarette, road*) includes associated events. Such events are usually events of creating the respective artefact or events in which the respective artefact fulfills its intended function. The Persian artefact noun *jâde* 'street' is lexically associated with a creation event; the LVC *jâde kešidan* 'build (a) street(s)' has a creation meaning. In the case of the Persian LVC *sigar kešidan* 'smoke (a) cigarette(s)' (41), a use event is inferred, resulting in the meaning of smoking (a) cigarette(s).

(41) *sigar kešidan*
cigarette pull
'smoke (a) cigarette(s)'

This brief discussion presents a way of providing a semantically compositional analysis of LVCs consisting of a light verb and a non-eventive non-verbal element. A more complicated issue is provided by the German 'challenge'-family (*vor einem Problem stehen* 'be confronted with a problem'). The noun *Problem* 'problem' is not an artifact noun but can be analyzed as a 'shell noun' (following Schmid 2000). Shell nouns are 'containers' for complex propositional information. It is not evident whether shell nouns license an event inference or whether the respective event is contributed by a different LVC component. The 'challenge'-family might turn out to be interesting with respect to the question of whether the meaning of an LVC can be strictly derived from the meaning of

[13] The LVC *jâde kešidan* belongs to the 'building'-family already mentioned in the introduction to this section (see page 32).

its parts or whether we need a constructional meaning in addition. A detailed analysis of the occurrence of non-eventive nouns within LVCs is still lacking and this needs to be investigated in the future.

3.5 Summary of the main results

The papers summarized in this chapter investigate the composition of the lexical meaning of light verb constructions and how the individual meaning components are distributed over the LVCs' components. In two case studies on German 'prospective'-LVCs ('*stehen vor* + NP'), the composition of the LVCs' lexical meaning has been discussed in detail.

Although a compositional view on light verb constructions is meanwhile accepted by a number of researchers (e.g. Butt & Geuder 2001, 2003; Müller 2010; Samvelian & Faghiri 2014, 2016), the semantic composition has rarely been discussed explicitly in the semantics literature. Notable exceptions come from work on the composition of the complex predicate's event structure (e.g. Karimi, 1997; Folli et al., 2005; Pantcheva, 2009; Winhart, 2002) and from Butt and Geuder's (2001) seminal work on the composition of LVCs. The work on event structure usually neglects lexical semantics and therefore only covers a part of the meaning of light verb constructions. The papers summarized in chapter 3 adopt a compositional view on LVCs and fill the gap in the composition of the lexical meaning of light verb constructions.

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