

STRUCTURE AND INTERPRETATION ACROSS CATEGORIES

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Johanna Benz

Dedicated to the memory of my father Manfred Benz, whose love of words inspired mine.

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ABSTRACT

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Johanna Benz

David Embick

This dissertation takes as its starting point the assumption that word formation is syntactic (and piece-based, with Distributed Morphology and related frameworks), and focuses on a point of tension that is inherent to this assumption: If word formation is syntactic and ‘words’ are really just smaller syntactic structures, then why do they appear to behave differently from larger syntactic structures for purposes of interpretation at the interfaces? Why are they so selective in determining which pieces may become a part of the structure? Why do they show so many idiosyncratic and unpredictable forms and meanings?

These questions are investigated in the empirical domain of German derivational morphology, with a focus on phenomena involving prefixation and category change. In a syntactic theory of word formation, morphologically complex structures are syntactically complex, involving Roots, categorizers, and preverbal elements all as syntactically distinct components of the structure. These small but complex structures are the testing ground for hypotheses in response to the questions posed above.

Three case studies from German are presented. The first explores the ‘content’ reading of nominalizations, in which a nominalization is identified with the propositional content of its CP complement (‘the observation that dolphins have returned to the region’). I argue that the content reading sheds new light on the systematic polysemy of deverbal nominalizations and tests the implications of allosemy. The second case study is concerned with verbal prefixes, particles, and resultatives. I argue that the three-way comparison between prefixes, particles, and resultatives exposes contradictory assumptions in the previous literature, and leads to a refinement to our understanding of the locality domains of allosemy. The third case study combines an investigation of the nominalization of prefixed verbs with a discussion of the limits of multiple derivational affixation: I argue that these limits involve the conditions that allow derivational morphemes to interact with the syntactic and semantic properties of their hosts.

TABLE OF CONTENTS

ACKNOWLEDGMENT	iv
ABSTRACT	vi
LIST OF TABLES	ix
LIST OF GLOSSING ABBREVIATIONS	x
1 INTRODUCTION	1
1.1 RESEARCH QUESTIONS	2
1.2 ROOTS AND CATEGORIZERS	7
2 ALLOSEMY	13
2.1 CONCEPTUALIZING ALLOSEMY	14
2.1.1 Two approaches	15
2.1.2 Excluding homophony and idioms	24
2.2 ALLOSEMY WITHIN CATEGORY	27
2.3 ALLOSEMY AND ARGUMENT STRUCTURE	33
2.4 DOMAINS AND DIRECTIONALITY	37
2.4.1 Locality	38
2.4.2 Directionality and defaults	40
2.5 CROSS-LINGUISTIC PATTERNS IN ALLOSEMY	41
2.6 ON WHAT FOLLOWS	43
3 CONTENT NOMINALIZATIONS	45
3.1 INTRODUCING THE READINGS	47
3.2 THE SYNTAX AND INTERPRETATION OF DEVERBAL NOMINALIZATIONS	51
3.2.1 The postnominal genitive	53
3.3 SELECTING CP	56
3.3.1 CPs between argumenthood and selection	56

3.3.2	Nouns and (clausal) arguments	61
3.4	LESSONS FROM THE CONTENT READING	63
3.5	ALLOSEMY IN THE SELECTION OF CONTENT	69
3.6	ALLOSEMY AND ONTOLOGY	76
4	PREFIXES, PARTICLES, AND RESULTATIVES	81
4.1	CO-OCCURRENCE RESTRICTIONS	88
4.2	THE SYNTAX AND SEMANTICS OF RESULTATIVES	94
4.2.1	Complex predicates and small clauses	99
4.3	PREFIXES AND PARTICLES: SYNTAX AND INTERPRETATION	107
4.3.1	Syntax	108
4.3.1.1	Prefixes, category, and argument structure	117
4.3.1.2	Particles, category, and argument structure	123
4.3.2	Interpretative properties	128
4.4	PREVERBAL ELEMENTS: STRUCTURE AND INTERPRETATION	133
4.5	DISCUSSION	139
4.5.1	The co-occurrence restriction: Exceptions	140
4.5.2	Weak resultatives	145
5	PREFIXES IN NOMINALIZATIONS	148
5.1	PARTICLE VERBS NOMINALIZED: THE STRUCTURE PROBLEM	152
5.1.1	Excursus: Exponents and gender	158
5.2	NOMINALIZED INFINITIVES	159
5.3	<i>-ung</i> NOMINALIZATIONS	163
5.3.1	Complex events under <i>-ung</i>	164
5.3.2	Against the containment principle	169
5.4	<i>Ge-</i> <i>-e</i> NOMINALIZATIONS	171
5.5	CONSTRAINTS ON MULTIPLE DERIVATION	182
6	CONCLUSION	185
6.1	FINDINGS	185
6.2	THEMES AND DIRECTIONS	187
6.2.1	Theme 1: The separation of syntax and semantics	187
6.2.2	Theme 2: Locality in allosemy	187
6.2.3	Theme 3: Regularity in derivational morphology	188
	BIBLIOGRAPHY	189

LIST OF TABLES

1	Potential applications of contextual allosemy.	27
2	Some German content nominalizations.	49
3	Co-occurrence restrictions.	93
4	Prefixes and Particles.	110
5	Co-occurrence restrictions.	133

LIST OF GLOSSING ABBREVIATIONS

ACC	accusative
ADJ	adjective
COMP	complementizer
DAT	dative
DEM	demonstrative
GEN	genitive
IND	indicative
INF	infinitive
INTR	intransitive
NMLZ	nominalizer
NOM	nominative
PL	plural
PRT	particle
PST	past
PTCP	participle
REAL	realis
REFL	reflexive
SBJV	subjunctive
TR	transitive
VBZ	verbalizer

1

INTRODUCTION

1.1 RESEARCH QUESTIONS	2
1.2 ROOTS AND CATEGORIZERS	7

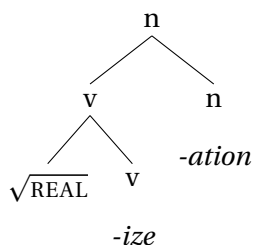
Derivational morphology is intricately related to its syntactic context, interpretation, and exponence. For this reason, it can seem like a particularly blurry domain of investigation: revealing systematicity in the connections of these parts of the grammar requires pinning down what meanings are contributed or shifted by derivational morphemes, how different exponents of categorizing heads are related to each other, and how syntactic properties are affected when words change category, including but not limited to argument and event structure. The results are rarely clear-cut, generalizations usually not without exceptions; frequently, one component of the grammar pushes the analysis in one direction, before another component pulls it somewhere else. In the chapters below, I let myself be pushed and pulled with an empirical focus on three phenomena in German derivational morphology: clause-embedding nominalizations, preverbal elements (prefixes, particles, and resultatives), and nominalizations of prefixed verbs. In this introductory chapter, I lay out the research questions and the case studies that are meant

to address them, before giving some general background on the previous theoretical results that this work builds and relies on.

1.1 RESEARCH QUESTIONS

The properties of category change constitute a core research area in the domain of derivational morphology and its relationships to syntactic context, interpretation, and exponence. In piece-based morphological theories such as Distributed Morphology (DM), categorizing morphemes (generally notated v , n , a ...) are *abstract* and thus only indirectly related to phonologically overt exponents (such as English $-al_N$ or German $-ung_N$). Because the relationship between different derivatives of a common Root is established through the syntactic application of one or more categorizers and potentially other derivational morphemes, the surrounding syntactic structures are equally related: they embed a common Root and potentially a common first categorizer (in the case of e.g. deverbal nominalizations), and only diverge at the level of a higher categorizer. For instance, in the noun *realization*, under the assumption that it contains an overt verbalizer $-ize$, we can ask which properties are contributed by the Root, which by the initial categorizer v , and which by the higher categorizer n (for some relevant background on Roots and categorizers, see Section 1.2). Relatedly, note that the structure in (1) is syntactically ‘small’ in the sense that it does not include phrasal projections – the precise set of functional heads and whether they project phrases constitute questions of active debate in the research on nominalizations and other morpho-syntactically complex forms. I return to these questions in the next subsection.

(1)



Nominalization is perhaps the particular instance of cross-category derivation for which these ques-

tions regarding their syntactic structure have been spelled out most frequently in the previous literature. Special attention has been paid to the question whether deverbal nominalizations can take arguments (Chomsky 1970; Grimshaw 1990; Alexiadou 2001; Borer 2013 a.m.o.). For example, is the ability of the noun *observation* to take an argument that is interpreted as a Theme related to the fact that *observation* derives from the verb *observe*? Comparison with a simple noun like *table* would suggest that it is.

- (2) a. The captain's *observation* of the night sky delighted him
 b. The first mate's *table* (*of the food) fell over

Thus, comparisons of this kind raise the question whether some properties of deverbal nominalizations, such as their potential for eventive interpretation in, or their ability to take arguments, are due to them being deverbal syntactically, because they include one or more functional heads from the verbal domain, such as *v*. This question has frequently been answered in the affirmative, but, as we will see throughout the dissertation, this answer raises multiple further questions, such as whether the verbal heads introduce arguments or the event interpretation *directly*, whether they are present in all deverbal nominalizations, whether they project phrases, and so on.

While argument-taking is the best-studied aspect of nominalization, and also a particular point of focus in the present study, it is far from the only syntactic property that is relevant in work on the syntactic contexts and implications of derivational morphology. Consider for example Merchant's (2019) observation that while many Roots in English select for the same preposition across categories (*rely_V on*, *reliance_N on*, *reliant_A on*), there is also a significant number of Roots that do not show this uniformity in selection (*pride_V oneself on*, *pride_N in*, *proud_A of*). I have come to think of the tension that is raised by these examples as highly characteristic of derivational morphology: We can detect regularities and sub-regularities, but are ultimately faced with a choice about the weight we give to these regularities, and the weight we give to competing patterns and exceptions. It is not just that most of the generalizations about derivational morphology that I discuss in the following chapters are not exceptionless, but also that they are often narrow generalizations from the start, covering only a small corner of a particular derivational process. Nonetheless, any theory that maintains a relationship between derived forms with a common

Root has to contend with both the regularities and irregularities in form, syntax, and interpretation that we observe. With respect to the syntax, the question that is raised by these phenomena is:

- (3) **Q1:** When words undergo derivation, how are selectional properties and argument structure more broadly affected in the syntax?

In addition to the questions surrounding which properties of the *syntactic* structure project from the Root or an initial categorizer, and which are introduced at the level of a higher categorizing or other derivational morpheme, category change also raises interesting questions in the area of the meaning of such complex words. While work in DM has traditionally focused on the relationship between the abstract morphemes in the syntax and overt realizations (i.e., on morphological operations on the ‘PF’ side), recent work (with some less recent precursors) has begun to explore the possibility that the relationship between the abstract morpheme and its *interpretation* might be similarly complex. It has long been recognized that meaning composition is more flexible or idiosyncratic in an ‘inner’ domain of Root-adjacent word formation (cf. Marantz 2001; Arad 2003). What has received less attention is that it is also (possibly trivially) true that words with shared Roots tend to overlap significantly in the meaning space, and that even meanings that are contributed by inner categorizers can be retained (as in the case of event nominalizations of the *observation*-type retaining verbal characteristics). In these latter senses, word-internal meaning composition seems far from irregular, which means that it seems highly desirable to ascribe the relatedness in meaning of words related in their morpho-syntactic components to some principled mechanism. If we consider the tension between the idiosyncrasy and regularity of word-internal meaning composition to be essentially unresolved, it leads us to ask:

- (4) **Q2:** How compositional, transparent, and predictable is the interpretation of derivational morphology?

Note that this question, which is addressed in various ways in current research on *allosemy*, could easily have different answers depending on which of the three adjectives in (Q2) we focus on: For exam-

ple, in a given instance of derivational morphology, the meaning could be compositional without being fully transparent or predictable (I will argue in chapter 4 that this is the case for verbal prefixation). It should also be noted that this question necessarily interfaces with lexical semantics, and requires the delineation of phenomena in meaning with respect to what part of the interpretation is contributed by the (additional) structure, and what part is contributed by our conceptual knowledge of words and the world.

To address the two questions (Q1) and (Q2) in tandem, this dissertation contains an overview of current considerations in research on allosemy, as well as three case studies in German.

In **Chapter 2**, I begin by surveying the existing literature on allosemy both as a mechanism in the grammar and as a family of phenomena. In addition to providing a summary of the state of the art, this chapter also contains some speculations about future directions in the study of allosemy, and it foreshadows some of the results from my own case studies at the core of this dissertation.

Chapter 3 discusses nominalizations with clausal complements in German. I explore the implications of the *content* reading, in which a nominalization is identified with the content of a following CP complement, cf. ‘the observation [_{CP} that dolphins have returned to the region]’). Most of the vast previous literature on nominalizations has focused on eventive and referring/result readings. In extending the allosemy analysis of Icelandic nominalizations from Wood (2023) to the German facts and to the content reading, I focus on the ways in which the content reading speaks to the link between embedded verbal structure, event interpretations, and argument-structural properties in nominalizations.

In **Chapter 4** I turn to preverbal elements in German, a class which I take to include inseparable prefixes, separable particles, and resultative secondary predicates. I argue that we can gain insights from looking at the co-occurrence restrictions on these three types of elements, as well as their effects on argument- and event structure as a three-way comparison, where most previous work has looked at prefixes and particles or particles and resultatives in pairs. I argue that the highly restricted ways in which these elements may combine follow from structural and semantic factors working in tandem, and as such illuminate locality restrictions on allosemy.

Finally, in **Chapter 5**, I combine the empirical domains of the previous chapters to ask what is re-

vealed about the structure and interpretation of morphologically complex words when we look at the nominalization of verbs with prefixes, particles, and RSPs. I focus in particular on comparing nominalized infinitives, *-ung*-nominalizations, and *Ge-* *-e*-nominalizations: All three form event nominals, but they are subject to distinct sets of restrictions. The chapter also contains some more general discussion of multiple derivation, and the ways in which morphologically complex forms are sometimes easier targets for further derivation than their simplex counterparts (cf. **Arbeit-ung* but *Be-arbeit-ung* ('operation, edit')) and other times do not allow the 'stacking' of multiple (categorizing or otherwise derivational) morphemes in the syntax, as is already apparent from the previous case study.

In addition to their potential contributions to the questions sketched above, I also believe that these case studies can shed further light on **(Q3)**, which could be considered a more traditionally 'morphological' question about the relationship between syntactic structure and exponents in a realizational theory:

(5) **Q3:** How are categorizers (*v, n, ..*) related to exponents of nominalizers, verbalizers, etc.?

My overarching goal is that this dissertation should address issues in derivational morphology from various perspectives, taking into account the structure, form, and meaning rather than focusing on one (or two) of the three, even where this comes at the cost of taking complete and consistent analyses out of (my) reach.

Derivational morphology is known to be messy: "*We are dealing with derivational morphology, where no constraint is absolute*", write Aronoff and Fuhrhop (2002: p. 470) in their paper on the limits of multiple derivation in German (cf. chapter 5), and this sentiment is widely shared among researchers. But equally shared is the programmatic intuition that there is a method to the madness. As Bierwisch (1990: p. 55) puts it, "*what shows up at the surface as a fuzzy domain of semi-predictability bothering research in word formation, must be explained in terms of the different factors involved, which then are likely to exhibit a great deal of systematicity, constraining specific idiosyncrasies.*" In other words, to do this kind of research requires a commitment to the idea that the investigation of constraints and factors and systems that might be at work is worth it, even if we cannot expect to fully disentangle them. In the course of writing this dissertation, I have come to believe that researchers in derivational morphology are just faced

with the regular competing pressures of over- and under-generalization in an especially pronounced and inescapable way.

1.2 ROOTS AND CATEGORIZERS

The theory of word formation that underlies the questions and assumptions in this dissertation has a range of properties, some unique, many shared by other frameworks, that warrant some expository remarks before we get into the specifics.

Questions about derivational morphology have often been relegated to a *lexicon* component of the grammar. The lexicon is a complex and varied concept; for present purposes, it is useful to think of it as a hypothesis about the *locus and principles* of word formation, and, relatedly, an explanation for the *particularity* of words in form and meaning composition (compared to other linguistic objects that are not built or contained in the lexicon). Theories with a lexicon hold that words are a special domain of form (the domain of *allomorphy*, perhaps also of word-level phonological processes), as well as of meaning, with word meanings thought to be composed through separate principles, (perhaps, more idiosyncratically and opaquely than sentence meaning), or not decomposable at all.

Conversely, *syntactic* theories of word formation reject the lexicon (in the sense above), and with it the hypothesis that words are built in a fundamentally different way from sentences. Embick (2021) outlines the importance of category-neutral Roots and separate syntactic categorizers for Distributed Morphology. Embick traces this line of thought back to Chomsky (1970) and the introduction of the \bar{X} -Schema. Unlike earlier transformational theories, the \bar{X} -Schema by design divorces the category of a lexical item from its distribution in the syntax. For that reason, Chomsky conceptualizes category-neutral lexical items such as DESTROY, which ‘become’ a noun or a verb by being inserted below a syntactic head with category features [+N -V] or [-N +V]. As Embick discusses in detail, this mechanism could be taken to involve Roots and syntactic categorizers, but theoretical developments in the immediate aftermath of *Remarks* instead developed the notion that word-formation is fundamentally non-syntactic and takes place in the lexicon (in the sense of the previous paragraph). Marantz (1995, 1997) recasts the spotlight

on Chomsky's argument to be mainly about the syntactic relatedness of *destroy* and *destruction* on the one hand (and *grow* and *growth* on the other). This argument focuses on agent-licensing and has since undergone further development, especially with the introduction of a separate Voice head (cf. Kratzer 1996, and some discussion in the next chapter). From Marantz' perspective, the famous examples in (6) show that agents in the verbal domain are licensed syntactically (by *v*, later Voice),¹ while in the syntactic context of nominalizations, where there is no such verbal licenser of the agent, Root semantics become the deciding factor.

- (6) a. John destroyed the city
 b. John's destruction of the city
 c. John grows tomatoes
 d. *John's growth of tomatoes

$\sqrt{\text{DESTROY}}$, which is not internally caused, by implication allows an agentive interpretation of the external argument even in the nominalization, while $\sqrt{\text{GROW}}$, which *is* internally caused, cannot license the agent, instead requiring it to be licensed by Voice. Accepting to move away from the lexicon and toward a syntactic theory of derivational morphology on the basis of these facts could seem like a bit of a leap – strikingly, after all, the lexical semantics of different Root classes is important for the argument to go through. It's useful to stress that the reason that the ungrammaticality of (6d) has been so important for the development of the DM perspective on derivational morphology is the grammaticality of (6c). Under the lexicalist theory, (6c) shows that there is a *transitive* version of *grow* in the lexicon. Why, then, should this transitive verb fail to nominalize to yield 'transitive' *growth*?

From the start, DM as a theory of syntactic word formation developed as one of its primary concerns the question of *locality domains* on the meaning and especially on the form side (see Embick 2010 a.m.o). In some sense, the importance of locality arises immediately from the rejection of the lexicon itself, which, as I sketched above, provides an explanation for word-specific properties. While researchers in DM and related frameworks have generally rejected the idea that words as such have a special status

¹The examples reproduced here represent a snippet of the Chomsky-Marantz data for expository purposes.

(or indeed that they exist as objects in the theory at all), they have sought to maintain the idea that certain properties of form and meaning have to be conditioned locally, in a way that leverages the syntactic structure to make predictions about the kinds of semantic and morpho-phonological information that are available at any given point in the derivation of a given form.

Concerning allomorphy, the basic idea is that certain syntactic heads define cyclic domains in which Vocabulary Insertion applies to provide phonological content to the abstract morphemes. Many details remain contested, such as the size of the relevant domain, whether this process applies strictly bottom-up, strictly to one node at a time or by span, whether the relevant nodes are the same or potentially different from syntactic phase heads, and whether the phonological content is added to or replaces morpho-syntactic features.

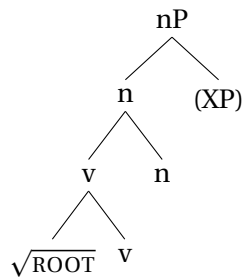
With further details depending on the answers to these questions, allomorphy in principle has at least two possible interpretations in Distributed Morphology, which are important to understand as conceptually different (cf. Embick 2016). The first is that different overt or zero allomorphs of e.g. n realize different n heads, such that in English $n_1=-al$, $n_2=-tion$, $n_3=-\emptyset$ and so on. The second option is that there is only one syntactic head n (or, to be precise, some set of ns not coextensive with the set of exponents), and that their realization is determined contextually, such that n is realized by different exponents depending on a context specification at Vocabulary Insertion. On this view, the mapping from syntax to morpho-phonology is one-to-many – the syntactic head has multiple exponents.

As I will discuss in more detail in the next chapter, many analogous issues arise on the meaning side, in the domain of *allosemy* (although I will also argue that the analogy with allomorphy has its limits). As mentioned in the previous subsection, a theory that assumes abstract morphemes in the syntax, which are supplied with phonological content that can be *conditioned by their context* over the course of the derivation, in principle lends itself to a similar mechanism at LF, whereby the abstract morphemes are also furnished with a denotation that may itself be conditioned by the morpheme's context as well. Allosemy implements this contextual dependence in the mapping to semantics. Instead of merging different 'flavors' of functional heads, different denotations are determined or inserted post-syntactically. The implications are the following: First, the semantic interpretation, but not the syntactic distribution, will

vary as different *allosemes* are employed (with implications for the syntax-semantics interface as I will show in the next section); and second, form and meaning will be dissociated: *n* has multiple interpretations at each interface, (correctly) predicting that the choice of allomorph and the choice of *alloseme* are independent of each other.

The recently mounting interest in *allosemy* connects to another development in the study of word formation that is equally relevant for this dissertation. Some of the most recent proposals in this area share the property that the proposed structures are *small* compared to previous or conceivable syntactic accounts of the same phenomena (Wood 2023; Paparounas 2023; Embick to appear; Biggs and Embick 2025). For example, the nominalization structures in Wood (2023) include a categorizer *v*, but not a phrasal *vP*, and no other verbal projections.

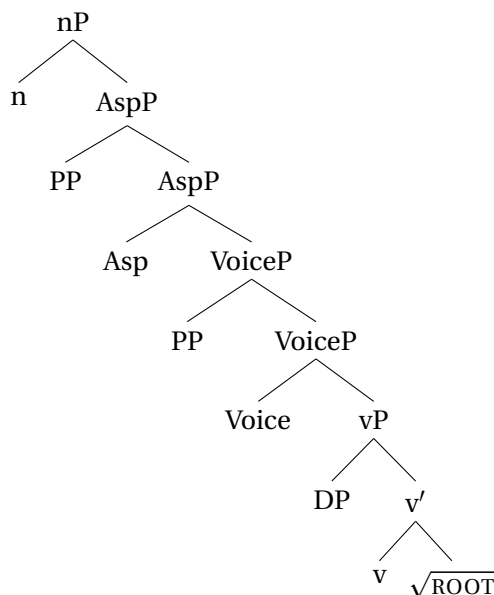
(7) ‘Small nP’, Wood (2023)



This is in stark contrast to previous proposals concerning the syntax of deverbal nominalizations, as an example, consider Alexiadou (2017) (and much related work), where it is argued that nominalizations in English can include verbal heads and their projections up to AspP.²

²Note that Alexiadou does not claim that this is the case across the board, (8) represents the maximal set of projections.

(8) ‘Large nP’, Alexiadou (2017)



The ‘small’ structures are in part made possible by the adoption of *allosemy* for functional heads, because a single syntactic terminal may have different semantic effects on the event and argument structure with which it is associated. Furthermore, under the assumption that allosemy is *local* in ways that are similar to allomorphy (or even the laxer assumption that there are any locality conditions at all on the meaning side, see chapter 2), adopting allosemy may also *necessitate* smaller syntactic structures, depending on the heads and Roots that are required to be visible to or affected by allosemy in a given domain.

I will return to the specific question of how much verbal structure there is in nominalizations in chapters 3 and 5, but there is also a more general point to keep in mind here. The development towards small structures opens the door to a more general attempt to *rein in* the power of syntactic word formation, where appropriate. There is a sense in which small structures retain the rejection of the lexicon, but concede that the syntax of this inner domain of form and meaning (by some measure of approximation, the word) is *not* exactly the same as clause-level syntax. The fundamental idea that is developed in this work is that certain interpretative idiosyncrasies in small structures are made possible precisely because the morphemes involved are close to one another (in ways to be made more precise).

With the dissertation, I hope to contribute to our understanding of the nature of small syntactic structures, and to explore whether allosemy is a plausible and appropriate theoretical tool that can inform theories of the complex form-meaning mappings in derivational morphology. To that end, the next chapter provides an overview of some of the previous work on allosemy, with special focus on the question of how it links to and is different from considerations in syntactic theory and lexical semantics. This overview provides a starting point for the discussion in the subsequent chapters.

2

ALLOSEMY

2.1	CONCEPTUALIZING ALLOSEMY	14
2.2	ALLOSEMY WITHIN CATEGORY	27
2.3	ALLOSEMY AND ARGUMENT STRUCTURE . . .	33
2.4	DOMAINS AND DIRECTIONALITY	37
2.5	CROSS-LINGUISTIC PATTERNS IN ALLOSEMY .	41
2.6	ON WHAT FOLLOWS	43

One of the concepts at the heart of this dissertation is *allosemy*. It is not a new observation that various aspects of the semantic interpretation of syntactic constituents, words, and morphemes may vary depending on their syntactic context, nor is it unique to Distributed Morphology, or even to linguistics as a field. Nonetheless, there is a sense in which allosemy, under that name and in its implementations in current theorizing, is a new concept. Consequently, our understanding of allosemy is still in flux, and it is worth spending some time on the question of how and why allosemy has come to be a part of the theory in DM in particular, the sense in which the term represents an empirical phenomenon, and the

logically separate sense in which it represents a theoretical tool. This chapter is intended to capture some thoughts about whether we want this tool at all, what it has so far been used for, and what it might be used for in the future. Beyond DM as a theory of word formation at the interfaces, looking at allosemy in this way also allows us to understand more about where it stands in a tradition of assigning meaning to parts of complex words and to (sequences of) functional heads alike, and how this speaks to our understanding of the domains of meaning composition in terms of conceptual meaning (traditionally the domain of lexical semantics), and formal, model theoretic semantics.

This chapter serves in part as a survey of the previous literature on allosemy, but also contains some of my own findings and speculations on the questions sketched above. One of the goals is to categorize previous proposals along several dimensions. As we will see, allosemy for Roots has been assumed in the framework almost from the start, although implementations have varied and have rarely been labeled as allosemy until quite recently. The application of allosemy to functional heads is also quite recent, though again not without important precursors. The term ‘allosemy’ and its application to both Roots and functional heads are frequently thought of in analogy to the well-established term ‘allomorphy’. As we will see in more detail below, the analogy assumes that the syntax-LF interface may be subject to a one-to-many correspondence relation, just as we may conceive of allomorphy as a one-to-many correspondence relation at PF. The fact that this is only one possible view of allomorphy at PF will also point us to some of the limits of the analogy.

2.1 CONCEPTUALIZING ALLOSEMY

There are at least two ways to make an initial approach to understanding allosemy, the first empirical, the second architectural. Since the empirical way is less theory-dependent, I will start there, in spite of the fact that arguments about allosemy are more often framed using the architectural approach. In my opinion, this tendency unnecessarily obscures the generality of the issues at stake.

2.1.1 TWO APPROACHES

The empirical approach consists simply in observing that a wide range of linguistic items have more than one interpretation depending on their context. First, there are classic cases of polysemy: in (9), the word *paper* has three easily distinguished and nonetheless obviously related interpretations.

- (9)
- | | | |
|----|---|------------------------|
| a. | My <i>paper</i> on coffee imports is on the table | <i>physical object</i> |
| b. | My <i>paper</i> on coffee imports convinced John to switch to green tea | <i>content</i> |
| c. | Louisa's coffee cup is made out of <i>paper</i> | <i>material</i> |

Note that while the study of this type of polysemy in its guise as a shift in conceptual meaning falls into the domain of study of philosophy and psychology, it's easily demonstrated that it is also grammatically relevant. For example, in the grammatical context of pluralization, the first two interpretations mentioned above are retained, the third is impossible (the material *paper* is a mass noun), and a new, related but specialized, meaning pops up, compare (10).

- (10) The officer asked for my *papers* *means of identification*

There are different ways to think about an example like (10). We could say that the Root $\sqrt{\text{PAPER}}$ has a special meaning that becomes accessible in the context of a feature [+pl] or similar. We could say that the suffixed plural word *paper-s* is assigned this special meaning as a unit (and then debate whether this make it an *idiom*, see the discussion below). We could, hypothetically, postulate that it is the plural morpheme with the exponent *-s* that receives the special meaning in the context of the Root $\sqrt{\text{PAPER}}$ (although it might be difficult to substantiate such an analysis).

Another well-known type of linguistically relevant polysemy concerns words that can appear in different syntactic categories, like *braid* in the examples below.

- (11)
- | | | |
|----|--|-------------|
| a. | I <i>braid</i> my sister's hair | <i>verb</i> |
| b. | My sister wears her hair in a <i>braid</i> | <i>noun</i> |

Regardless of whether such examples are analyzed as a noun derived from a verb, a verb derived from a noun, or both a verb and a noun derived from a common Root (cf. Levinson 2010, 2014 for discussion of this particular class of Roots), it is clear that the interpretations of *braid* in (11) are conceptually closely related, but grammatically distinct: one is syntactically distributed as a verb and semantically composes as a predicate of events, the other is found in the syntactic position of a noun and interpreted as an entity. Again, we can ask whether one (or both) of those interpretations are inherent to the Root or contributed by the categorizer, and we can ask what that means for the interpretation we expect either of those elements to have ‘by themselves’ or in another syntactic context.³

As a third type of context-dependent variation in interpretation, consider instances of multiple derivation. The noun *globalization*, for example, is derived from the verb *globalize*, which is derived from the adjective *global*, which is derived from the noun *globe*.⁴ The embedded noun *globe* is polysemous in a way similar to what we saw above for *paper*.

- | | | | |
|------|----|--|------------------------|
| (12) | a. | I bought a big mirrored globe for the yard | <i>sphere</i> |
| | b. | The effects of this policy are felt around the globe | <i>the earth</i> |
| | c. | I have a globe in my office | <i>physical object</i> |

In the case of *globalization*, we may initially think of the space of possible interpretations as narrowing as the derivational morphology is added: the adjective *global*, for most speakers, means something like ‘pertaining to the earth’, and not, for instance, ‘sphere-shaped’ (cf. *globular*). The question then arises why the adjective picks out only a subset of the meanings that are associated with the noun. Furthermore, in this particular example, that one meaning of the adjective *global* is then preserved throughout the remainder of the word formation process: the verb *globalize* again only makes use of the ‘pertaining to the earth’ meaning of *global*, and in fact further narrows it to something like ‘make global in scope’. Finally, the noun *globalization* refers to the process or the result of the process denoted by the verb *globalize*. In that sense, the ‘narrowing’ logic is clear: for instance, while *-ation* derives nouns, this nom-

³Note that this question is conceptually (though not methodologically) distinct from whether we think that either Roots or categorizers ever *can* appear by themselves.

⁴Setting aside for the moment the issue of whether *global* is in fact denominal or Root-derived, cf. Embick (to appear).

inalizer cannot access or activate all of the nominal meanings enumerated in (12) (see Marantz 2013a; Embick to appear).

Consider in this light the well-studied polysemy of event-denoting nominalizations, such as *observation* in (13) (and *globalization* above).

- (13) a. The frequent *observation* of the night sky delighted the captain. *event*
 b. The captain's *observations* are on the table in his study. *physical object*

Since Grimshaw (1990), nominalizations of this type have played a particularly prominent role in the discussion of polysemy in its syntactic context. For Grimshaw and in an extensive literature since then, the primary question raised by these examples is whether the event-denoting meaning in (13a) is in some way related to the fact that *observation* is derived from the verb *observe*. This literature builds on the fact that the syntactic behavior of the nominalization is tied to the event reading in various ways – most importantly, it is widely argued that only event nominalizations introduce arguments (cf. *of the night sky* above), which has been argued to follow from their deverbal nature (such that the argument structure is essentially inherited from the verb, although technical implementations vary). We will return to event nominalizations in the next section and in chapter 3. But how do examples of the *observation* type fit into our emerging picture of context-dependent polysemy? They combine many of the properties of the other classes we have seen so far: they display systematic polysemy, like the *paper* case, they involve the syntactic properties of multiple categories (verbs and nouns), like the *braid* case, potentially a directional change in category, like *globalization*, and, like all the previous cases, they raise the question to what extent we expect the interpretations of derived words to contain the meaning of their component parts. This last question in particular is also illustrated by the kind of context-dependent interpretation that we find in semantically non-transparent prefixed verbs, such as *under-stand* or *for-give*. In cases such as these, it appears that the derivational morphology (here: the prefixes) comes with a more dramatic change in meaning than was the case for the phenomena that we have surveyed up to this point. The meaning of *stand* is not transparently preserved in *under-stand* (nor, for that matter, is the (locational)

meaning of *under*). It is an open question whether this kind of more intrusive change in meaning is qualitatively different from the more subtle shifts we have seen above, or is simply a matter of degree. I will return to this question in the next section and in chapter 4. As noted in Aronoff (1976), a crucial comparison involves verbs that have a prefix attach to a Root that has no distinguishable meaning ‘on its own’ at all, as in *per-mit* or *de-ceive*. In English, examples of this type are generally from the Latinate vocabulary, but analogous cases in German show that a similar pattern can also occur in the native vocabulary.

- (14) a. $\sqrt{\text{GLOBE}}$ interpreted in the context of *-al*
 b. $\sqrt{\text{STAND}}$ interpreted in the context of *under-*
 c. $\sqrt{\text{CEIVE}}$ interpreted in the context of *de-*
 d. $\sqrt{\text{GESS}}$ interpreted in the context of *ver-* (German *ver-gessen* ‘forget’, **gessen*)

The comparison in (14) illustrates how derivational morphology in particular can sharpen our thinking around questions of contextual interpretation. In all these cases, it is possible to formulate an intuition about the way in which derivational morphology influences Root interpretation, but that intuition is not necessarily the same across these cases: As discussed above, in the case of *global*, we might say that the interpretation of the Root is fixed or narrowed down by the addition of the derivational morpheme. In the case of *understand*, on the other hand, we might say that the interpretation of the Root *changes* in the context of the prefix: if *stand* points to some part of the meaning space, *understand* points to a different one. Finally, in cases like *deceive* or *vergessen*, it is *only* in the context of a prefix that we can assign any meaning to the Root at all. Several factors could be argued to be at work in explaining the range of intuitively different effects of the derivational morphemes in (14). One crucial difference between *-al* on the one hand and prefixes on the other is that *-al* is the exponent of a categorizer *a*; categorizers have been argued to play a special role in determining Root meanings (see e.g. Arad 2003; Marantz 2013a). I will return to this comparison at several points throughout the dissertation, the point to keep in mind is simply this: It is not obvious whether contextual interpretation of Roots can be characterized as a unified phenomenon.

Another type of phenomenon that raises the question of whether different context-dependent in-

terpretations are different in kind or in degree concerns functional morphemes that are also subject to context-dependent interpretations. Many examples of this type are significantly less theory-independent than the examples of Root interpretation, but take as an initial illustration the many interpretations of *have* in (15) (examples from Myler 2016).

- | | | |
|------|------------------------------------|-------------------|
| (15) | a. John has a Playstation 3 | <i>ownership</i> |
| | b. John has a sister | <i>kinship</i> |
| | c. John has blue eyes | <i>body part</i> |
| | d. This table has four sturdy legs | <i>part-whole</i> |
| | e. ... | |

As Myler (2016) discusses in detail, English *have* and many equivalents cross-linguistically pose what he refers to as the *too-many-meanings puzzle*. In particular, the relation that *have* encodes appears to crucially depend on the conceptual relationship between possessor and possessee. The conclusion that this involves some mechanism of context-dependent interpretation is fairly independent of the particulars: whether it is *have* itself or some other part of the structures in (15) that varies in meaning, it is clear that the polysemy is connected to some functional part of the structure. It is also evident that in spite of this, these cases share a crucial property with the others we have examined in this section: we again find that a particular interpretation systematically emerges from a set of conceptually related options in a specific syntactic context.

A final class of context-dependent interpretations that is worth mentioning in this initial overview is presented by *idioms*, a small selection of which is given in (16).

- | | | |
|------|--------------------|-----------------------------------|
| (16) | a. kick the bucket | <i>to die</i> |
| | b. a piece of cake | <i>easy</i> |
| | c. bite the bullet | <i>to make a dreaded decision</i> |

However, for reasons that will be discussed in section 2.1.2, idioms are qualitatively different from at

least some other cases of context-dependent interpretations discussed above. This will lead us to exclude them from consideration for allosemy despite the fact that they do of course meet the surface-level criterion of ‘special interpretation in context’. Another phenomenon that needs to be excluded from consideration in spite of meeting that criterion is *homophony*, discussion of which I also postpone to section 2.1.2.

While our ability to define allosemy or the phenomena to which it is relevant without referencing a theory of morphosyntax is limited in obvious ways, note that only two conditions have to hold in order for a concept like allosemy to become relevant in the description of a given alternation in interpretation. First, it has to be true that the alternation in meaning is linguistically relevant. There are some cases of meaning alternations that might be argued to be purely conceptual, especially in the realm of lexical meaning. Second, it has to be true that the alternation is not a case of narrow-sense idiomaticity or homophony, as mentioned briefly above and discussed in more detail below. Neither one of these conditions is trivial, but it should also be clear that *some* empirical phenomena will pass these tests within many different research traditions in linguistics.

As mentioned at the beginning of this section, the second approach to allosemy is an architectural one, arguing in essence that allosemy *should* exist in a theory of grammar that assumes that abstract syntactic morphemes are interpreted at the interfaces. The only additional assumption that is needed to predict allosemic effects in this type of theory is that the mapping from syntactic morphemes to denotations or rules of interpretation at LF is sometimes one-to-many, as has long been assumed for the mapping from syntactic morphemes to exponents at PF. This line of argumentation stresses the symmetry of interpretation at the interfaces. The architectural approach holds that, all else equal, the architecture should make us expect an equivalent to allomorphy ‘on the meaning side’. Of course, whether all else *is* equal is, as always, a valid question, one to which I will return at several points in what follows.

Of course, the empirical and architectural approach are more closely linked than it may initially appear: which meaning alternation phenomena are expected to fall under the term ‘allosemy’ is strongly influenced by the theoretical assumptions that are made about the theory of grammar as a whole. Conversely, I called the idea that there are ‘one-to-many’ mappings at LF an assumption above, but it is an

assumption with an empirical component. For example, as we will see below, alloosemy has been employed to make sense of the fact that the so-called *flavors* of ν are not tracked by the exponents of ν in English: Without alloosemy, one has to assume that all flavors accidentally spell out using the same set of exponents (*-ize, -ify, -ate*, cf. Harley 2009).⁵ Nevertheless, the influential idea that alloosemy is in some way analogous to allomorphy is especially pronounced within the architectural approach. Under the architectural approach, we expect the type of phenomena, and potentially the locality domains of alloosemy, to directly mirror allomorphy. A clear example of this kind of reasoning can be found in Marantz (2013a). According to Marantz, contextual interpretation at both interfaces is the natural prediction of a framework that crucially posits abstract morphemes in the syntax:

- (17) *‘Surely, “abstract” morphemes are as abstract with respect to semantics as they are with respect to phonology; if morphemes in the syntax were semantically concrete, we would identify them by their semantic content in the syntax rather than by their grammatical features.’ (Marantz 2013a: p. 97)*

The idea that the architecture of the grammar should be so symmetrical as to allow contextual interpretation at both interfaces, confined to the same locality domains, and accounting for conceptually parallel phenomena, is immediately attractive, but it also raises obvious questions: What, for example, qualifies as conceptually parallel – that is, what do we expect the ‘meaning side’-equivalent of allomorphy to look like in the first place, and are those expectations borne out by the kinds of phenomena in alternating interpretation discussed above?

From the architectural perspective, we are looking for alternations in interpretation that do not go hand in hand with overtly different exponents, or, to be more precise, do not go hand in hand with separate abstract syntactic morphemes that are motivated for some independent reason. This difference is an important and yet quite complicated one and is worth spelling out in a little more detail. To appreciate this difference, it is useful to first return to the notion that such meaning alternations can in principle

⁵I thank Jim Wood (p.c.) for discussion on this point.

involve any kind of morpheme, functional heads or Roots.⁶

For Roots, the question of whether we are dealing with separate abstract morphemes or not arises in a very particular way. Whether Roots are inherently associated with a constant form and/or meaning component are long-standing question within DM and related frameworks (see Embick 2021 for the importance of considering the motivating factors in positing Roots in the first place in the context of these discussions). For present purposes, there is no viable alternative to considering Root allosemy on the basis of (partial) identity in form:⁷ the hypothetical alternative, were we to consider whether Roots show allosemy independently of identity in form, is completely intractable.⁸

For functional heads, the situation presents itself differently. Consider as an example Marantz's (2013a, 2013b) discussion of the lack of an overt alternation or stacking relationship between different ν heads in lexical causatives cross-linguistically. In English transitive *open the door*, the meaning components typically attributed to little ν (as part of the event structure) include both CAUSE and BECOME, with only the latter also present in the inchoative *the door opened*. This kind of alternation has typically been captured within DM as an alternation of different flavors of ν (see e.g. Folli and Harley 2005; Harley 2009). Flavors are understood to be separate syntactic heads, typically bearing subscripts to distinguish them (i.e. ν_{cause} , ν_{become} or similar). The flavor approach can explain why some verbs participates in alternations like the causative alternation (under the assumption that only some Roots can appear with a given set of flavors of ν). However, as Marantz argues, this kind of approach does not explain why we do not find stacked ν exponents or evidence for a more complex syntactic structure in the transitive (more complex structures are instead reserved for syntactic causatives), nor why the set of exponents of ν is the same across different flavors in English (as discussed above), nor why languages sometimes overtly mark causatives or inchoatives, but not both. Instead, the interaction of ν with Voice has been argued to suggest that both alternants in the causative alternation feature the same ν syntactically (cf. Alexiadou et al.

⁶It could also involve a syntactic structure that consist of multiple morphemes, and we will in fact see that this possibility is arguably instantiated, but note for present purposes that any such process of allosemy for complex syntactic structure still involves allosemy for functional heads and/or Roots.

⁷The qualifier 'partial' here is meant to include the possibility of morpho-phonological processes applying, but exclude Root suppletion.

⁸Light verbs, to the extent that they involve Roots, may be an exception.

2015; Schäfer 2024; Wood and Marantz 2017). In contrast, on an allosemy analysis of this alternation, there is only one abstract syntactic ν , which may be interpreted as CAUSE or BECOME at LF, and may receive maximally one overt exponent at PF. Similar arguments have been advanced for Voice (including in the context of the causative alternation); I will return to the application of allosemy in theories of argument structure in section 2.3.

With the example of ν in hand, we can now return to the complication regarding the distinction between syntactic heads and their exponents alluded to above. The obvious starting point in investigations of allosemy are alternations that do not go hand in hand with separate overt exponents, either within a language or cross-linguistically (more on this latter distinction in section 2.5). In the case of ν in English, which is typically phonologically zero, this condition is trivially met.

However, as should be clear from our discussion of the architectural approach to allosemy above, this initial understanding of allosemy ignores a fundamental tenant of the kind of theory of the grammar under consideration here, namely that syntactic morphemes are abstract and do not necessarily correspond to exponents in a one-to-one fashion. Therefore, two or more overtly distinct exponents could still be traced back to one single abstract morpheme in the syntax, which could in turn receive multiple interpretations through allosemy. Crucially, this state of affairs does not make exponents irrelevant: in cases where a particular exponent and a particular interpretation travel together, we would still want to claim that this relationship is mediated by a distinct syntactic head. Nonetheless, the dissociation of exponents and syntactic heads on the one hand, and syntactic heads and interpretations on the other, does present a serious, and sometimes underappreciated, complication for research in allosemy: unlike in the case of allomorphy, this research can require identifying whether two levels of representation co-vary, neither of which we can observe directly. It becomes all the more important to distinguish the types of phenomena that involve allosemy from the ones that do not. This requires moving beyond the simple criterion of ‘alternating interpretations in context’ that I applied in explaining the empirical approach to allosemy, and towards a view that is consistent with some set of theoretical assumptions. As Marantz (2013a) and Marantz and Myler (to appear) argue, particularly important distinctions involve homophony and idiomaticity.

2.1.2 EXCLUDING HOMOPHONY AND IDIOMS

The distinction between homophony and polysemy has a long research tradition of its own, including in experimental work (cf. Simon et al. 2012 and references therein), but it is relevant here mainly for a conceptual reason. We will maintain the standard distinction, holding that homophony involves *two* words or morphemes that are pronounced the same but have unrelated meanings (meaning that they sound the same ‘accidentally’), whereas polysemy involves *one* word or morpheme that can have multiple related meanings. We have already seen that positing two or more homophonous Roots, affixes, words, or syntactic structures can be a competing analysis to an allosemy analysis. This is the case, for example, for an analysis that posits multiple syntactic flavors of *v* that end up receiving the same exponent. Similarly, it is in principle possible to analyze the event/referential reading ambiguity of nominalizations like *observation* by positing two (or more) homophonous nouns, one with an event reading and the ability to take arguments, and one (or more) with a referential reading. Alternatively, one could analyze this type of ambiguity as involving one Root, but homophonous affixes *-ation*, or distinct syntactic structures that are externalized homophonously (all of these analyses have in fact been proposed, see chapter 3 for discussion).

The other side of the same coin is equally relevant, though perhaps less obviously so: Because of the issues enumerated in the previous section concerning the determination of what meaning a Root in particular has ‘on its own’, it is in principle possible to conceive of an allosemy analysis of homophony involving unrelated Root meanings, for instance, of a noun like *bank*, which can refer to the side of a river or the financial institution, or *bat*, which can refer to the nocturnal animal or the baseball implement. This analytical decision would take seriously the idea that whenever two morphemes or words have the same morpho-phonological form and the same syntax (here, importantly, the same category), but two or more distinct meanings, those meanings arise through Root allosemy. However, it should also be apparent that nothing about admitting contextual interpretation into the grammar forces the conclusion that homophonous words and morphemes do not simply exist as separate linguistic items or lexical entries, as has been standardly assumed. Following Marantz, I will assume that homophony is categorically

distinct from polysemy and should not be analyzed as contextual allosemy, although it is worth emphasizing (again following Marantz) that the distinction is by no means trivial, nor will it be obvious in every instance which analysis is to be preferred.

The second kind of phenomenon that contextual allosemy should crucially be distinguished from is idiomaticity (Anagnostopoulou & Samioti 2014; Marantz 2013a; Marantz & Myler *to appear*). This is a more subtle and perhaps more contentious point than the homophony distinction, but it is also arguably more important: while the question of whether any given instance of a form associated with multiple meanings should be analyzed as homophony or allosemy only affects the existence of allosemy under the extreme position that every single instance is in fact homophony, the existence of idioms raises a more serious challenge to the claim that a separate interpretative mechanism is needed for other kinds of idiosyncratic meanings.

Marantz and Myler (*to appear*) point to two different arguments against the idea that allosemy can be subsumed under idiom formation. The first is that idioms do not obey the same locality restrictions as allosemy. This is a somewhat difficult argument to substantiate conclusively given that research into the locality of allosemy is still at a very early stage (more on this in section 2.4.1). While it is frequently assumed that the domains of allomorphy and allosemy should match up (for architectural reasons as sketched above), the merit of this assumption has rarely been evaluated independently, and in any case faces the issue that there is no fixed consensus on the locality domains relevant for allomorphy either (see in particular Harðarson 2021 for a comparison of different proposals as applied to compounding that crucially relies on evidence from both allomorphy and allosemy). Nonetheless, it should be clear that as long as some relatively local context is ultimately established as the domain of allosemy, the argument from Marantz and Myler (*to appear*) will hold. Crucially for this first argument, idiom interpretation has been argued to be possible in a relatively large domain, subject to a clause-level limit at the Voice level (see e.g. Marantz 1995, 1997; Anagnostopoulou and Samioti 2014). Thus, as long as the domain of idiom interpretation is demonstrably larger than the domain of allosemy, this argument carries some weight.

The second argument for the distinct nature of contextual allosemy as compared to idiomatic interpretation is more straightforward: as Marantz and Myler (*to appear*) point out, idioms always have a

literal interpretation,⁹ while allosemy frequently enforces a specific special interpretation of a given Root or functional head, to the exclusion of the default interpretation or any other interpretation.

- (18) a. He kicked the bucket
 ✓idiomatic: He died
 ✓literal: He kicked the bucket
- b. He understood
 ✓allosemic: He understood
 ✗‘literal’
- c. The observations were on the table
 ✓allosemic: The observations_{Referential} were on the table
 ✗‘literal’

Of course, this is not to say that allosemically interpreted Roots or heads are never ambiguous. The absence of an interpretation that could be characterized as ‘literal’ merely indicates that there exist instances of contextual interpretation that do not look like idioms in various ways. We will assume that they therefore should not receive the same kind of analysis.

The following table summarizes some of the discussion in this section. It is important to stress that the claim is not that every case that descriptively involves one of the phenomena in the left column of the table is necessarily best analyzed as involving allosemy. Instead, the table represents a starting point for deciding whether such an analysis is possible within the confines of the framework as so far determined. It may well turn out that the scope of allosemy should be narrowed considerably (or expanded to cover different types of phenomena from the ones considered so far).

With this set of preliminaries and recurring questions in mind, sections 2.2 and 2.3 recapitulate some findings in the two areas that have been most extensively researched so far: allosemy within category, and the role of allosemy in theories of argument structure. Throughout these sections, I will attempt to

⁹A potential caveat concerns words that have been argued to appear exclusively in idioms, cf. Harley’s 2014 *caboodle*-items. Whether this caveat is necessary depends on the correct analysis of such items and the phrases in which they appear.

	allosemy analysis possible?
homophony	X
grammatically relevant polysemy within type	✓
type-shifting categorization	✓
derivational morphology leading to shift in meaning	✓
derivational morphology leading to non-transparent meaning	✓
head X interpreted in subset of syntactic contexts	✓
idioms	X

Table 1: Potential applications of contextual allosemy.

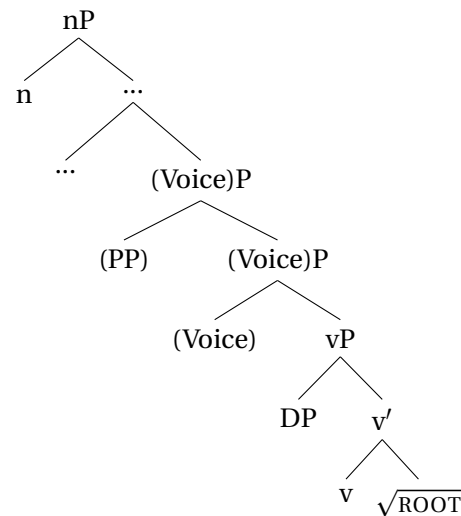
highlight points of both emerging consensus and lack thereof, and foreshadow some of the results from the remainder of the dissertation as they pertain to these issues.

2.2 ALLOSEMY WITHIN CATEGORY

A growing body of research has utilized allosemy to discuss phenomena that are characterized by differences in interpretation that are not accompanied by syntactically distinct categorizers.

An extensive and systematic proposal of this kind is advanced in Wood (2023). Wood argues that assuming contextual allosemy for functional heads like *v* and *n* as well as for Roots allows an analysis of deverbal nominalizations in Icelandic (and beyond) that captures core insights of syntactic analyses of such nominalizations without forcing the conclusion that eventive and non-eventive nominalizations have different syntactic structures. Recall from the introduction that the fact that deverbal nominalizations such as *observation* under the event reading are associated with argument structure has led some researchers to analyze such nouns as containing several phrasal projections from the verbal domain (Alexiadou 2001; Borer 2013; Fu et al. 2001; Roßdeutscher and Kamp 2010 a.o.). The analytical intuition is that those verbal projections are responsible for both the eventive interpretation and argument structure: eventive deverbal nominalizations behave like verbs in those regards because they are verbs until fairly late in their derivational life.

(19) 'Large nP' in deverbal nominalizations, schematically

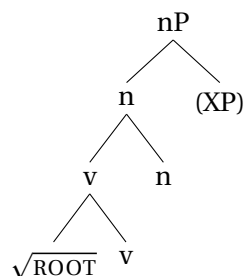


The success of this family of analyses lies in the fact that they straightforwardly explain why some verbal properties are 'inherited' by deverbal nominalizations. However, as Wood argues, such analyses make some (morpho-)syntactic predictions that are not borne out in languages like Icelandic and English. As will be discussed in more detail in chapter 3, they predict that deverbal nominalizations should show the hallmarks of their embedded verbal extended projections more broadly, e.g. in terms of adverbial modification or case assignment. For example, the presence of a *vP* projection in (19) a priori predicts that adverbial *vP* modifiers like *suddenly* should be available in the nominal domain, contrary to fact (cf. Chomsky 1970: p. 29 for a related comment, and Fu et al. 2001 for the opposite empirical claim).

- (20) a. The captain suddenly observed a disturbance in the water
 b. The captain's (*suddenly) observation (*suddenly) of a disturbance in the water (*suddenly)

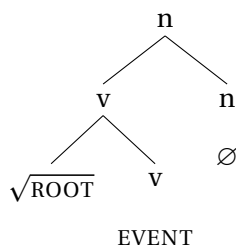
Wood argues that such predictions are avoided if all readings of a deverbal nominalizations involve a structure as in (21):

(21) ‘Small nP’, Wood (2023)

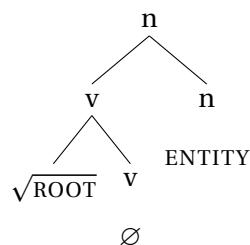


The structure in (21) disallows adverbial modification within nominalizations because there is no phrasal verbal projection that such modification could target, and it does not predict case assignment in the nominal domain to be inherited from the verbal domain, because no arguments are predicted to receive case prior to nominalization. It does however preserve a crucial prediction of the family of analyses represented in (20): eventive nominalizations structurally contain a verbalized Root, predicting that such nominalizations are transparently deverbal (i.e., contain an existing verb with the same meaning). This prediction corresponds to what Wood (2023) refers to as Borer’s Generalization, and explains why only deverbal nominals such as *observation* (and not simple nouns like *table* or *cat*) show the eventive interpretation and argument structural properties associated with so-called Complex Event Nominalizations (CENs). Wood’s crucial insight is that the CEN behavior of such nominalizations follows not from whether verbal structure is syntactically present or absent, but from whether v in (21) is semantically interpreted. The structures in (22) show this analysis in outline.

(22) a. eventive reading (CEN)



b. referential reading (RN)

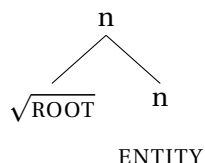


For a noun like *observation*, the idea is that the eventive reading follows from the structure in (22a), in which v is interpreted just as it would be in the verbal domain. Outwardly, *observation* distributes

as a noun syntactically because of n , but n does not contribute to its interpretation. For the referential reading of *observation* in (22b), on the other hand, it is ν that receives no semantic interpretation (a zero alloseme is chosen). The Root is therefore interpreted in the context of a contentful alloseme of n , and the nominalization receives the referential interpretation.¹⁰ A crucial aspect of this proposal is that eventive ν introduces a semantic requirement for a *Theme* alongside the event, accounting for the argument-structural difference between CENs and RNs. This component of the analysis reflects the broader application of allosemy in theories of argument structure in particular, which is discussed in more detail in section 2.3.

For present purposes, this sketch of Wood's (2023) proposal allows us to make the following observations about allosemy within category. First, note that the analysis partially dissociates the syntactic category of nominalizations (n across the board) from their interpretative properties. Eventive nominalizations are interpreted as eventive (and require Themes) because ν is semantically interpreted as it would be in the verbal domain, while n is semantically vacuous, and vice versa for the referential reading. Several complications arise concerning this basically symmetric proposal: As Wood discusses in chapter 6, syntactically as well as morphologically, we have much stronger evidence for the presence of n in (22a) than we do for ν in (22b). At least in cases where there is no overt verbalizer, RN readings could just as well involve no ν at all (n would consequently be Root-attached), as in (23).

(23) Root-attached referential reading (RN)



On the other hand, the fact that nominalizations *with* overt verbalizers can receive RN readings (cf. Alexiadou 2009; Harley 2009) does suggest that something like (23b) must be available.

¹⁰Wood (2023) also argues for the structure in (22b) for so-called Simple Event Nominalizations (SENs), with a different alloseme of n responsible for their interpretation (ν receives the zero alloseme as in RNs). Because the status of SENs is disputed within the nominalization literature, and somewhat of a complication to the divide between eventive and non-eventive readings, I set it aside here for expository purposes, but see some discussion in chapter 3.

(24) the organ-iz_{*ν*}-ation_{*n*} was founded in 1990

RN

Nonetheless, this complication points to a more general concern that work on allosemy must take seriously: while an item that is demonstrably present syntactically may go uninterpreted in a given context, this rationale clearly should not be extended to allow the postulation of otherwise unmotivated syntactic elements.

Relatedly, as was mentioned in the previous section, analyses in terms of allosemy frequently make claims that we can think of as the attribution of various aspects of meaning to specific parts of the syntactic structure. This, however, is an undertaking that is complicated at best, and, in some cases, simply impossible. Reconsider, for example, the claim that the eventive part of the eventive reading of a nominalization is contributed by *ν*. As discussed above, this is reasonable assumption, in that it explains why this meaning is shared between verbs and deverbal nominalizations. However, as Wood acknowledges, this does not by itself explain why a Root like $\sqrt{\text{OBSERVE}}$ or $\sqrt{\text{DRIVE}}$ is more compatible with eventive *ν* than $\sqrt{\text{BEAK}}$ or $\sqrt{\text{CAT}}$, even in a language like English with relatively flexible category affiliation (also compare Asher 2011; Levinson 2014; Pross 2019 for relevant discussion). There are technical solutions to this problem, such as specifying Roots for sets of semantic types that they will be content to denote, or relying on (extra-grammatical) filters to weed out conceptually implausible combinations. In this work, I do not adjudicate between these options, but I take this issue to indicate that the granular attribution of specific components of interpretation to specific parts of the structure, especially ones that can never be decontextualized according to the theory, should be undertaken cautiously and skeptically.

Finally, note that Wood's analysis also makes strong cross-linguistic predictions:¹¹ the systematic polysemy of deverbal nominalizations emerges from their general structure. This is because the eventive interpretation features the same alloseme of *ν* that is independently required in the verbal domain, and the referential interpretation features a zero alloseme of *ν*, which is also a very general option (arguably trivially). We might take this to be a claim about the kind of phenomena that allosemy produces (roughly, phenomena that involve non-interpretation of certain syntactic terminals, or interpretations

¹¹For languages that utilize the same basic syntax for nominalizations, as Wood is careful to note, this is not necessarily universally the case, cf. Šereikaitė (2024) on Lithuanian.

that are independently posited in other syntactic contexts). This intuition is also present, for example, in the extensive work on Voice allosemy (see next section). Interestingly, the literature on allosemy within category has also referenced the opposite intuition: Several recent studies propose to handle highly exceptional, non-general meaning alternations by means of allosemy. For example, Hopperdietzel (2024) proposes an allosemy analysis of manner and result readings of certain Roots in the Oceanic language Daakaka that initially seem to violate the well-known principle of manner/result complementarity (see e.g. Rappaport Hovav and Levin 2010).

- (25) a. Bong ma **tiwi-ye** pwesyete
 Bong REAL press.manually-TR branch DEM
 ‘Bong pressed the bench manually’
- b. Bong ma ta **tiwi-ye** pwesyete
 Bong REAL cut.INTR break-TR branch DEM
 ‘Bong broke the branch by cutting it’
- (Hopperdietzel 2024: p. 274)

As Hopperdietzel argues, while these Roots are exceptional in allowing either the manner or result reading, they only ever receive one of the two in any given syntactic context. He proposes that this follows from combining two assumptions: First, that manner and result Roots are merged in syntactically distinct positions (manner Roots as modifiers, result Roots as complements), and secondly, crucially for our purposes, that only a small set of Roots have both a manner and a result alloseme and can therefore occur in both positions (this set including English $\sqrt{\text{CUT}}$ and $\sqrt{\text{CLEAN}}$ and Daakaka $\sqrt{\text{TIWI}}$ as in the example above). This case study connects to the discussion above in two ways. First, it again highlights the issue of connecting Root ontology to effects of contextual interpretation, much as we saw above in the discussion of Roots in deverbal nominalizations. However, the details of this analysis are very different in an important way: while Wood’s discussion of nominalizations emphasizes the generality of the allosemes of e.g. *v*, Hopperdietzel’s discussion of manner/result complementarity crucially relies on the exceptionality of Roots with a manner *and* a result alloseme.

Crucially, the question of how general we take processes of allosemy to be is separate from the question of how transparent the meaning components involved in those processes are. The case study in

Hopperdietzel (2024) features highly transparent interpretative properties in exceptional contexts. As an example of the reverse situation, consider again non-transparent prefixed verbs. As we saw in section 2.1.1, prefixed verbs like *under-stand* or *de-ceive* receive non-transparent interpretations, either in that the meaning of the prefixed verb is not transparently related to the meaning of the corresponding simplex verb, or in that the simplex verb does not exist at all, thus has no meaning that the prefixed verb could be transparently related to. As we will see in chapter 4, this phenomenon is even more prevalent in German (see the examples in (26)).

- (26)
- a. ver-stehen, PFX-stand, ‘understand’
 - b. über-legen, PFX-lay, ‘think, consider’
 - c. be-nehmen, PFX-take, ‘behave’
 - d. an-fangen, PRT-catch, ‘start’

More generally, it is cross-linguistically common that prefixation in verbs causes non-transparent shifts in Root meaning. Prefixation, from this perspective, is a highly general context for contextual alternations in interpretation, while the resulting interpretations themselves are idiosyncratic and non-transparent.

Given these various dimensions along which applications of allosemy differ, even within category, it is perhaps not surprising that a particularly fruitful area of investigation has been the application of allosemy to theories of argument structure. Argument structure is an area in which both the contexts and the meaning alternations themselves have been argued to be highly general and systematic. In fact, it is arguably this very property that has led to argument structure as a crucial testing ground for hypotheses concerning the division of labor between syntax and semantics in the first place.

2.3 ALLOSEMY AND ARGUMENT STRUCTURE

The theory of argument structure has become a core area of achievement for the application of allosemy. I already briefly discussed Marantz’s (2013a, 2013b) argument for allosemy of *v* in lexical causatives in

section 2.1.1. Recall that a crucial aspect of that argument is that syntactic approaches with reference to multiple so-called flavors of ν predict morpho-syntactic distinctions that are not instantiated, such as stacked exponents of ν or full paradigms of alternating non-zero exponents. Similar considerations arise with respect to other syntactic heads involved in the introduction and interpretation of arguments, especially Voice. As argued in Wood (2015), Myler (2016), Kastner (2020), and Oikonomou and Alexiadou (2022) (also cf. Schäfer 2008; Alexiadou et al. 2015), the core syntactic property of Voice is whether it introduces an external argument in its specifier. For present purposes, it suffices to think of this as a binary distinction driven by a feature on Voice, such that $\text{Voice}_{\{D\}}$ introduces an argument and $\text{Voice}_{\{\}}$ does not (Wood 2015 a.o., but cf. Kastner 2020 for an argument that the distinction should be trivalent instead). However, as these author’s stress, there is reason to separate this syntactic dimension from the *interpretation* of Voice and the argument it introduces (if it introduces one at all). Going back to Kratzer (1996), it has been recognized that external arguments introduced by Voice can be interpreted as agents or stateholders. To account for this, Kratzer postulates two separate Voice heads with the denotations in (27).

- (27) a. $\llbracket \text{Voice}_{\text{Agent}} \rrbracket = \lambda x_e \lambda e_s [\text{agent}(x)(e)]$
 b. $\llbracket \text{Voice}_{\text{Holder}} \rrbracket = \lambda x_e \lambda s_s [\text{holder}(x)(e)]$

Kratzer (1996) takes the distribution of these Voice heads to be determined by the applicability of Event Identification between the denotation of Voice and the denotation of VP:

- (28) *‘What we cannot do, however, is combine the holder function with the denotation of an action predicate or the agent function with the denotation of a stative predicate.’* (Kratzer 1996: p. 123)

However, as the above quotation already indicates, and as is discussed by the authors cited, this means that the only interpretation of $\text{Voice}_{\{D\}}$ that is compatible with a given VP is determined by the interpretation of that VP. Thus, while $\text{Voice}_{\{D\}}$ must introduce a DP argument, the thematic interpretation of that argument can be left up to allosemy of Voice – the denotations in (27) correspond not to syntactically

separate heads, but to distinct allosemes of Voice, with the choice of alloseme contextually determined by the VP with which it combines.

The dissociation of the syntactic and semantic contributions of Voice has been shown to be helpful in accounting for multiple properties of Voice systems cross-linguistically, including the existence of marked anticausatives (cf. Schäfer 2008), syntactically distinct structures with parallel interpretations (cf. Wood 2015) and patterns of Voice syncretism (cf. Oikonomou and Alexiadou 2022). At this juncture, it is worthwhile to reflect again on the connection between arguments on identity in form and allosemic interpretation. As I have stressed throughout this review, identity in form by itself is not a forceful argument for allosemy in a theory that posits no direct correspondence between form and meaning at the level of the morpheme (i.e. a theory with abstract syntactic morphemes). However, the arguments that the works discussed in this section make with regards to identity in form are of a different kind: They claim that some parts of the morpho-syntax systematically fail to track some parts of the interpretation in a way that would be unexpected if the syntax featurally encoded the relevant differences in interpretation, such as e.g. thematic vs. expletive Voice.

Two related questions arise from these considerations: first, whether similar arguments can be made for heads other than Voice and v , and, secondly, whether the relegation of several argument-structural concerns to the interface, including event interpretation and the thematic interpretation of the event participants, affects the inventory of functional heads that should be posited in the syntax in the first place. Both of these questions have been answered in the affirmative in recent work on these issues. Based on the proposal in Wood (2015) that other heads like Appl and p are syntactically similar to Voice in that they either do or do not introduce an argument in their specifier (but both the heads and the arguments differ in interpretation according to their context, i.e. allosemically), Wood and Marantz (2017) suggest that positing a single syntactic argument-introducing head i^* suffices. On their account, DPs introduced by i^* receive different thematic interpretations dependent on the syntactic context of the i^* in question.

Given a generalized syntactic framework for argument-introduction along the lines of i^* , we may wonder how this speaks to argument-introduction in cross-category derivation, an issue that we have

izations under Wood's (2023) proposal as illustrated in the previous section. In particular, recall that for Wood, either ν or n can be semantically uninterpreted, resulting in referring or eventive readings, respectively. While one of the two does have to be interpreted in any given instance to determine the semantic type of the nominalization, the polysemy in some sense arises from optionality on this view: whether the choice of alloeme(s) will be compatible with a given environment is determined based on whether it ends up with a semantic type that can occur in the broader context. In Biggs and Embick's (2025) system, on the other hand, ν is crucially always interpreted, and alloemy of α is determined by the head immediately above. Whether these two views on alloemy of category-defining heads (and beyond) are both needed and compatible is an important issue for future research.

2.4 DOMAINS AND DIRECTIONALITY

The investigation of locality constraints and the directionality in the conditioning of special forms has been at the center of research on allomorphy in DM and arguably one of the empirical domains in which the basic assumptions of that theory have been most fruitfully employed. That is not to say that there is no disagreement about the details, contentious topics include whether Vocabulary Insertion (VI) applies to terminals or non-terminals (i.e. by *span*, Merchant 2015), whether it applies strictly bottom-up (Bobaljik 2000), how large the relevant cyclic domains are (Embick 2010; Moskal 2015), and the role of linear adjacency (Embick 2010). For the sake of comparison with domains of locality in alloemy, I will assume a view in which VI applies late (i.e. postsyntactically) for all heads but not necessarily for Roots, that it applies in a cyclic bottom-up fashion, with the spell-out of a cycle triggered by the next-higher cyclic head (the set of cyclic heads including category-defining heads) and that contextual allomorphy is understood as competition for insertion into a terminal node, conditioned by material in the same cycle and under linear adjacency.

It is, to my mind, an open question to what extent we expect the locality domains and directionality of alloemy to mirror allomorphy, especially given that there is not yet a consensus on the degree to which alloemy is accurately viewed as the meaning-side equivalent of allomorphy, as this overview

demonstrates. While I agree with Marantz (2013a), Marantz and Myler (to appear) that there is evidence of both cyclic locality and ‘linear’ adjacency playing a role in allosemy (the former from multiply derived complex words, the latter from semantic zeros, more on this below),¹³ the determination of the exact conditions must be an empirical one and should not be reduced to the claim that the locality conditions on allosemy will turn out to be the same as those on allomorphy, ‘whatever the outcome of this debate [on the locality conditions of allomorphy – JB]’ (Marantz & Myler to appear). That said, this empirical question is certainly a difficult one: As I have alluded to at various points in this chapter, it can be difficult to say which part of a given meaning originates in which part of a structure, especially if that meaning is context-dependent or not constant in some other way, as is the hallmark of allosemy. Naturally, this state of affairs vastly complicates the determination of locality conditions: If a given interpretative component cannot be attributed to a specific part of the structure, we also cannot determine what other material would have been able to locally condition that component. The question therefore arises to what extent locality conditions are relevant at all in the study of allosemy (assuming that relevance requires making testable predictions in some area). In the remainder of this section, I review the progress that has been made on this question. The following section addresses the validity of the analogy between allosemy and allomorphy in more general terms with a view towards cross-linguistic generalizations.

2.4.1 LOCALITY

Most explicit discussions of locality domains in allosemy have focused on the interpretation of Roots, and, in particular, on the domain in which the meaning of Roots in a given context becomes ‘fixed’ relative to its interpretation in other contexts. As proposed in e.g. Marantz (2001) and Arad (2003), we may assume that this occurs in the context of the initial categorizer of the Root (this is sometimes referred to as the *Marantz/Arad hypothesis*, cf. Anagnostopoulou and Samioti 2014; Kastner 2020). In understanding the consequences of this hypothesis, it is crucial to understand what is meant by ‘fixing’ the meaning in this context. As Marantz (2013a) discusses, the restriction has sometimes been taken to imply that the

¹³Linear adjacency at LF is probably best understood as referring to the situation in which two denotations compose, of course, this is not quite what we mean by linear adjacency at PF.

meaning of a multiply derived complex form has to be *predictable* from the meaning of the embedded word, but that is a misunderstanding. After all, the outer categorizer itself is predicted to be able to have an effect on the interpretation of the complex word, and the complex word could also be interpreted idiomatically. What should not be possible is that the outer category-defining head activates an entirely different meaning of the embedded Root, one that has been previously taken out of the running by the first categorizer. This would be the case if e.g. an adjective like *under-stand-able* appropriately modified a shelter-denoting noun: instead, *understandable* must retain the special interpretation of $\sqrt{\text{STAND}}$ in the context of the prefix and *v.* Marantz (2013a) refers to this as a ‘ban on flip-flopping’, meaning that the derivation cannot switch back to a previously excluded Root denotation. There is a complication worth mentioning in this context: while the appropriate locality condition may indeed rule out the *activation* of a previously discarded denotation, it is less clear that it also prevents the *re-introduction* of such a meaning. The extent to which this complication is of concern of course will depend on a theory of possible alloemes of a given head, as well as the correct delineation of idiom interpretation, as sketched in section 2.1.2.

At the same time, it remains true that the meaning of a Root in a given derivational context *does* become fixed in a local domain (regardless of how well this is predicted under the current theory). We saw this illustrated above with the example of complex adjectives like *understandable*, and I discuss the role of prefixation in particular in this connection in more detail in chapters 4 and 5.

Another aspect of this theory of locality concerns the possibility that some initial categorizers *fail* to fix the meaning of the Root by being semantically null. Like many proposals that we have surveyed in this chapter, this analysis is motivated by the corresponding effect in allomorphy, where phonologically null elements are typically assumed to be *pruned* and therefore fail to intervene for the purposes of choosing an allomorph (Embick 2010). Note that proposals of this type involve alloemy in more than one of the ways that we have enumerated here: first, there must be a zero alloeme of the categorizer, and secondly, this must enable a particular configuration of resolving alloemy on the Root at a later point in the derivation (i.e. upon interpretation of the first contentful alloeme of a cyclic head).

2.4.2 DIRECTIONALITY AND DEFAULTS

Alongside the locality domains themselves, there has also been some initial inquiry into the directionality of contextual allosemy (i.e., the direction in which allosemy can be conditioned), and into the existence of default or elsewhere allosemes (again in analogy to allomorphy).

As for directionality, the assumption that meaning is built cyclically from the bottom up (or from the Root outwards) could be taken to predict that allosemy for a given functional head can be conditioned by the semantics of a previously interpreted domain (below it) or by the syntactic features of the next higher head (above it). This prediction is rarely articulated explicitly in the literature (though cf. Wood 2015, 2016 for some discussion), but seems to fit quite well with many of the proposals that we have seen. For example, in the literature on allosemy of Voice, the crucial context is provided by the semantics of the VP, and in Biggs and Embick (2025), the crucial context is the syntactic head i^* directly above α .

A related issue, similarly rarely articulated explicitly, is the availability of an elsewhere or default alloseme in a given instance of allosemy. While we have seen that zero allosemes are frequently posited, this is typically a *special* case that leads to a particular interpretative configuration, and thus cannot be characterized as an elsewhere. An exception to this is the null alloseme of α in Biggs and Embick (2025), which occurs in the absence of a specific syntactic context. An explicit discussion of the availability of defaults is provided in Adamson (2025). Adamson argues that masculine gender on n in Greek can be interpreted as specifically *male* in the context of some Roots, but is otherwise interpreted as *animate* by default. Crucially, Adamson demonstrates that the default interpretation emerges when the Root-specific context is not available, such as in pronominal forms and in coordinated structures (where the gender feature is assumed to be resolved at the level of the coordination phrase and thus far away from a potentially allosemy-conditioning Root). Note that this analysis crucially and interestingly employs a non-zero elsewhere alloseme.

For Roots, on the other hand, the notion of an elsewhere alloseme is much more complicated. Following Embick and Marantz (2008), we assume that Roots are always categorized. While their interpretation can certainly vary depending on the categorizer(s) and other local morphemes, their interpretation

is thus never underdetermined by the context. Instead, in the absence of a suitable syntactic context for the interpretation of a given Root, the derivation should not converge at all, rather than settle for a default alloseme (though cf. Harley 2014; Wood 2016 on this point, where different conclusions are drawn regarding Root elsewhere). Whether this is implemented by selectional restrictions of the categorizers, the Roots, or some entirely different way is largely orthogonal to the topic of this dissertation, but I take it to be an important area for future research. For the same reason, there is something inherently imprecise in talking about allosemes of Roots at all (also see Carston 2024 on this point, and cf. Borer 2013, 2014), because that terminology implies that a list of such allosemes can be provided (and potentially be ordered by specificity, or include an elsewhere denotation). Note, however, that it does not follow from the fact that the ‘typical’ meaning of the Root cannot be isolated that Roots have no inherent meaning at all. In what follows, where I refer to *Root allosemy*, I always mean the interpretation of a Root *in context*.

2.5 CROSS-LINGUISTIC PATTERNS IN ALLOSEMY

As the previous sections have tacitly implied, arguments for allosemy frequently involve a cross-linguistic component, in that the lack of morpho-syntactic indication of different interpretations is considered to be especially amenable to an analysis in terms of allosemy if it is found across different languages. This is the case for example in polysemy in nominalizations of the type discussed in section 2.2, in that deverbal nominalizations are observed to have event and referential interpretations in many different languages. It is also the case for the type of argument structure alternation discussed in section 2.3, where the inventory of, say, different allosemes of Voice is clearly supposed to be constrained to a small and specific set, even if not all allosemes are available in every language (see e.g. Alexiadou et al. 2015 on the cross-linguistic availability of expletive Voice). Another example was discussed with respect to allosemes of α in the interpretation of passive participles, Biggs and Embick (2025) state explicitly that the strongest cross-linguistic hypothesis would be that α is always interpreted as stative in the relevant configuration (i.e., embedded under argument-introducing i^*). As discussed in section 2.2, however, this view, which takes the generality of the relevant interpretative components to be an important building block for a

theory of allosemy, is in competition with a second intuition, which takes *exceptional* interpretations to be particularly amenable to allosemy analyses (such as Roots that appear in manner and result contexts in Hopperdietzel 2024, or the emergence of an elsewhere interpretation of masculine gender features in a corner of Greek in Adamson 2025). These contradictory intuitions relate to different interpretations of what I have referred to as the *allomorphy analogy*. While much research in DM and beyond has targeted cross-linguistic generalizations about the *theory* of allomorphy, i.e. locality conditions and so on, the allomorphs themselves are of course highly language-specific. Do we expect the same language-specificity of allosemes, or can we strive for a restricted theory of the types of allosemes that may be available for a given head across languages?

For Roots, related questions arise in ways that are again only surface-similar to related questions on the PF side. In particular, we may wonder whether it is sensible to think of different Root meanings activated in specific contexts as the meaning-side equivalent of Root suppletion. On some level, this seems like a useful way to think about it, especially if it provided us with a principled way to distinguish *shifts* in Root meaning from the activation of unrelated meanings of the same Root (the former would then be handled by the meaning-side equivalent of readjustment). However, there is reason to proceed with caution: intuitively, Roots are far more flexible in meaning than they are in form. Furthermore, exploring hypotheses in this area in more detail would require a principled stance on the meaning that Roots share both within and across languages, a task that is impossible to undertake absent an explicit theory of lexical semantics and philosophy of language. Apparently, then, the allomorphy analogy has limits in its applicability to both heads and Roots.

It is important to think carefully about what these departures from the allomorphy analogy in the study of allosemy signify. At least three possibilities suggest themselves:

1. The allomorphy analogy is deeply flawed and should be abandoned entirely (it follows that any arguments about allosemy based on a parallel to allomorphy are invalid).
2. The breakdown of the allomorphy analogy shows that we are looking at the wrong set of phenomena under the label of allosemy: only those which behave more closely like ‘allomorphy on the

meaning side' should be admitted (it follows that many of the core instances of allosemy from the existing literature have to be excluded).

3. The allomorphy analogy holds in some crucial respects, but the relationship between abstract morphemes in the syntax and allosemy is fundamentally different from the relationship between such morphemes and their exponents (it follows that more research is required about the ways in which allosemy does and does not mirror allomorphy, and that the utility of the analogy is limited).

In my view, the questions surveyed in this chapter favor the third type of conclusion. Consequently, in the remainder of this dissertation, I try to stay away from invoking the analogy as a first principle, but do discuss real connections between the two domains where warranted.

2.6 ON WHAT FOLLOWS

This dissertation is not about polysemy, or about idioms, or even particularly about the meanings of Roots and affixes (although it may at times seem like it is). It is about examining the principal promise of allosemy as a tool in *syntactic* theory, which I take to be the promise that it allows insights into how the syntax may interact with various aspects of meaning without the syntax itself being imbued with semantic content. For this reason, the actual semantic content, both conceptual and formal, is often vague or simplified, sometimes frustratingly so: Not because it is irrelevant, but because for present purposes, what matters more is whether the aspect of meaning in question is visible, active, fixed, or mutable in its syntactic context, not what exactly that meaning *is*. I recognize that this methodological decision leaves the dissertation open to the line of criticism advanced in Lieber (2016, 2020), where it is argued that syntactic theories of derivational morphology have systematically failed to account for the full range of interpretations that morphologically complex words such as nominalizations can receive, at least in part due to a failure to keep conceptual meaning out of the denotations of the building blocks of complex words while also failing to embrace it (what Lieber refers to as 'conceptual leakage'). The response that I put forth in what follows is that the value of a syntactic theory of word formation 'on the meaning side' lies in circumscribing the domains and structural configurations in which those interpretations arise,

not in providing a theory of what the interpretations are. Of course, this dissertation does not accomplish this much smaller task either, it may not even be a step in the right direction. My hope is instead that this work may be useful in the ongoing process of determining what the right direction might be.

3

CONTENT NOMINALIZATIONS

3.1	INTRODUCING THE READINGS	47
3.2	THE SYNTAX AND INTERPRETATION OF DE- VERBAL NOMINALIZATIONS	51
3.3	SELECTING CP	56
3.4	LESSONS FROM THE CONTENT READING . . .	63
3.5	ALLOSEMY IN THE SELECTION OF CONTENT .	69
3.6	ALLOSEMY AND ONTOLOGY	76

In the investigation of nominalizations, especially since Grimshaw (1990), the systematic ambiguity of nominals like *observation* between an *event* reading (Complex Event Nominalization, CEN) and a *referring/result* reading (Referring/Result Nominalization, RN) has been a central issue.

- (30) a. The frequent *observation* of the night sky delighted the captain. CEN
b. The captain's *observations* are on the table in his study. RN

The two readings in (30) illustrate the core issue (A); the morphological picture is further complicated by issues (B) and (C):

- (A) Nominalizations are systematically ambiguous.¹⁴
- (B) Nominalizers can contribute meaning, but it is not the case that each specific nominalizer has a fixed meaning contribution.
- (C) Some Roots appear with more than one nominalizer, resulting in noninterchangeable derived nouns.

Together, (A-C) present a messy situation for form-meaning pairs in nominalization. In the context of these issues, consider that, for a subset of nominalizations, a third, less-studied, reading is available:

- (31) His *observation* that dolphins have returned to the region was confirmed by another ship. *Content*

Nominalizations like *observation* in (31), which I am here terming Complex Content Nominalizations (CCNs), are syntactically and semantically distinct from CENs and RNs, thereby putting new emphasis on the ambiguity problem in nominalization. For this reason, they can help in adjudicating between previous proposals regarding the theorized relationship between the different readings in nominalizations. At a high level of abstraction, these different theories fall into two broad classes:

1. **Homophony accounts:** The derived nouns in (30) sound the same, but are in fact different lexical items (e.g. Zimmermann 2019) or involve the same Root and homophonous affixes, and/or homophonous but distinct syntactic structures (Alexiadou 2001; Moulton 2013; Borer 2013 a.o.).
2. **Polysemy accounts:** There is only one derived noun *observation*, which can be construed in any of the three senses above by means of a semantic shift in the lexicon (Bierwisch 1990), syntactic coercion (Harley 2009), or allosemy (Wood 2023).

¹⁴A note on terminology: I take the term *ambiguity* to refer to a general property of natural language whereby a given word or structure can have more than one meaning, without implying a commitment as to how the different meanings come about – the latter is the question to which I hope to contribute with this work.

Structural ('non-lexicalist') accounts from the *homophony* family are especially pervasive in the literature, but they are particularly burdened by additional readings – this type of theory typically accommodates one larger and one smaller structure; for example, one with a phrasal verbal projection below the nominalizer, and one with the nominalizer Root-attached. Two structures, in such a theory, should correspond to (exactly or at most) two readings.

Non-structural ('lexicalist') accounts, on the other hand, potentially predict sets of readings greater than two ('> 2'). In fact, depending on the theory of available representations and operations in the lexicon, the number of readings predicted is potentially very large.

In this chapter of the dissertation, I aim to show that in contrast to the above, a *structural polysemy* account, in which different interpretations derive from allosemy of a small set of functional heads in the syntactic structure, predicts a small (but '> 2') set of readings. I also argue that this type of analysis is particularly well-suited to capture the syntactic contexts in which we find the nominalizations under their various readings. Unlike some previous structural analyses, it does not overpredict modification possibilities by postulating noun-internal phrasal vP projections (cf. Wood 2023), while maintaining the predictive power of syntactic approaches to word-formation over lexicalist accounts.

Chapter claim: Complex Content Nominalizations (CCNs) and their characteristic syntax of CP-complementation are best accommodated in a *structural polysemy* account of nominalization, here implemented in terms of allosemy of *v* and *n*.

To make the case for this analysis, I will first review some background on nominalizations in general and their syntactic context in German in particular, before moving on to the lessons from the content reading.

3.1 INTRODUCING THE READINGS

In German as in English, nominalizations systematically have multiple interpretations.

- (32) a. Die Beobacht-ung des Nachthimmels dauerte drei Stunden
 the observe-NMLZ the.GEN night.sky took three hours
 ‘The observation of the night sky took three hours.’ *Event*
- b. Die Beobacht-ung-en der Astronomin sind für immer verloren
 the observe-NMLZ-PL the.GEN astronomer are for ever lost
 ‘The astronomer’s observations are lost forever.’ *RN*
- c. Seine Beobacht-ung, dass Planeten sich bewegen, veränderte die Wissenschaft
 his observe-NMLZ COMP planets REFL move changed the science
 ‘His observation that planets move changed the science.’ *Content*

As in English, the exact set of available interpretations *varies with the verb*: In principle, a nominalization can have an event reading, as well as readings referring to states resulting from events, and to concrete and abstract objects (such as content). It is important to stress at this juncture that the content reading is conceptually distinct both from the event reading and, potentially, from concrete object and result (state) readings. This can be obscured by the fact that one linguistic context typically allows for more than one reading. For example, what I have labeled the *RN* reading in (32b) is a nominalization that can, in its linguistic context, refer to a concrete object (such as a ledger containing the astronomer’s observations) or to the result of an act of observing, or, in principle, to the contents of the observation. I will generally use the label ‘RN’ to refer to a reading that is distinct from both the event and an available content reading, providing specifics only where necessary.¹⁵ The *content* reading, though available in (32b), is made especially salient by the inclusion of a CP complement which specifies the content, as in (32c) (more on the availability of the content reading in other contexts in section 3.4).

Beobachtung in (32) is, morphologically, an *-ung*-nominalization. This is the class of deverbal nominalizations in German that has received by far the most attention in the previous literature (also see chapter 5), and as we will see, many content nominalizations in German are *-ung*-nominalizations. However, the following table shows that it would be misleading to reduce the present investigation of content nominalizations to *-ung*-nominalizations. The presence of a content interpretation does not depend on the presence of the *-ung*-nominalizer.

¹⁵As a tendency, syntactically oriented work appears to group the result state reading with the object readings (cf. Grimshaw 1990; Alexiadou 2001 a.o.), while semantically oriented work sometimes groups it with the event reading (cf. Bierwisch 1990; Ehrich and Rapp 2000).

Verb	Noun	Result	Event	Content	
beobachten	Beobacht-ung	✓	✓	✓	observation
vermuten	Vermut-ung	✓	✓	✓	suspicion
entdecken	Entdeck-ung	✓	✓	✓	discovery
behaupten	Behaupt-ung	✓	✓	✓	claim
gestehen	Geständ-nis	✓	✓	✓	confession
überzeugen	Überzeug-ung	✓	✗	✓	conviction
annehmen	Annahm-e	✓	✗	✓	assumption
meinen	Mein-ung	✓	✗	✓	opinion
erkennen	Erkennt-nis	✓	✗	✓	realization
ergeben	Ergeb-nis	✓	✗	✓	result
denken	Gedank-e	✗	✗	✓	thought
glauben	Glaub-e	✗	✗	✓	belief
hoffen	Hoffn-ung	✗	✗	✓	hope
✗	Gerücht	✓	✗	✓	rumor
etc.					

Table 2: Some German content nominalizations.

What this table shows is that an investigation of content nominalizations will necessitate looking at a cross-section of nominalizers rather than focusing on *-ung* in particular, as has been done in most of the previous literature. As we will see, the *allosemy* approach allows for the dissociation of the exponents of *n* from the interpretation of the nominalization, given the distribution of readings above, I take this to be an advantage.

In the same vein, note also the lower half of the table, which shows that the presence of a content reading does not depend on the presence of an event reading, nor on a RN reading that is separate from the content reading (recall that I am using the ‘RN’ label somewhat loosely, in line with the previous literature, to collect different kinds of interpretations such as concrete objects and result states). For the noun *Hoffnung* (‘hope’), for instance, it is clear that the noun cannot refer to an event of hoping. Whether there is a separate result reading, some kind of mental state, is more difficult to say (see section 3.6 for some discussion of the difference between mental states and the content reading).¹⁶ Thus, we are unlikely to find a good approach to their analysis by pre-committing to an implicational relationship

¹⁶What does seem clear is that there is no concrete object interpretation of *Hoffnung* except metaphorically – as in ‘*There’s no medicine like hope*’ or ‘*He crushed my hopes and dreams, so I had to break up with him.*’

between the readings under consideration. This is not to say that there are no important implicational relationships at play between state and event readings in particular, and in polysemy more generally. It merely shows that the system that is responsible for systematic polysemy needs enough flexibility to allow the readings to separately at least some of the time, depending on particular sets of Roots or [Root v] complexes and alloemes of *n* (as discussed below).

The table prompts an additional observation that I will mostly set aside here, but return to in subsequent chapters. At least two nouns in this table, *Annahme* ('assumption') and *Behauptung* ('claim') are polysemous in an additional sense. *Annahme* can mean 'acceptance' in addition to 'assumption', *Behauptung* can refer to a situation in which control is successfully retained, in addition to a 'claim'. The respective verbs and the corresponding nouns have a different argument structure when associated with these meanings, and crucially lack a content reading. The nuance of these meaning differences must be considered when evaluating the interpretative possibilities, as was done to create the table above. Consider the following example:

- (33) a. *Seine An-nahm-e der Lüge dauerte drei Minuten
 his AN-take-NMLZ the.GEN lie took three minutes
 'His assumption of the lie took three minutes'
- b. Seine An-nahm-e der Medaille dauerte drei Minuten
 his AN-take-NMLZ the.GEN medal took three minutes
 'His acceptance of the medal took three minutes'

With the 'acceptance' meaning, the noun *An-nahme* does have an event reading (as diagnosed by the event property of having temporal duration) that it does not seem to have with the 'assumption' meaning. In the context of a broader discussion of prefixation, I will argue in chapter 4 that this 'other' kind of polysemy, which is more intrusive to the lexical meaning of the Root, can be made to fall out from different interpretations of the prefix-Root complex, which is also subject to alloemy. It should also be noted that in spite of the claim above about the dissociation of particular exponents from particular interpretations, there are generalizations about the types of readings that can arise with *some* nominalizers in the language, for example, nominalized infinitives typically have an event reading. I postpone a more

detailed discussion of nominalized infinitive and *-ung*-nominalizations in particular to chapter 5.

3.2 THE SYNTAX AND INTERPRETATION OF DEVERBAL NOMINALIZATIONS

Equipped with these initial observations on the content reading, we can now take a step back to consider the kinds of observations that syntactic accounts of nominalizations aim to capture more broadly, as well as some of the relevant properties of German syntax in particular.

Grimshaw (1990) argues for English that the *event* reading is intimately tied to the presence of an internal argument. The main claim in chapter 3 of “Argument Structure” is that Complex Event Nominals (CENs) obligatorily take arguments, distinguishing them from simple event nominals, result nominals, passive nominals, and nouns that take clausal complements, all of which, according to Grimshaw, do not take arguments. In this way, she strictly ties the event interpretation of CENs to their argument structure. This intuition has found its way into the syntactic literature, where the event interpretation is tied to more verbal structure in CENs, which then also licenses arguments (cf. Alexiadou and Grimshaw 2008 for the argument that the lexical and syntactic analyses converge in empirical prediction). In Grimshaw’s classification, some nouns are unambiguously event-denoting or not, but she mostly discusses the ambiguous cases, in which both an eventive and a second interpretation are in principle available. The crucial components of the analysis then rest on disambiguation; in particular, the internal argument becomes obligatory in the presence of material that disambiguates towards the CEN reading. In the examples in (34), taken from Grimshaw, the disambiguating material is bolded. It can consist in modifiers like *frequent* or *constant*, purpose clauses, or aspectual modifiers like *in only two days*.

- (34) a. The **frequent** expression *(of one’s feelings) is desirable.
 b. the translation *(of the book) **in order to make it available to a wider readership**
 c. the total destruction *(of the city) **in only two days**

This first set of facts translates more or less directly to German.

- (35) a. Der **häufige** Ausdruck *(der eigenen Gefühle) ist notwendig
 the frequent express.NMLZ the.PL.GEN own feelings is necessary
 ‘The frequent expression of one’s feelings is necessary’
- b. die Übersetz-ung *(des Buches) **um es einer breiteren Leserschaft zugänglich zu machen**
 the translate-NMLZ the.GEN book to it a wider readership available to
 make
 ‘the translation of the book in order to make it available to a wider readership’
- c. die völlige Zerstör-ung *(der Stadt) **in nur zwei Tagen**
 the total destroy-NMLZ the.GEN city in only two days
 ‘the total destruction of the city in only two days’

The flip side of disambiguation towards the CEN reading is disambiguation towards an RN reading. Two options for this second type of disambiguation from Grimshaw’s work are illustrated in (36).

- (36) a. the assignments (*of the problem) took a long time
 b. the examination (*of the patient) **was on the table**

In (36a), the nominalization is pluralized. CENs, Grimshaw argues, can never be plural, and so the plural marker disambiguates away from the CEN reading, which in turns makes the internal argument impossible. The idea that CENs tend to behave as mass nouns in this way is sometimes taken to be crucial to their analysis (cf. Harley 2009), but this behavior does not seem to be exceptionless in English or German.

- (37) a. There were three arrivals of a train (Alexiadou et al. 2010)
- b. ?Die Reinig-ung-en des Hallenbades finden regelmäßig statt
 the clean-NMLZ-PL the.GEN pool happen regularly PRT
 ‘The cleanings of the pool happen regularly’ (adapted from Ehrich 1991, judgment mine)
- c. Die Reinig-ung-en der Hallenbäder werden von unterschiedlichen Firmen durchgeführt
 the clean-NMLZ-PL the.PL.GEN pools are by different companies
 carried.out
 ‘The cleanings of the pools are carried out by different companies’ (Florian Schwarz, p.c.)

Ehrich (1991) and Wood (2023) argue that the plural examples should be taken at face value, and that the

availability of a ‘plural’ event reading is in some way dependent on aspectual properties of the event, in particular, events have to be repeatable for the plural to make sense. Of course, how this interacts with the mass/count distinction is not trivial, and, at least to my ear, even the supposedly good plural event nominalizations have a somewhat marginal status. In (37b), for example, where the context does favor the event interpretation, several speakers I have consulted spontaneously corrected to the singular. (37c) is better, but has a collective interpretation due to the plural internal argument. Other examples of plural event nominalizations reported in the literature are at least equally marginal, or have other confounds, such as the interpretation of the postnominal genitive in (38):

- (38) Die Umdispos-ition-en des Dirigenten zogen sich über Tage hin
 the rearrange-NMLZ-PL the.GEN conductor went REFL for days on
 ‘The conductor’s rearrangements went on for days’ (Bierwisch 1990)

In this example, cited by Bierwisch to question the validity of Grimshaw’s generalizations for German, the postnominal genitive is not interpreted as the Theme, but as the agent of the event. Crucially, this means that there is no conflict between Grimshaw’s argument generalization and the plural marking in this case. Because the fact that the postnominal genitive is in general flexible with regards to the thematic role that is realized in this position is a serious complication in the investigation of this structure in German, I discuss this issue in a little more detail in the next subsection, before turning to the specific syntactic context of the content reading, i.e. the selection of a CP complement.

3.2.1 THE POSTNOMINAL GENITIVE

Compared to the English *of*-phrase, the main structural argument position in the German DP – the postnominal genitive – is considerably less restricted in its ability to realize arguments. Many (though, importantly, not all) postnominal genitives are ambiguous between a Theme and an Agent reading. In traditional grammar, these readings are referred to as the *genitivus objectivus* and *genitivus subjectivus*, respectively. Importantly for our purposes, the availability of these readings is connected to the properties of the nominalizations (cf. Schäublin 1972). The following example is from Ehrich and Rapp (2000),

who extensively discuss the restrictions on the availability of the agent reading.

- (39) a. die Befrag-ung des Kanzlers
 the question-NMLZ the.GEN chancellor
 ‘the questioning of the chancellor’
 OR ‘the questioning by the chancellor’
- b. die Absetz-ung des Kanzlers
 the remove-NMLZ the.GEN chancellor
 ‘the removal of the chancellor’
 NOT ‘the removal by the chancellor’

In (39a), with the nominalization *Befragung* (‘questioning’), the postnominal genitive can be interpreted as either the Theme or the Agent of the questioning event. In (39b), on the other hand, the Agent reading is not available – the chancellor can only be interpreted as the one who is removed. To explain this asymmetry, a natural first hypothesis would be that the Theme reading is obligatory in (39b) because the realization of the Theme argument is obligatory. But obligatoriness cannot be the whole story: in the verbal domain, both *befragen* (‘question’) and *absetzen* (‘remove’) have obligatory internal arguments.

- (40) a. Der Ausschuss befragte *(den Kanzler)
 the commission questioned *(the.ACC chancellor)
 ‘The commission questioned the chancellor.’
- b. Das Militär setzte *(den Kanzler) ab
 the military removed *(the.ACC chancellor) AB
 ‘The military removed the chancellor.’

It would be a mistake to conclude from this that the effect in (39) is unrelated to the properties of the verbs that the nouns are derived from. As Ehrich and Rapp (2000) discuss, the interpretation of the genitive is constrained by aspectual and event-structural properties of the underlying verb, in particular, Ehrich & Rapp argue that telic change-of-state verbs force the Theme interpretation of the genitive in the event nominalization as well as its realization. This of course is reminiscent of the most canonically obligatory internal arguments under the event reading in English as well – examples of the ‘destruction

*(of the city)' type. What we can take away from this is that although the postnominal genitive in German can in principle be interpreted to refer to different arguments, there are verb-dependent restrictions in the event reading, such that internal arguments of at least some verbs do have to be inherited by the event nominalizations.

It seems that these restrictions on the interpretation of the complement at least partially extend to *von*-PP arguments, although I have found little discussion of this in the theoretical literature. The following was published in a collection of amusing grammatical mistakes in Spiegel magazine:¹⁷

- (41) Liebe Kunden, aufgrund der bevorstehenden Geburt von meiner Frau bin ich an den
 dear costumers, because of.the imminent birth of/by my wife am I on the
 folgenden zwei Samstagen [...] nicht für Sie da.
 following two Saturdays [...] not for you there.

'Dear costumers, due to the imminent birth of my wife I cannot be here for you on the following two Saturdays.'

For present purposes, I will mostly set aside *von*-PP complements, as well as the prenominal genitive, to focus on the respective properties of post-nominal genitives with Theme interpretations and CP complements with content interpretations. Note that in German as in English, the prenominal position appears to be more restrictive with respect to the affectedness or involvedness of the argument that can appear there (Alexiadou et al. 2013; Wood 2023 for Icelandic), yet less restrictive than the postnominal position in a different sense: While the argument in prenominal position needs to be capable of being a possessor or event participant, it does not have to be the agent of the event.

The broader point of introducing this data is to demonstrate that the relationship between the available interpretation of nominalizations and their arguments is intricate and depends on the syntactic structure as well as properties of the [Root v] complex and the arguments themselves. Before we see this in more detail with respect to the content reading in particular, the last piece of background that we need concerns the syntactic and semantic status of complement CPs.

¹⁷<https://www.spiegel.de/kultur/hohlspiegel-a-75d18f86-6f1e-42f4-947a-0e0dd2b78d8c>

3.3 SELECTING CP

The main focus in this chapter is on the *content* interpretation with CP complements (the initial example of this from (32c) is repeated in (42)), which means that we need to think carefully about the complex theoretical status of CP complementation.

- (42) Seine Beobacht-ung, dass Planeten sich bewegen, veränderte die Wissenschaft.
 his observe-NMLZ COMP planets REFL move changed the science
 'His observation that planets move changed the science.' *Content*

It is characteristic for content nouns to appear with a clausal complement that specifies the propositional content that the nominalization is identified with. In this section, I will review some of the literature on the selection of CP, and in particular on nouns that combine with complement CPs. This will allow us to further substantiate the claim in this chapter that content nominalizations are relevant to the discussion of the argument-introducing and 'verbal' properties of nominalizations more broadly.

3.3.1 CPs BETWEEN ARGUMENTHOOD AND SELECTION

There is a long-standing question in the literature about whether CPs are syntactically selected in the same way that DPs (or NPs) are. It is obviously true that there are restrictions *of some kind* on the distribution of CPs both in the verbal and nominal domain:

- (43) a. Ahab observed that the whale had returned
 b. *Ishmael kicked that the whale had returned
 c. the fact that the whale had returned
 d. *the ship that the whale had returned

In English, (43d) is grammatical under the irrelevant relative clause reading, but this is not the case in languages that reliably distinguish complementizers and relative pronouns, I will return to the the difference between complement CPs and relative clauses below. However, there is an important strand of research

on selection going back to Grimshaw (1979) which uses CPs to illustrate the importance of *semantic* selection (s-selection). As we will see in more detail in this subsection, Grimshaw originally argued that s-selection was at work *in addition* to c-selection, but as early as Pesetsky (1982, 1991) and continuing on to Newman (2021), Grimshaw's arguments have been taken to show that c-selection in fact plays no role in the distribution of CPs at all. It is important to note here that the question of whether CPs are c-selected or s-selected (or both, or neither) is separate from the question of whether they have argument or adjunct status in the verbal and nominal domain, to which we return below. That is to say, complement CPs could be arguments without being c-selected (indeed this is the position taken by Pesetsky and in Newman 2021), and even the minimal data in (43) serves to show that *something* has to constrain the distribution of at least some CPs. I will now review some of the debate around the c-selection of CP, and show that the move towards an account based purely on s-selection raises some questions that have not yet been addressed in this literature.

To recapitulate the argument that the distribution of CPs is crucially or even entirely due to semantic considerations and s-selection, we return first to Grimshaw's original argument for the importance of s-selection. Grimshaw contrasts *wh*-initial clauses that are interpreted as interrogatives (Q) with *wh*-initial exclamatives (E). She makes the claim that in order for predicates to combine with complements, they have to both subcategorize on the syntactic level (c-selection) and be selected in the semantic representation (s-selection). The crucial contrast is illustrated in (44), from Grimshaw (1979: p. 281):

- | | | |
|------|---------------------------------------|-----|
| (44) | a. John knows whether he is a fool | (Q) |
| | b. John knows what a fool he is | (E) |
| | c. Fred will ask whether he is a fool | (Q) |
| | d. *John will ask what a fool he is | (E) |
| | e. *It's amazing whether he is a fool | (Q) |
| | f. It's amazing what a fool he is | (E) |

This paradigm shows that some predicates can embed both interrogatives and exclamatives, while some

can only embed one or the other. It also already suffices to make the point that a coarse theory of c-selection will not be sufficient to capture CP distribution, assuming that both *whether* and *what a* head wh-initial CPs in these contexts.

Under Grimshaw's account, the reason for the ungrammaticality of (44d,e) is purely semantic – for instance, predicates like *ask* select an interrogative complement, but “what a fool he is” is an exclamative. Importantly, the semantic distinction between Q and E is apparent even in cases where there is no overt difference between the two strings, as illustrated by the fact that (45a) has only the exclamative (E) interpretation, while (45b) has only the interrogative (Q) interpretation (Grimshaw 1979: p. 282):

- (45) a. It's amazing how tall John is (E)
 b. Fred will ask how tall John is (Q)

Of course, in these cases, the semantic distinction does not lead to ungrammaticality for either type of embedding predicate, but the predicate does force a disambiguation between the two. Grimshaw argues that there is no purely syntactic reason for features like *[wh]* for interrogatives or *[ex]* to differentiate complementizers in order to get the selection done syntactically.

- (46) ‘In essence, treating complement selection syntactically is possible only if the relevant aspects of semantic interpretation are built into syntactic structure.’ (Grimshaw 1979: p. 317)

The same semantic difference, and the same s-selectional effects, are argued to obtain in concealed questions. According to Grimshaw, c-selection operates basically as subcategorization in the sense of Chomsky (1965), with all of the above predicates subcategorizing for \bar{S} . One may wonder at this juncture whether c-selection is really still necessary in addition to s-selection (I discuss Pesetsky's version of this argument below), but Grimshaw argues that c-selection does work in this system, such as distinguishing between obligatory and optional \bar{S} subcategorization (47a,b), as well as ruling out concealed questions for predicates that do not c-select NP (47c):

- (47) a. I already found out (that ...) optional \bar{S}

- | | |
|--------------------------------------|----------------------|
| b. I already figured out *(that ...) | obligatory \bar{S} |
| c. *I wonder the answer he gave | concealed Q |

These facts will be important to keep in mind as we move on to proposals that suggest doing away completely with c-selection for CPs.

Pesetsky (1991) claims that Grimshaw's considerations should lead us to a theory that replaces c-selection completely. This argument proceeds in a few steps. First, Pesetsky expands on a gap noticed by Grimshaw in a footnote, and investigated further in Grimshaw (1981):

(48) *Grimshaw's s-selection generalization*

There are no predicates in English that s-select Q or E and allow only concealed questions syntactically (that is, only c-select NP, not CP).

To illustrate the concealed question gap, consider a hypothetical predicate 'morx':

- (49) The concealed question gap, hypothetical verb morx
- | |
|---|
| a. *I morxed [_{CP} what time it is] |
| b. I morxed [_{NP} the time] |

Predicates with this pattern of selection do not exist in English.

To derive this generalization, Grimshaw (1981) invokes the *Context Principle*, which states that if a predicate s-selects a semantic category C, the learner infers that the predicate c-selects the Canonical Structural Realization CSR(C) of that semantic category (which in the case of Q is CP). For Grimshaw, the Context Principle is crucially a principle of language acquisition; that is, it helps the learner to *discover* c-selectional relationships rather than replacing them in the grammar.

However, Pesetsky (1991) argues that a principle like this makes c-selection for CP unnecessary entirely, without by itself replacing c-selection for NP. This argument is based on an apparent redundancy

in the system: there is a sense in which the effects of the Context Principle in explaining the distribution of CP reduces to the idea that CPs can occur wherever they are s-selected. Pesetsky argues that this points towards an account for the more limited availability of NP in concealed questions through a mechanism which affects only NP, but not CP, to begin with: a case-theoretic explanation. Pesetsky's implementation is that all predicates that s-select P, Q, or E in fact allow CP *and* NP arguments, but differ in whether they assign case to NP.

- (50) a. John wondered [_{CP} what the time was]
 b. *John wondered [_{NP} the time]
 c. John asked [_{NP} the time]
 d. It was asked [_{CP} what the time was]
 e. *It was asked [_{NP} the time] (Pesetsky 1991: p. 7)

Contrasting the predicates *wonder* and *ask*, the idea is that *wonder* does not assign case to its complement, but *ask* does. The above paradigm shows that CP, which does not require case, is licensed either way, including when *ask* is passivized (50d) and therefore no longer able to assign object case. This is what rules out (50e).

In terms of the distribution of NP complements in concealed questions, this account seems to work quite well. The question that is relevant here is whether the account succeeds in completely removing the need for c-selection in the grammar. What is clear is that this can only be the case if we accept a significant additional burden elsewhere, both in terms of acquisition, and in terms of s-selection.

Recall first that Grimshaw conceived of the Context Principle as a principle of the *acquisition* of sub-categorization frames. By moving the implementation of the effects of the principle into the grammar itself, Pesetky's account changes the burden on the learner in an interesting way: On the one hand, the learner must now in a first step infer that *all* predicates which s-select for P, Q, or E, in principle allow both CP and NP as realizations, which is simpler, but ultimately incorrect. The learner must then superimpose the knowledge of which predicates are able to assign case to NPs, allowing them to rule out the illicit V+NP combinations. In other words, while the learner is using the available evidence to *add*

permissible predicate+XP combinations for Grimshaw, they have to be able to *reduce* the space of permissible combinations for Pesetsky.

Secondly, and more importantly for our purposes, the removal of a principle of c-selection for CPs from the grammar is a non-starter unless we can indeed rely on s-selection to correctly distribute CPs. There is a potential problem with this within Pesetsky's own theory: Pesetsky calls the assumption that both CP and NP *a priori* qualify as canonical realizations of semantic types P, Q, and E 'at least as reasonable as Grimshaw's' (Pesetsky 1991: p.6), but it is undoubtedly and crucially a different assumption in kind: Grimshaw's idea is that the canonical realization of a semantic type is *specified*, Pesetsky's is that it is *un(der)specified*.

The first important question that emerges from this line of work is whether we should accept that the semantic properties of CP-selecting verbs and nouns are sufficient to derive where CP complements can occur. If we assume that this is correct, we have to ask a follow-up question: Is s-selection implementable in present-day theories of the syntax-semantics interface, and if so, how? Before we return to this question, the next subsection will move the discussion back into the nominal domain.

3.3.2 NOUNS AND (CLAUSAL) ARGUMENTS

Largely separately from the selection debate recapitulated in the previous subsection (which took place primarily in the verbal domain), a long line of research argues that nouns either cannot take complements at all, or that at least CPs are never complements to nouns (cf. Stowell 1981; Kayne 2010; Krapova and Cinque 2016 a.o.).

Let's begin with the observation that there is an interesting disconnect between the assumptions that are typically made about complement clauses in the verbal and nominal domain, respectively (also see Djärv 2019 for discussion). In the verbal domain, complement clauses are usually taken to be relatively argument-like – they do not get case, but are in complement position and have the ability to essentially saturate an argument position (although cf. Kratzer 2006). In the nominal domain, complement clauses are usually taken to be adjuncts (going back to Stowell 1981) and combine by some version of Predicate Modification (e.g. Zimmermann 2019) or Restrict (Moulton 2013). CP complements, under this view,

are implicitly or explicitly treated as relative clauses (Arsenijević 2009; Krapova and Cinque 2016, see references and discussion in de Cuba 2017). This line of argumentation typically capitalizes on the fact that some CPs can stand in a predication relation to the noun.

- (51) a. the observation [_{CP} that the ship was dangerously close to the shore]
 b. the observation **is** [_{CP} that the ship was dangerously close to the shore]

This seems to point to a modifier-like relationship between the CP and the noun in (51a), which would potentially be a natural fit with the idea that the CP does not have to be c-selected, but can appear wherever it is licensed semantically. Note, however, that Grimshaw's and Pesetsky's original proposal for s-selection assumed rich semantic representations, projected from the lexicon, that are quite different from the types of objects that semantics typically deals in today. The modifier-treatment semantically merely translates to the claim that CPs are of type $\langle e, t \rangle$ and combine by Predicate Modification (cf. Elliott 2020; Moulton 2009, and see section 3.5). Model-theoretic semantics by itself only rules out CPs where they lead to a type clash, which, under this treatment, they will not in most of the relevant cases.

There are other problems with assimilating CP complements to relative clauses syntactically: while English uses *that* in both types of clauses, many languages have separate complementizers in that-clauses (cf. de Cuba 2017). Even in English, that-clauses do not behave the same as relative clauses with respect to that-deletion and one-anaphora, even with the same nouns, cf. Kayne (2010: p. 178):

- (52) a. the fact *(that) they're here is irrelevant
 b. the fact (that) they mentioned is irrelevant
- (53) a. *the fact that they're right and the one that you're wrong
 b. the fact that they mentioned and the one that you mentioned

To summarize, the modifier-like treatment of CP-complements has the advantage of deriving the identification of noun and propositional content of the complement clause – in this sense, the semantic analysis seems to be on the right track. However, the relative clause analysis does nothing to derive the

distribution of complement clauses. The distribution of CP complements is not the distribution of relative clauses – where the latter combine with just about any noun, clausal complements are restricted.

The review in this section leave us with a tension: On the one hand, we have seen that the syntactic status of selection for CPs has been questioned, and that semantics does seem to play an important role in their distribution. On the other hand, their semantic type *underdetermines* where content CPs can occur: at best, it predicts their distribution should be identical to relative clauses, which is incorrect for the nominal domain (and a non-starter for the verbal domain). In what follows, I explore the idea that the way out of this tension is to embrace allosemy as a way of encoding that interpretative properties beyond type are at issue in the introduction of CP complements. Crucially, this interpretative property must be available for some Roots in the syntactic context of *v*, to apply in the verbal domain, and in the syntactic context of *n*, to apply in the nominal domain. In fact, as the next section will demonstrate, the behavior of a given Root in the syntax of nominalization closely tracks its behavior in the verbal domain.

3.4 LESSONS FROM THE CONTENT READING

The previous section has demonstrated some of the issues that are at stake in relating nouns and their clausal complements. In this section, we will return to the particular case of nominalizations and their clausal complements. As we will see momentarily, nominalizations pattern closely with the verbs that they are derived from in their ability to take CP complements. This will lead us to the question what role nominalization plays in the introduction of CP complements: is this property ‘inherited’ from the verb, or is it a property of the Root that is inherited by the verb and the nominalization separately? In line with the literature on the syntax of event nominalizations, I contend that it is mostly the former, this is based primarily on the fact that verbs and nominalizations pattern together more consistently than we would expect if the content reading was purely a Root property. However, there *are* nouns that can receive a content reading without being derived from a verb, such that it must at least be possible for the content reading to arise in a non-verbal context.

First, let us take a closer look at some of the ways in which verbs and nominalizations pattern to-

gether syntactically.

As we have seen, some argument-taking properties of the verb are mirrored in nominalizations, this is also true of the ability to take a clausal complement.

- (54) a. Der Kapitän beobachtete, dass Delfine sehr schnell sind.
 the captain observed COMP dolphins very fast are
 ‘The captain observed that dolphins are very fast.’
- b. die Beobacht-ung, dass Delfine sehr schnell sind
 the observe-NMLZ COMP dolphins very fast are
 ‘the observation that dolphins are very fast’

The noun *Beobachtung* (‘observation’) takes a clausal complement, just like the verb *beobachten* does, whereas the noun *Inspektion* (‘inspection’) does not, just as the verb *inspizieren* lacks this ability for no obvious non-arbitrary reason.

- (55) a. *Die Biologin inspizierte, dass Octopusse sehr klug sind.
 the biologist inspected COMP octopuses very clever are
 ‘The biologist inspected that octopuses are very clever.’
- b. *die Inspekt-ion, dass Octopusse sehr klug sind
 the inspect-NMLZ COMP octopuses very clever are
 ‘The inspection that octopuses are very clever.’

This is what is meant by the claim that verbs and nominalizations come in *pairs* concerning their ability to take clausal complements and receive the content reading in that context. Most such verb-noun pairs do not obligatorily take a clausal complement, they can usually take a PP or DP complement instead. These options are equally parallel in the nominalizations to the verbal domain. For example, *hoffen* and *Hoffnung* (‘hope’) allow CP and PP complements, but not DPs.

- (56) a. Sie hofft, dass es regnen wird.
 she hopes COMP it rain will
 ‘She hopes that it will rain.’
- b. ihre Hoffn-ung, dass es regnen wird
 her hope-NMLZ that it rain will

CP complement

- 'her hope that it would rain'
- c. Sie hofft auf Regen.
she hopes on rain
'She is hoping for rain.' *PP complement*
- d. ihre Hoffn-ung auf Regen
her hope-NMLZ on rain
'her hope for rain'
- e. *Sie hoffte (den) Regen.
she hoped (the.ACC) rain
'she hoped rain' *no DP complement*
- f. *ihre Hoffn-ung des Regens
her hope-NMLZ the.GEN rain
'her hope of rain'

Furthermore, some verbs and their nominalizations are picky with respect to the internal arguments that they allow in ways that seem to relate to their conceptual meaning. For example, it is possible to claim 'the opposite', but not 'the lie'.

- (57) a. *Sie behauptete die Lüge.
she claimed the lie
- b. *Ihre Behaupt-ung der Lüge
her claim-NMLZ the.GEN lie
- c. Sie behauptete das Gegenteil.
she claimed the opposite
- d. Ihre Behaupt-ung des Gegenteils
her claim-NMLZ the.GEN opposite
'Her claim of the opposite'

Recognizing such restrictions is important for two reasons. The first reason is that it makes clear that it would be misguided to conclude from one ungrammatical example of a plausible internal argument with a nominalization that that nominalization is incapable of appearing with *any* internal argument. The second reason is that these examples stress that nuanced interpretative information can play a role in the availability of a particular argument and, naturally, its interpretation. In the grammatical examples

above, the argument, in the verbal as well as nominal domain, is interpreted as the content of the claim, just as a CP complement would be. This is important because it shows that the specification of such a content interacts with the *event* interpretation differently from Theme arguments. Recall that following Grimshaw (1990), the availability of the event reading is generally thought to be tied to the presence of an internal argument. The specification of the *content*, on the other hand, allows but does not force the *event* reading. However, the content specification does act as an internal argument in the sense that it becomes obligatory when the event interpretation is independently picked out:

- (58) Ihre ständige Behaupt-ung *(des Gegenteil) nervt ihn extrem.
 her constant claim-NMLZ *(the.GEN opposite) annoys him extremely
 'Her constant claim of the opposite is extremely annoying to him.'

To reiterate this important but somewhat complicated point, nominalizations with a postnominal DP that specifies their content show a mixed behavior with respect to the availability of the *event* interpretation. On the one hand, they can serve as the obligatory argument in the event interpretation, as in (58). On the other hand, their presence does not force the *event* interpretation – in fact, the most salient interpretation is usually (perhaps trivially) the *content* interpretation.

This observation prompts us to briefly turn to putative counterexamples to the generalization that non-event nominalizations cannot take arguments. These have been puzzling to researchers in the previous literature because some of them are quite clearly grammatical, yet nonetheless so many examples can be constructed in which the RN interpretation and an internal argument are incompatible. But consider the nature of the following counterexamples in English and German:

- (59) a. the discussion of the data (was published in a journal) (Alexiadou 2001)
 b. the translation of the essay (was on the table) (Melloni 2010)
 c. Lisa's concoction of Cherry 7-Up and grain alcohol (Lieber 2016)
 d. Die Bearbeit-ung der Sonate ist verschwunden
 the arrange-NMLZ the.GEN sonata is vanished
 'The arrangement of the sonata has vanished.' (Ehrich & Rapp 2000)

What these examples have in common with our content noun examples is that the postnominal genitive or English *of*-phrase are identified to some extent with the content of the head noun. It is reasonable to expect, then, that the explanation of the relationship between content nominalization and its content-denoting complement will extend to these cases as well.

I have shown above that many nouns that can take a clausal complement can in principle appear with a DP, PP, or CP complement. We have also seen that the DP and the CP can act as the internal argument for the purposes of the event interpretation, but do not force it in the way that Theme arguments do. This mixed behavior brings us to a consideration of co-occurrence restrictions between DPs, CPs, and PPs in and around nominalizations. In general, the more ‘argument-like’ and obligatory a complement is, the less we expect it to be able to co-occur with another argument that competes for the same position (recall that there is only one argument position in the DP following the noun). In this light, it is remarkable that DP and CP indeed cannot co-occur, while there is no such restriction on co-occurrence with a PP.

- (60) a. die Entdeck-ung, dass der Politiker korrupt ist
 the discover-NMLZ COMP the politician corrupt ist
 ‘the discovery that the politician is corrupt’
- b. die Entdeck-ung der Unterlagen
 the discover-NMLZ the.PL.GEN documents
 ‘the discovery of the documents’
- c. *die Entdeck-ung der Unterlagen, dass der Politiker korrupt ist
 the discover-NMLZ the.PL.GEN documents COMP the politician corrupt is
- d. *die Entdeck-ung des Politikers, dass er korrupt ist
 the discover-NMLZ the.GEN politician COMP he corrupt ist
not: the discovery of the politician₁ that he₁ is corrupt
- e. die Entdeck-ung über den Politiker, dass er korrupt ist
 the discover-NMLZ about the politician COMP he corrupt ist
 ‘the discovery about the politician that he is corrupt’

In (60c) and (60d), we see that a DP and CP complement cannot co-occur, in spite of the fact that the meaning to be expressed is perfectly plausibly, a fact that is underlined by the possibility of (60e). This

is another way in which CP complements in nominalizations do behave like arguments – they compete with DP arguments. The same holds, unsurprisingly, in the verbal domain.

A final syntactic property of clausal complements in nominalizations that I would like to touch on in this section is Mood. In the verbal domain, the mood alternation in the following sentences seems to track tense:

- (61) a. Lukas **behauptet**, dass er schon auf 50 Metallica-Konzerten gewesen ist/?sei
 Lukas claims COMP he already at 50 Metallica-concerts been is.(IND/SBJV)
 ‘Lukas claims that he has been to 50 Metallica concerts already’
- b. Lukas **behauptet-e**, dass er schon auf 50 Metallica-Konzerten gewesen ?ist/sei
 Lukas claim-PST COMP he already at 50 Metallica-concerts been is.(IND/SBJV)
 ‘Lukas claims that he has been to 50 Metallica concerts already’

The indicative is preferred in the present, the subjunctive in the past tense. Once we turn to clausal embedding with the corresponding nominalization, we find that a mood distinction can be observed there as well. This is initially unexpected, given that there is no tense in the nominal domain.

- (62) a. Lukas’ **Behaupt-ung**, dass er schon auf 50 Metallica-Konzerten gewesen ist/?sei,
 Lukas claim-NMLZ COMP he already at 50 Metallica-concerts been is.(IND/SBJV)
 ist falsch.
 is false
 ‘Lukas’ claim that he has been to 50 Metallica concerts already is false.’
- b. Lukas’ **Behaupt-ung**, dass er schon auf 50 Metallica-Konzerten gewesen ?ist/sei,
 Lukas claim-NMLZ COMP he already at 50 Metallica-concerts been is.(IND/SBJV)
 wiederholt er jeden Tag lautstark.
 repeats he every day loudly
 ‘Every day Lukas loudly repeats his claim that he has been to 50 Metallica concerts already.’

What if not tense is reflected in this mood contrast? I contend that the linguistic contexts in (62) favor different readings of the nominalization. The matrix predicate ‘is false’ in (62a) picks out the *content* reading, while (62b) refers to a repeated event. In German, where one of the main uses of the subjunctive is in reportative contexts (cf. Fabricius-Hansen and Sæbø 2004), it is perhaps not surprising that the

subjunctive is licensed when the noun refers to the actually instantiated act of claiming, since this is the context in which a speech act takes place. Because this is somewhat of a peculiarity of German compared to subjunctives in other languages, this is a language-specific place where we can see the grammatical relevance of the content reading in the nominal domain in particular.

To summarize the empirical picture, nominalizations under the content reading mirror various syntactic properties of their verbal counterparts, notably as the ability to take clausal complements, including restrictions on their distribution as they exist in the verbal domain. In the next section, I will provide an analysis of these facts that expands on aspects of the allosemy analysis of nominalizations in Wood (2023), which I already briefly summarized in chapter 2. As we will see, some of the challenges raised by the content reading are addressed very naturally in this type of approach, others are brought into focus in interesting ways.

3.5 ALLOSEMY IN THE SELECTION OF CONTENT

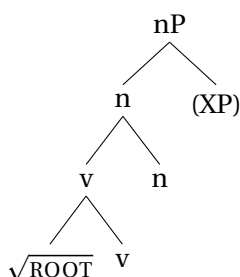
The pieces are now in place to allow us to return to the question of how the different interpretations of a nominalization come about.

I have shown that the conclusion that the realization and interpretation of the internal argument and the interpretation of the noun are related is supported in German, albeit somewhat less straightforwardly than in English due to the greater flexibility in interpretation associated with the postnominal genitive. I conclude that German is mischaracterized as a language where the realization of the nominal argument is divorced from the interpretation of the noun (see e.g. Bierwisch 1990; Pross 2019 for such a claim). Instead, German, like English, presents ample evidence that event nominalizations, and, indeed, content nominalizations, do possess properties that we can make sense of when we see them as crucially mediated by the embedded verbal head ν and the shared Root. In this section, I outline a polysemy account of the ambiguity in German nominalizations. The account is an extension of the allosemy account of Icelandic (and English) nominalizations in Wood (2023), applied to the German data and to the content

reading more broadly, and we will see that it raises similar questions concerning the distinction between Root nominals and deverbal nominalizations. On the issue of bringing the content reading into the fold, the present account is heavily influenced by insights from Bierwisch (1990), Moulton (2013), and Zimmermann (2019), although the latter two authors propose versions of what I have called the homophony account family.

The allosemy account starts from the assumption that the internal syntactic structure of the nominalization itself is the same across the different interpretations.¹⁸ This is in stark contrast to the pervasive homophony approach. The crucial property of the structure in (63) is as follows: across all interpretations of the noun, the syntactic structure includes a ν and a n head which combine with the Root in that order.

(63)

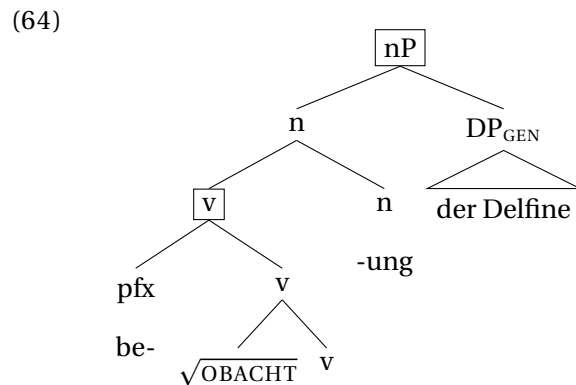


The head n nominalizes the structure and contributes the noun syntax to the nP. The nominalized structure behaves outwardly like a noun for purposes of further syntactic operations, modification, and distribution. DP arguments in the nominal domain receive genitive case. Meanwhile, the head ν serves as the initial categorizer of the Root. In this capacity, it is able to introduce and make accessible verbal properties of the Root, such as event and argument structure. It can also introduce restrictions on the XP complement in (63). Of course, the nominalizations are only syntactically identical. Morphologically, as we have seen, n can have different exponents, and semantically, different denotations for ν and n can lead to the different readings of the noun. On this view, ν and n are subject to *allomorphy* and *allosemy*. The crucial advantage of this analysis is that it derives the dissociation of exponence and interpretation

¹⁸As briefly alluded to above, this assumption is more easily motivated in some cases than others, I will return to this point at the end of this section.

described in section 3.1.

I will begin by applying the analysis from Wood (2023) to the CEN and RN readings in German, before extending it to the content reading. Recall from chapter 2 that Wood (2023) argues that the main difference between the CEN interpretation and the RN interpretation of a nominalization is captured in an allosemy-based approach under the assumption that nouns under the *event* interpretation have essentially verbal semantics, contributed by v . As an example, consider the derivation of the *event* interpretation of the phrase *Beobachtung der Delfine* ('observation of the dolphins'), directly applying Wood's (2023) analysis to the German data.



The crucial nodes in terms of the semantic interpretation are boxed in this representation, their denotation is given in (65).

- (65) a. $\llbracket nP \rrbracket = \lambda e . \text{observe}(e) \ \& \ \text{theme}(\text{dolphins})(e)$
 b. $\llbracket v \rrbracket = \lambda x \lambda e . \text{observe}(e) \ \& \ \text{theme}(x)(e)$

Note that under this analysis, the two core properties of CENs are linked to the embedded verbal structure in the nominalization. At the v level, both the event variable and the Theme relation are already present, just as they would be in the verbal domain.¹⁹ Note further that although the Theme role is introduced by v , the Theme argument is not introduced until after n has been merged. This derives that

¹⁹The syntactic status of the prefix in examples of this type will be discussed briefly below and in much more detail in the next chapter.

the DP has properties of being an argument in the nominal domain, such as genitive case, incompatibility with other arguments, and so on. It is also crucially implicated in the idea that the structure of *n* is complex but ‘small’, in that it does not embed phrasal projections.

Finally, the reader may wonder to what extent the denotation of the boxed *v* node is supposed to be associated with the Root, *v*, the prefix, or some combination thereof. We will return to the status of the Root in this question below, and look at the issue of verb-internal meaning composition in much greater detail in the next chapter. I will argue there that the meaning of these verbs does indeed decompose, but not necessarily in a way that would warrant associating particular parts of the meaning with particular parts of their internal structure. For this reason, I refrain from attributing specific components of the denotation to heads and constituents within *v*.

As is immediately clear from the denotations above, *n* is semantically vacuous in the *event* interpretation, with the result that the verbal denotation is passed up undisturbed and can combine with the internal argument.²⁰ It is worth reiterating here that that does not mean that *n* should be omitted from the *syntactic* structure – as discussed above, event nominalizations behave syntactically and morphologically as nouns, in the case at hand, we find *-ung* as the overt exponent of *n*. This is the way in which this theory captures the dissociation between interpretations and exponents of nominalizations with a given nominalizer: both are mediated by a common, abstract syntactic structure, but can receive different interpretations at the interfaces.

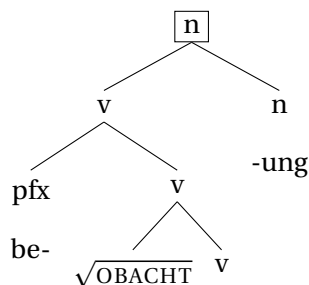
Crucially, this issue arises in a different way for the RN interpretation(s). Again following Wood (2023), I will assume that *v* is semantically vacuous in the RN interpretation. For this reason, the nominalization will be unable to take an internal argument that saturates an argument position semantically – it does not have such a position as part of its denotation, because none is introduced by *v*. As we saw in the introduction to this chapter, different readings are typically grouped under the ‘RN’ label, given their syntactically similar behavior. In what follows, I will focus in particular on the ‘result’ interpretation in the narrow sense, that is, the reading referring to the result of an event, because this reading raises a

²⁰For German event nominalizations, this analysis has an important precursor in Bierwisch 1990: p.30, where it is suggested that ‘[...] *-ung* adds nothing to the SF [Semantic Form, JB] of the Verb it nominalizes.’

particularly interesting question about the status of v in RNs.

In applying the analysis of the result reading from Wood (2023) to the result interpretation in German, we will start from the assumption that the syntactic structure of these nouns is the same as under the CEN interpretation, with the sole difference that nominalizations under this reading do not take an argument.

(66)



For the result interpretation, the alloeme of n introduces the result (with the denotation again directly taken over from Wood):

(67) $\llbracket n \rrbracket = \lambda x \exists e. \text{observe}(e) \ \& \ \text{result}(x, e)$

As is also noted by Wood (2023), on the view that the ‘result’ reading entails the occurrence of an event (as indicated by the denotation above), two distinct analytical possibilities arise. We could either assume, as is done implicitly above, that v is semantically vacuous on all readings but the CEN reading. On this view, the *event* interpretation and the *result* interpretation are mirror images of each other in terms of semantic interpretation: In the *event* interpretation, (only) v is interpreted, in the *result* interpretation, it is (only) n . However, it would be equally possible to assume that whenever there is an eventive component, it is contributed by v . On this view, in the narrow-sense ‘result’ reading, both v and n are interpreted, while some concrete object readings may still only require n to be interpreted, to the extent that they fail to entail an event of creation or similar. I will not resolve this question here, but it is worth pointing out that it also relates to another important question that we have encountered at multiple points in this chapter. If we adopt the assumption that v is semantically vacuous in all but the CEN

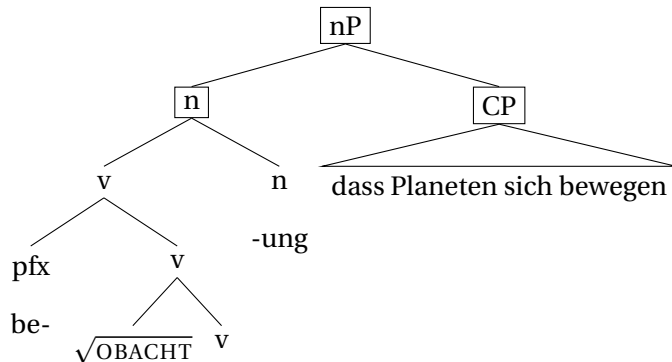
reading, then we have less clear evidence to assume that it is present at all in the nominalizations. This is in contrast to the evidence for the presence of *n* in nominalizations under the CEN reading, which determines the syntactic distribution and is therefore clearly present even when it contributes neither an contentful alloeme nor an exponent. For English and Icelandic, it is an option to address this concern by focusing on nominalizations with overt verbalizing morphemes. In German, however, there are not many overtly verbalized words, cf. section 5.1.

However, there is another morphological piece of evidence for the presence of *v* in a large number of these nominalizations, regardless of the decision sketched above regarding its semantic contribution. As I will discuss in much more detail in the following two chapters, the prefix *be-* in *be-obachten* ('observe') and *Be-obacht-ung* 'observation' is a verbal prefix and crucially generally does not attach to non-verbal categories. Thus, while *v* itself typically does not have an overt exponent in German, we can nonetheless assume that *Be-obacht-ung* must include *v* even under non-eventive readings. At the end of this section, I will return to the question of what this kind of evidence means for nominalizations that do not include a verbal prefix, and for nouns that take CP complements without an existing corresponding verb.

In extending the alloemy analysis to the content reading, the first matter of business is to make sure that the same combination of syntactic heads (*v* and *n*) with the right alloemes will on the one hand introduce the CP complement, and also semantically identify its content with that of nominalization itself.

Consider how the approach can be applied to *die Beobachtung, dass Planeten sich bewegen* ('the observation that planets move'). As we have seen, this nominalization has a *content* interpretation, where the noun *Beobachtung* refers to the content of an observation, and the CP specifies that content.

(68)



To achieve the identification of the content of the CP and the content that the noun refers to, I adopt the proposal developed in Kratzer (2006), Moulton (2013), and Zimmermann (2019) that the CP and the noun combine by Predicate Modification.²¹ Following Zimmermann, the CP is taken to have undergone a type shifting operation to be of type $\langle e, t \rangle$.

- (69)
- $\llbracket n \rrbracket = \lambda x \exists e . \text{observe}(x)(e) \ \& \ \text{content}(x)$
 - $\llbracket CP \rrbracket = \lambda x . \text{the content of } x \text{ is 'that planets move'}$
 - $\llbracket nP \rrbracket = \lambda x \exists e . \text{observe}(x)(e) \ \& \ \text{the content of } x \text{ is 'that planets move'}$

On this analysis, the *content* interpretation is like the *result* interpretation in the sense that it depends on an allosume of n , not v . Of course, this means that there must also be an allosume of v that can introduce the content interpretation in the verbal domain. Nonetheless, attributing the content interpretation to n is justified given the existence of nouns like *rumor* or *idea* where there is no corresponding verb.

- (70)
- the **fact** that the earth is round
 - the **idea** that Leonard will help Virginia
 - the **rumor** that Tom liked his own poems the best

Alternatively, and in closer analogy to the event interpretation, it may also be possible to conceive of the nouns in (70) as ‘simple’ content nouns, akin to an analysis of nouns like *trip* or *party* as Simple

²¹Within the specific proposal, the operation is sometimes taken to be Restrict, but this is to deal with a type mismatch that does not arise in the present account because the CP is introduced after the nominalization takes place.

Event Nominals (SENs). As mentioned above, the exponence of ν and n is potentially independent from their meaning. That is, just as n has different alloemes, it also has different allomorphs, with no connection between one and the other but the abstract syntactic structure.²² This helps to explain why the available interpretations of the nominalizations can depend on the Root (rather than on properties that are specific to one exponent of n). Crucially, however, in cases like *Be-obacht-ung* ('observation'), ν is still present in the structure, as evidenced by the presence of a verbal prefix. In cases like *Glaub-e* ('belief'), on the other hand, it is much less clear whether the nominalization should include ν , as there is no morphological evidence for it, and no event interpretation. I will come back to this question in chapter 5, for now, note that this is not a complication to the claim that the readings of a nominalization can all be associated to the same syntactic structure. Instead, it merely highlights that we cannot necessarily determine this on the basis of parsimony alone. As we will see throughout the dissertation, this is a more general property of alloemy analyses, and I believe that it is ultimately a desirable property, as it allows us to see which parts of the syntactic structure are independently motivated.

3.6 ALLOSEMY AND ONTOLOGY

The analysis of the ambiguity in nominalization has taken several different directions in the past three decades, of which the alloemy approach is only one. What makes the topic so fascinating is the clear intuition, shared by all researchers who have written on it, that the interpretations of words arise in different domains when Roots combine with categorizers. The domains take on different dimensions of meaning difference, some more 'intrusive' to the core meaning of the Root than others. Derivational morphology shifts the meaning of the Root in ways that seem semi-predictable at best, but that on closer inspection are more and more predictable as a wider range of grammatical factors is considered. The biggest class of approaches is what I have called the *homophony* approaches. In this class I include the syntactic approaches that Wood (2023) labels 'phrasal layering analyses', as well as approaches to nominalizations within the lexicon, which tend to rely on homophonous affixation (Grimshaw 1990; Zimmer-

²²In chapter 5, I will suggest that some nominalizers are in fact more closely associated with a specific interpretation.

mann 2019, but not Bierwisch 1990).

The phrasal layering analyses (Alexiadou 2001; Fu et al. 2001; Borer 2013; Moulton 2013 a.o.) argue that the *event* interpretation is special among the interpretations of nominalizations in including phrasal verbal structure. The basic idea is that obligatory arguments are introduced within vP before the structure is nominalized. Other nominalization, such as RNs, are taken to be smaller, usually Root-derived (though cf. Harley 2009; Alexiadou 2009, who recognize that this part of the approach faces a problem when overt verbalizers are realized in the word, as under a result reading of *nominalization*). Apart from v, *event* nominalizations are sometimes argued to include other verbal projections, such as Voice. On this view, *event* nominalizations are big, and *result* nominalizations are small. The *content* interpretation is usually not discussed, except in Moulton (2013), where it is argued to be Root-derived (thus patterning with the ‘result’ nominalizations). The strongest argument against this class of approaches is that it is accidental that the ‘big’ and the ‘small’ structure are pronounced the same way (cf. Wood 2023). These approaches also predict that vP modifiers should be able to appear within nominalizations. Fu et al. (2001) argue that this prediction is correct on the basis of examples like (71):

(71) The occurrence of the accident suddenly (disqualified her)

This sentence is of course indeed grammatical if the brackets are taken out and *suddenly* is taken to modify *disqualified her*, but the reading that Fu et al. are after is one in which *suddenly* modifies the vP within *occurrence*. Speakers of English tend to disagree with this judgment. Note that the polysemy approach does not predict that vP modifiers should be available – while the nominalization structure includes *v*, that head is immediately combined with another head, and no vP adjunction site is created. Empirically, Wood’s main argument against the phrasal layering analysis for Icelandic is the case marking pattern within the DP: Phrasal layering predicts ‘low’ datives (inherent case) on the internal argument to surface within the DP, which, in Icelandic, they do not. For German, the applicability of this argument is limited because there are not many transitive verbs that govern the dative in the first place, and of those, a smaller set that allows eventive nominalizations. One suggestive example might be *Begegnung* (‘encounter’).

- (72) a. Der Mann begegnete seinem Sohn im Café.
 the man encountered his.DAT son in.the café
 The man encountered me in the café.
- b. *Die Begegn-ung seinem Sohn dauerte drei Minuten.
 the encounter-NMLZ his.DAT son took three minutes
- c. *Die Begegn-ung seines Sohns dauerte drei Minuten.
 the encounter-NMLZ his.GEN son took three minutes
- d. Die Begegn-ung mit seinem Sohn dauerte drei Minuten.
 the encounter-NMLZ with his.DAT son took three minutes
 ‘The encounter with his son took three minutes.’

The verb *begegnen* (‘encounter’) governs the dative, but the nominalization allows neither retention of the dative nor a genitive internal argument – only a PP is possible (within the PP, the preposition independently assigns dative). Compared to Icelandic, this might suggest that the case argument is inconclusive in German, but it is still worth noting the absence of evidence for phrasal verbal syntax in these contexts.

Aside from the polysemy and homophony approaches, I will mention a third type of approach here, recently proposed in Moltmann (2020a, 2020b), that we might call the ‘categorical’ or ‘ontological’ approach. Moltmann argues that some of what I have described as an ambiguity between, in particular, the *event* and the *content* reading, is not ambiguity at all, but rather reflects the properties of a different underlying ontological category, the class of *attitudinal objects*. The attitudinal objects include *products*, such as *claim* and *thought*, taken to be the product of an act of claiming or thinking, respectively, and *mental states* such as *belief*. One motivation for Moltmann’s analysis is that attitudinal objects can be identified with their content; a *claim*, for example, can not just be *loud*, but also *partially correct*. This, of course, is essentially what I have been calling the *content* interpretation, with one big and crucial difference: On the allosemy analysis (and any other polysemy analysis), a given instance of a nominalization is predicted to have the *content* interpretation or a different interpretation, but not both at the same time. On Moltmann’s analysis, the *content* properties are just properties of attitudinal objects, which can also have concrete or event-related properties. Let’s assume that the predicate *is correct* disambiguates

towards the *content* interpretation, while the adjective *thorough* disambiguates towards the *event* interpretation. Polysemy accounts predicts that combining the two should have odd results.

- (73) a. ?the thorough observation (that the earth is round) is correct
 b. ?the thorough observation (of the earth) is correct

Informants report that these sentences are deviant, which is predicted under the polysemy approach, but not under Moltmann's analysis. That said, I have not addressed the ontological status of *content* here except to treat it as an entity. In this I follow Zimmermann (2019) in particular, who argues that the identification of the content noun and the content of the CP is made possible by shifting the CP to be of type $\langle e, t \rangle$, as I also assumed above. In Zimmermann's analysis, the type shift introduces a CONTAIN function:

- (74) TS: $\lambda p \lambda x [\text{CONTAIN } (x) (p)] \in \langle s, t \langle e, t \rangle \rangle$ (Zimmermann 2019)

I have implicitly assumed a similar contribution above. According to Zimmermann, the CONTAIN function could also be paraphrased as 'x consists of p'. On the face of it, 'containing' and 'consisting of' seem conceptually separate, but turning back to the examples in (59), there does seem to be an affinity between the two in their linguistic behavior. Relatedly, consider the fact that even physical containers have a similar ambiguity:

- (75) Jane poured a glass over her head. (Rolf Noyer p.c.)

The subtleties of Zimmermann's claim may well prove important for the comparison of this conception of content nouns and Moltmann's attitudinal objects, especially when it comes to the commonalities between conceptually different types of content nouns, like *claims* and *hopes*. This of course invites future investigation into the the semantic and ontological status of content, also see Elliott (2020) for discussion.

The study of word formation and word meaning faces special challenges where form-meaning map-

pings are not one to one. One such domain is the pervasive ambiguity in nominalizations. This chapter of the dissertation contributes to the study of this domain by bringing German nominalizations under the content reading to bear on broader questions of polysemy, the syntax-semantics interface, and a theory of derivational morphology. I argued for a polysemy account to nominal ambiguity, based on allosemy of *v* and *n* in nominalization structures. The broader suggestion is that allosemy approaches afford the right amount of flexibility to the interpretation and structural configuration of nominalizations, and on meaning composition in derivational morphology more generally.

However, we also saw that various questions are raised by this analysis: Does allosemic interpretation (in general, or of a specific kind) only apply in complex head adjunction structures? What are we to make of the asymmetric evidence regarding the presence of *n* in event nominalizations (strong evidence), and the presence of *v* in RNs and under the content reading (evidence on a case-by-case basis)? How uniform is the syntactic structure of various nominalization patterns in a given language? Is it safe to assume that all verbal prefixes diagnose a verbal basis for nominalization, and how do they themselves influence the interpretation of the Root? It is this last set of questions surrounding prefixation that I turn to in the next chapter. Following a general study of the syntax and interpretation of preverbal elements in chapter 4, chapter 5 will bring the results of that study back into the context of nominalization, allowing us to take a second look at the complex interplay of syntactic and interpretative properties in morphologically complex structures.

4

PREFIXES, PARTICLES, AND RESULTATIVES

4.1	CO-OCCURRENCE RESTRICTIONS	88
4.2	THE SYNTAX AND SEMANTICS OF RESULTATIVES	94
4.3	PREFIXES AND PARTICLES: SYNTAX AND IN- TERPRETATION	107
4.4	PREVERBAL ELEMENTS: STRUCTURE AND INTERPRETATION	133
4.5	DISCUSSION	139

Preverbal elements constitute a particularly pertinent domain of investigation of German derivational morphology that connects the morphology to its syntactic context and its interpretation. A large portion of verbs in German occur with a preverbal element in close union with the verb Root. The resulting complex verb typically consists of a Root that is independently found in a stand-alone verb (although this is not always the case, cf. section 4.3.1), combined with a preverbal element such as a prefix or particle that shifts the meaning of the verb, as well as grammatical properties pertaining to argument

structure and event structure, with varying degrees of opacity.

For German, the particular phenomenon of separability of these elements, i.e. their behavior under head- and phrasal movement, is well-studied from a syntactic perspective (see Wurmbrand 1998; Zeller 2001a; Vikner 2005; Murphy 2021 a.o.), and their interpretation and argument-structural properties are well-studied as a matter of lexical semantics (see e.g. Wunderlich 1983, 1987, 1997; Stiebels 1996), although, as we will see, both their syntax and interpretation also have properties that continue to be puzzling. The basic syntactic observation is that preverbal elements in German (and other Germanic verb-second languages) are either fronted with the verb under V2 (76a), or are left behind in the verb's clause-final base position (76b). The latter class of separable preverbal elements is often referred to as the class of *particles*. I will adopt this terminology to aid readability, for more discussion on the syntactic category of these elements, see section 4.3.1. (76c) provides an example of the unprefixated base verb and its arguments for comparison.

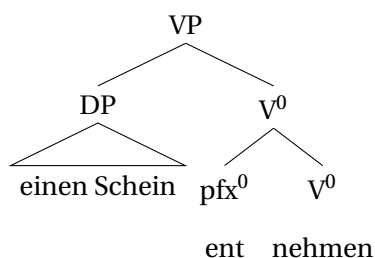
- (76) a. Jonas **ent-nimmt**_I seinem Portemonnaie einen Schein ___₁
 Jonas ENT-takes his.DAT wallet a.ACC bill
 'Jonas is taking a bill out of his wallet'
- b. Mein Nachbar **nimmt**_I das Paket **an-** ___₁
 my neighbor takes the.ACC package AN
 'My neighbor will accept the package'
- c. Caro **nimmt** (sich) einen Keks (aus der Dose)
 Caro takes (REFL) a.ACC cookie (out.of the.DAT jar)
 'Caro takes a cookie (from the jar) (for herself)'

As this initial example already demonstrates, a given Root can appear with several different prefixes and particles to yield different interpretations. The example also already shows that prefixes and particles can contribute to the verb's interpretation and argument structure in ways that seem quite similar in terms of grammatical function and degree of transparency (approximate literal translations of *ent-nehmen* and *an-nehmen* are 'take out' and 'take on', respectively). This is important because it means that an analysis that posits distinct syntactic structures for the two kinds of elements to account for their distinct syntactic behavior will have to explain to what extent their interpretation is also affected

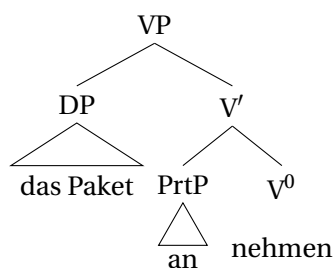
by these syntactic structures. A simplistic generalization along the lines of ‘prefixes are opaque, particles are transparent’ is incorrect and should not be a desideratum of the analysis, much less a prediction (cf. Zeller 2001a: ch.2, fn.6). Throughout this chapter, prefixes and particles are consistently unglossed, even where they arguably contribute a meaning that is transparently related to that of a preposition, to avoid the implication that this transparent meaning surfaces reliably. This issue is further discussed in section 4.3.2.

Analyses of the phenomenon of separability vary among different dimensions, including empirical coverage, the assumed category of the prefix or particle, a syntactic or lexical locus of prefixation, and the syntactic position of the direct object. Several analytical possibilities will be sketched in this chapter. As a representative illustration of the kinds of questions that arise, consider briefly an influential account by Wurmbrand (1998). Wurmbrand argues that the difference between separable prefixes and inseparable particles follow from a phrase-structural difference: Inseparable prefixes are part of complex (verbal) head,²³ while separable prefixes are merged as a phrasal sister to the verb.²⁴

(77) Inseparable prefixes



(78) Separable particles



This analysis gives a straightforward account of the separability and inseparability in the verbal domain: Assuming a ban on excorporation (cf. Baker 1988), it explains why V2-movement, as a head movement operation, strands the particle, but takes along the prefix by virtue of it being part of a complex head. I will argue below that Wurmbrand’s analysis is basically correct in this crucial respect. However,

²³For Wurmbrand, this head is formed through movement, I abstract away from this part of the proposal for expository purposes.

²⁴Here and throughout, I sometimes use the term ‘head’ in the sense of ‘not phrasal’, this is not a claim about the headedness of the structure, cf. section 4.3.1.

several issues beyond the head/phrase distinction are raised by this phenomenon, and the analysis itself raises further questions as well, including about the head/phrase distinction itself. As we will see below, particles display mixed behavior when it comes to different criteria that have been proposed to distinguish heads and phrases, both in terms of their morpho-syntax and in terms of their interpretation. In this long-standing debate, I will come down on the side of a phrasal analysis of particles. Building on Zeller (2001a), I will also propose that the interpretation of less-than-transparent particle verbs requires the application of allosemy, as does the interpretation of prefix verbs. Particle verbs, I argue, are especially well-suited to enrich our understanding of the locality domains of allosemy in complex heads and beyond. With Zeller (2001a), I will argue that the syntactic and interpretative properties of particles are most compatible with an analysis that takes them to be phrasal, but lacking in any functional structure above the particle itself. This puts them into the domain of allosemic interpretation that is required to derive non-transparent particle verbs. Note that the issues raised in this respect extend beyond theory-internal concerns regarding allosemy: Any analysis of particle verbs requires a commitment as to how verb Root and particle can be interpreted together, including in contexts where they are syntactically separated by V2-movement (or any other process).²⁵

To contextualize and substantiate this account, this chapter also considers another – unambiguously, if not uncontroversially – phrasal structure that has been argued to speak to the syntactic structure and interpretation of prefixes and particles: resultative secondary predicates (RSPs), a typical example of which is given in (79).

- (79) Er hämmerte das Metall platt
 he hammered the.ACC metal flat
 ‘He hammered the metal flat’

To see how RSPs fit into the paradigm of preverbal elements, consider the following examples:

²⁵There is another pressing question that arises in this connection: Does the phrasal status of particles call the complex head analysis of nominalizations from chapter 3 into question, given that particle verbs can be nominalized? This question is taken up in chapter 5.

- | | | |
|------|---|----------------------|
| (80) | <p>a. Er schießt (auf seinen Gegner)
 he shoots (at his.ACC opponent)
 'He shoots (at his opponent)'</p> | <i>simplex verb</i> |
| | <p>b. Er er-schießt *(seinen Gegner)
 he ER-shoots his.ACC opponent
 'He shoots his opponent dead'</p> | <i>prefix verb</i> |
| | <p>c. Er schießt *(seinen Gegner) an
 he shoots his.ACC opponent AN
 'He hits his opponent with a shot'</p> | <i>particle verb</i> |
| | <p>d. Er schießt *(seinen Gegner) tot
 he shoots his.ACC opponent dead
 'He shoots his opponent dead'</p> | <i>resultative</i> |

In a pattern that is repeated for many other simplex verbs and their derivatives, the simplex verb *schießen* 'shoot' is intransitive, an argument may be added as a PP, but is entirely optional. In contrast, the prefix verb, particle verb, and resultative all require an obligatory direct object, in this case a Theme (80b-d). While this is a representative pattern, it is important to keep in mind throughout that it is not the case that all simplex verbs in German are intransitive (let alone unergative), nor do all preverbal elements introduce additional arguments, or correspond to a consistent thematic structure. Sections 4.2 and 4.3.1 discuss the systematicity of the changes in argument structure for resultatives and prefix/particle verbs, respectively. I will argue that in addition to the separability facts, two core observations emerge in this space that should be covered by any analysis of the syntax and semantics of preverbal elements:

1. Preverbal elements typically cannot co-occur, with the exception of certain *particle+prefix+verb* combinations.
2. All three kinds of preverbal elements frequently have the property of manipulating the argument structure of the base verb: prefixes and RSPs typically occur with obligatory direct objects, particles have more diverse effects.

While previous research has typically focused on pairwise comparisons rather than the three-way comparison undertaken in this chapter (a notable exception is Wunderlich 1997), we can nonetheless

identify at least three strands of research in the previous literature that have in some way attempted to connect the first observation to an analysis of the second (even if the data under consideration are delimited differently by different researchers). The first tradition claims that preverbal elements may *transitivize* a verb in the lexicon, the co-occurrence restrictions then follows from lexical principles such as a ban on multiple transitivizations (cf. Müller 2002) or related constraints on lexical semantic representations (Stiebels and Wunderlich 1994; Kaufmann 1995; Stiebels 1996; Wunderlich 1997). The second family of analyses hold that all three preverbal elements are in templatic competition for the same position in the syntax, most typically, these analyses claim that all these elements are the heads of or otherwise contained in small clause (SC) structures: this allows them to introduce an argument as the small clause subject or complement, and potentially prevents them from co-occurring (cf. Kayne 1985; Hoekstra 1988; den Dikken 1995; Kratzer 2005; Koopman 2010,²⁶ but see also Keyser and Roeper 1992; McIntyre 2004; Haider 2016, for non-SC templatic accounts). The third type of analysis argues that the reason for the incompatibility of multiple preverbal elements lies in the fact that they tend to *delimit* the event described by the verb, i.e. introduce an end state to the event into the semantics (cf. Tenny 1987, 1994; Creemers 2020). Crucially, a given event can only be delimited once, leading to the observed co-occurrence restrictions on this view.

However, it has independently been convincingly argued by various authors that the transitivization analysis, the templatic/SC analysis, and the semantic delimitation analysis are all wrong for at least a subset of the preverbal elements (cf. Carrier and Randall 1992; Neeleman and Weerman 1993; Wurmbrand 1998; Zeller 2001a, 2001b; Embick 2004; Kratzer 2005; A. Williams 2015; Haider 2016; Creemers 2020 a.o.). Crucially, all three types of analyses cease to cover the empirical pattern as soon as they are shown to be incorrect for even just some structures with preverbal elements. For example, the explanation that the co-occurrence restrictions are the result of the incompatibility of more than one SC per verb breaks down immediately if even just some of the preverbal elements are not represented as SCs, as we would then predict that at least one non-SC-internal element and one SC might co-occur. As I show in this chapter, for German in particular there is little reason to believe that the small clause analysis

²⁶Kratzer's analysis is an SC-analysis in spirit only, see section 4.2.1.

is correct for any of the preverbal elements under consideration. More generally, I will argue that the preverbal elements defy a completely unified analysis, and that this is in fact preferable, as it predicts the systematic gap in the co-occurrence restrictions (PRT-pfx-verb), and allows us to account for differences in their behavior under nominalization (see chapter 5). Instead of endorsing a one-factor analysis, I will argue that both phrase-structural conditions and a ban on double delimitation do in fact play a role in producing the observed pattern. From this perspective, the restrictions result from independent syntactic and semantic principles.

The chapter begins by detailing the co-occurrence restrictions between prefixes, particles, and RPSs in the next section. Sections 4.2 and 4.3 give some more background on RSPs and prefixes/particles, respectively, and analyze their argument structure and syntactic separability. Section 4.4 brings these pieces together in an analysis of the co-occurrence facts, and highlights the similarities and differences in the interpretative properties of the structures in terms of allosemic interpretation, defending the following main claim:

Claim 1: The co-occurrence restrictions between prefixes, particles, and RSPs and their respective argument-structural properties are best understood as arising from a combination of independently motivated phrase-structural considerations and a ban on multiple end states for a single event.

In addition, I will argue that framing the analysis in terms of conditions on allosemy in the domain of complex predicates sheds light on the ways in which interpretative properties are affected by preverbal elements as follows:

Claim 2: Allosemy offers a way of understanding the interaction of preverbal elements and the base verb. Locality conditions on allosemy explain why RSPs seem to interact with the verb for argument introduction, but are always interpreted transparently, while prefix- and particle verbs can receive non-transparent interpretations.

Following the analysis, section 4.5 connects these phenomena back to a discussion of allosemy and complex word formation more generally, and sets the stage for the final case study in chapter 5.

Preverbal elements have long featured prominently in the discussion of the relationship between lexical semantics and syntactic word formation in investigations of German. The complex relationship between opaque and transparent meaning shifts introduced by prefixes and particles, combined with the syntactic behavior of these elements, is challenging on some level to any theory of word formation. Bringing resultative secondary predicates into the same discussion highlights these tensions, and sheds light on the availability and plausibility of a wide range of analytical options. In the context of this dissertation, this case study serves as a further point of connection with the previous literature on derivational morphology in German, as well as a natural continuation of the investigation of the issues of complex head formation raised in the previous chapter, and a prerequisite for the study of prefixed nominalizations in the final case study.

4.1 CO-OCCURRENCE RESTRICTIONS

This section anchors the chapter by illustrating the co-occurrence restrictions between the three types of preverbal elements. As we will see, most combinations of prefixes, particles, and RSPs are generally ruled out (although there are some limited exceptions for most pairwise combinations, which are discussed in section 4.5.1). The only combination that is more widely available is *particle+prefix+verb*, in that order.

Starting with the combination of multiple inseparable prefixes, we see that this is almost entirely impossible. (81) gives a few examples of plausible but ungrammatical verbs with more than one prefix (this is of course only a small snippet of all conceivable but non-existing verbs).

(81) **pfx-pfx-verb*

- a. **ent-ver-trauen* (cf. *ver-trauen* ‘trust’, intended: stop trusting)
- b. **ver-be-laden* (cf. *be-laden* ‘load’, intended: wrongly load)
- c. **ent-zer-legen* (cf. *zer-legen* ‘cut to pieces’, intended: put back together)

Moving on to combinations of more than one separable particle, we see that this too is generally ruled out. Stiebels and Wunderlich (1994) provide (82a) as an example of a combination that would be perfectly plausible semantically, but is nonetheless entirely ungrammatical. Note that this example features a particle of category N – whether some nominal and adjectival elements should be classified as particles is controversial in this literature (see section 4.3.1 for some discussion of particle category), but it is particularly easy to imagine what the particle verbs using these elements would mean if they were available. However, it is also possible to adduce examples as in (82b,c) with (uncontroversial) prepositional particles.

(82) *PRT-PRT-verb

- a. *rad-ein-fahren (cf. *rad-fahren* ‘ride a bike’, *ein-fahren* ‘drive in’, intended: ride in on a bike)
- b. *an-auf-sagen (cf. *auf-sagen* ‘recite’, intended: start to recite)
- c. *um-aus-suchen (cf. *aus-suchen* ‘choose’, intended: change a selection)

We have seen that prefixes and particles cannot be iterated. Strikingly, one prefix and one particle *can* occur together, although generally only if the prefix is closer to the Root. The reverse order, with the particle occurring closer to the verb, is ruled out (with some very limited exceptions, which are discussed at the end of this chapter). (83) gives a snapshot of the conceivable but entirely ungrammatical verbs in this category.

(83) *pfx-PRT-verb

- a. *zer-ab-schneiden (cf. *ab-schneiden* ‘cut off’, intended: cut off into strips)
- b. *ent-auf-setzen (cf. *auf-setzen* ‘put on’, intended: take off)
- c. *ver-ein-laden (cf. *ein-laden* ‘invite’, intended: invite mistakenly)

In the order PRT-pfx-verb, however, we find a strikingly different picture. This combination is much more widely attested than any of the others, and the verbs in this class do not share the irregular character of the limited exceptions in the other classes.

(84) *PRT-pfx-verb*

- a. aus-er-wählen ('choose', cf. *er-wählen* 'pick')
- b. an-ver-trauen ('entrust', cf. *ver-trauen* 'trust')
- c. vor-ent-halten ('withhold', cf. *ent-halten* 'contain')
- d. um-ent-scheiden ('redecide', cf. *ent-scheiden* 'decide')
- e. ab-er-kennen ('deprive', cf. *er-kennen* 'recognize')
- f. ...

It is important to note at this point that the *particle+prefix+verb* order is not entirely unrestricted either, that is, it is possible to conceive of *PRT-pfx-verbs* that are not available.

(85) *some *PRT-pfx-verbs*

- a. *um-er-wählen (*er-wählen* 'select', intended: change selection)
- b. *nach-ent-halten (*ent-halten* 'contain', intended: contain after)
- c. *ab-zer-schneiden (*zer-schneiden* 'cut into pieces', intended: cut off into pieces)
- d. *ein-ver-laden (*ver-laden* 'load', intended: load into)

Of course, in the domain of derivational morphology, such restrictions are not unexpected. The claim here is that the *PRT-pfx-verb* order is different from the others in not being ruled out *in general*. Reasons for the non-existence of specific verbs in this class may reach from the accidental (a verb does not have a conventionalized meaning in spite of being generable by the grammar, e.g. (85a-b), cf. Halle 1973; Embick 2016; Embick et al. 2023 for related ideas) to the principled (some verbs in this class will fall under the ban on multiple end states in a single event, e.g. (85c-d)).

Having established that prefixes and particles typically cannot co-occur (except in *PRT-pfx verbs*), we now turn to resultative secondary predicates (RSPs). As in English, multiple RSPs are impossible in German, (86).

(86) a. *She wiped the table dry clean

(Tenny 1987)

- b. *Sie hat sich kaputt müde gearbeitet
 she has REFL broken tired worked.PTCP
 intended: 'She worked herself to complete exhaustion'

Depending on the syntactic analysis of RSPs, the fact that they cannot be iterated may not be surprising (cf. section 4.2). However, as Haider (2016) and Creemers (2020) stress, prefixes and particles are just as incompatible with RSPs (see also Kayne 1985; Hoekstra 1988; Neeleman and Weerman 1993; Tenny 1994 for related claims about Dutch and English). As not all conceivable RSP+verb combinations are possible in the first place, the following examples from Creemers (2020) contrast the ungrammatical **RSP pfx-verb* sequences with the grammatical *RSP verb*.²⁷

(87) **RSP pfx-verb*

- a. *Sie haben uns arm be-raubt
 they have us.ACC poor BE-robbed.PTCP
 'They robbed us poor'
- b. Sie haben uns arm geraubt
 they have us.ACC poor robbed.PTCP
 'They robbed us poor'
- c. *Sie haben ihn tot er-schossen
 they have him.ACC dead ER-shot.PTCP
 'They shot him dead'
- d. Sie haben ihn tot geschossen
 they have him.ACC dead shot.PTCP
 'They shot him dead'
- e. *Hans hat den Stock kaputt zer-brochen
 Hans has the.ACC stick broken ZER-broken.PTCP
 'Hans broke the stick broken'
- f. Hans hat den Stock kaputt gebrochen
 Hans has the.ACC stick broken.ADJ broken.PTCP
 'Hans broke the stick broken'

Finally, RSPs and particles are also incompatible (the grammatical examples are again intended to set a

²⁷Note that *ge-* in the grammatical examples is not a prefix in the relevant sense, but rather a part of the regular participle form for verbs with initial stress, cf. section 5.4.

baseline, since not all conceivable verb+RSP combinations are grammatical).

- (88) a. Sie hat den Tisch trocken gewischt
 she has the.ACC table dry wiped.PTCP
 ‘She wiped the table dry’
- b. *Sie hat den Tisch trocken ab-gewischt
 She has the.ACC table dry AB-wiped.PTCP
 intended: ‘She wiped the table off dry’²⁸
- c. Das Baby hat mich nass gespuckt
 the baby has me.ACC wet spit.PTCP
 ‘The baby spat up on me’
- d. *Das Baby hat mich nass an-gespuckt
 the baby has me.ACC wet AN-spit.PTCP
 intended: ‘The baby spat up on me and I was wet as a result’
- e. ?Sie haben nichts kaputt gereinigt
 they have nothing.ACC broken cleaned.PTCP
 ‘They didn’t break anything by cleaning it’
- f. *Sie haben nichts kaputt vor-gereinigt
 they have nothing.ACC broken VOR-cleaned.PTCP
 ‘They didn’t break anything by pre-cleaning it’ (Haider 2016)
- g. Sie hat sich müde gereist
 she has REFL tired traveled.PTCP
 ‘She traveled herself tired’
- h. *Sie hat sich müde nach-gereist
 She has REFL tired NACH-traveled.PTCP
 ‘She traveled herself tired following someone’

Crucially, this co-occurrence restrictions holds for so-called resultative particles (cf. (88b)), but also for all other particles. The particle *an-* in (88d) is less clearly a ‘resultative’ particle than *ab-* in (88b), and the particles in (88e-h) are not in any way characterizable as resultative.

As briefly discussed in the introduction, the previous literature has frequently proposed a single cause for these co-occurrence restrictions, but this is inadequate when the full paradigm is considered. I will argue that both semantic and (morpho-)syntactic constraints are at work in producing the overall

²⁸Unlike in English, this sentence is in fact grammatical in German under an adverbial reading of *trocken* (‘dry’). This is not the intended reading here.

picture sketched above. Table 3 summarizes the restrictions enumerated above, as well as whether they will turn out to be predicted from the syntax or interpretation of the structure, respectively. As the table demonstrates, I will argue that these reasons *cross-cut* the three types of elements under consideration, such that it is necessary to compare all three, even if the results of that comparison do not point to a single underlying cause for the restrictions. A check mark in parentheses indicates that the predictions depend on the specific particles involved.

	Allowed	Structure Predicts	Interpretation Predicts
px-px	✗	✓	✗
px-PRT	✗	✗	(✓)
PRT-px	✓	✓	(✓)
PRT-PRT	✗	✗	(✓)
RSP-px	✗	✓	✗
RSP-PRT	✗	✗	(✓)
RSP-RSP	✗	✗	✗
px/PRT-RSP	✗	✗	✗

Table 3: Co-occurrence restrictions.

Strikingly, phonological, lexical, syntactic and semantic factors for these restrictions have been argued to be relevant in the literature, recruiting every component of the grammar. Typically these explanations have been advanced only in pairwise comparison, that is, either limited to prefixes and particles, or to resultatives and particles, or (less commonly) to prefixes and resultatives. As mentioned in the introduction to this chapter, some of these analyses appeal to the idea that the lexicon can block the the application of multiple argument structure affecting processes. Others make use of the idea that prefixes, particles, and resultatives, or some subset thereof, compete syntactically for a single position, most typically the head of a small clause. Yet other proposals emphasize the event-delimiting effect of many preverbal elements and suggest that they cannot co-occur because each event can only be delimited once.

As we will see below, all of these proposals have their merits, but they also have issues: none of them

captures the full paradigm, nor are they easily compatible with one another in the forms in which they have been proposed. Neither of these issues calls into question the overall plausibility of several of the ideas involved (roughly: a syntactic complexity restriction, a head-vs-phrase distinction, a connection to argument introduction, and a semantic complexity restriction), they merely highlight that there remains work to be done in combining these components to achieve greater empirical coverage and theoretical cohesion. As a first step, the following sections will establish some basic (and some not-so-basic) facts about resultatives (section 4.2) and prefixes and particles (section 4.3), respectively. Rather than provide full syntactic and semantic analyses of the phenomena, these sections will point out the facts that a successful analysis must capture, and draw conclusions about valid analytical possibilities. The most important result of this comparison is that prefixes, particles, and resultatives share many structural and interpretative properties, yet resist a completely unified analysis both syntactically and semantically. As will become clear, the reason for starting with the resultatives is twofold: First, although resultatives have been a complicated and fruitful topic in research on event- and argument structure, they form a more coherent class than prefix- and particle verbs due to their higher level of interpretative transparency, and are thus easier to characterize. Secondly, the analysis of resultatives that I adopt in the next section will inform the analysis of prefix and particle verbs. We will then see how these components can be combined in section 4.4.

4.2 THE SYNTAX AND SEMANTICS OF RESULTATIVES

This section builds a background for the discussion of resultative secondary predicates (RSPs) in German. The most important aspect in the analysis of resultatives is that they contain two predicates: the verb, sometimes referred to as the Means (or Manner) predicate *M*, and an additional XP, the result predicate *R*. Crucially, *M* and *R* are obligatorily understood to form a complex event (rather than contributing two independent events). Consider the examples in (89), repeated from various points in the previous section.

- (89) a. Er hämmerte_M das Metall platt_R
 he hammered the.ACC metal flat
 'He hammered the metal flat'
- b. Er schießt_M seinen Gegner tot_R
 he shoots his.ACC opponent dead
 'He shoots his opponent dead'
- c. Das Baby hat mich nass_R gespuckt_M
 the baby has me.ACC wet spit.PTCP
 'The baby spat up on me'
- d. Hans hat den Stock kaputt_R gebrochen_M
 Hans has the.ACC stick broken broken.PTCP
 'Hans broke the stick'

These examples show the two word order possibilities for RSPs in German. In (89a-b), the inflected verb moves to C under V2, while the adjectival RSP remains in its clause-final base position. In (89c-d), the verb (now in the form of the past participle) and the RSP are adjacent in clause-final position. In both orders, the direct object immediately precedes R.

Two notes on the category of the R predicate in resultatives are in order. First, note that DP resultatives, which are available to a very limited extent in English, are out entirely in German (Müller 2002).

- (90) a. He sprayed his car a brilliant shade of green (Rothstein 1985: p.81)
- b. *Er sprühte sein Auto einen schönen leuchtenden Grünton
 he sprayed his car a beautiful luminous shade.of.green

Secondly, while the remainder of the chapter will focus on AP resultatives in particular, certain kinds of PP resultatives are in principle relevant as well. However, I will assume that not all PPs that have cropped up in the resultatives literature are in fact relevant to the discussion (Rothstein 2004; A. Williams 2015; Biggs 2019 and compare Maienborn 2001). Directional PPs in particular are systematically different from 'real' resultative PPs and AP resultatives in some key ways.

- (91) a. Tracy ran [_{PP}to the library]
- b. Mary waltzed John [_{PP}across the room]

As has been pointed out in various places in the literature, examples such as (91) have the potential to undermine several otherwise robust generalizations about resultatives. For example, (91a) is subject-oriented, while resultatives are always object-oriented in English and German (see below), and it has been argued that the events of *running* and *getting to the library* can be independently modified by adverbs (Rappaport Hovav & Levin 2001), a property not otherwise found with resultatives (cf. A. Williams 2015 and below). Biggs (2019) shows that even (91b), which is on the surface more similar to canonical resultatives, is syntactically clearly distinct. For example, the verb and object in uncontroversial resultatives do not pass constituency tests such as *do so* substitution to the exclusion of the RSP, while they do appear to form a constituent to the exclusion of a directional PP, cf. (92) (see Biggs 2019 for other tests).

- (92) a. *Mary sang her throat hoarse, and John did so scratchy
 b. Mary waltzed John around the ballroom, and Sarah did so around the garden

For German, an additional source of suspicion towards a unified analysis of resultatives and directional PPs comes from the fact that resultatives with so-called unselected objects (cases in which the object found in the resultative is not selected by the base verb on its own, such as *her throat* in (92a), cf. section 4.2.1) are more widely available in German than in English, while directional PPs with unselected objects are *less* widely available, for example, (93) is not grammatical in my German (see Biggs 2019 for some discussion of this point of variation).

- (93) *Maria tanzte Hans durch das Zimmer
 Maria danced John.ACC through the room
 'Mary danced John through the room'

This is not to say that there is no connection between resultative constructions and directional PPs. It has frequently been argued that both fall into a class of phenomena linked to Talmy's typology of verb-framed and satellite-framed languages (cf. Talmy 1975; Snyder 2001; Ramchand 2008; Beavers 2012; Folli and Harley 2020 a.o.). While a more comprehensive discussion of the cross-linguistic implications is outside of the scope of this dissertation, I take the contrasts above to be a cause for caution against

insisting on too tight a link (or identity) between these structures. Crucially, this note of caution does not necessarily apply to PP resultatives as in (94):

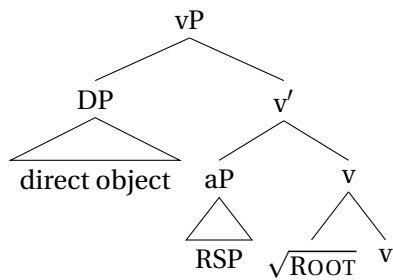
- (94) a. He hammered the metal [PP to pieces]
 b. Er hat das Tuch [PP in Stücke] geschnitten
 he has the.ACC cloth in pieces cut.PTCP
 ‘He cut the cloth to pieces’

While only a small number of such PP resultatives exists in either language, they are not subject to the concerns noted above. As AP resultatives clearly form the core of admissible resultative constructions in both English and German, especially once directional PPs are excluded, I will focus on them from here on out. However, it is worth keeping in mind that PPs (both directional and resultative) are relevant to two questions that are of interest in the present study: if it were the case that the restrictions in section 4.1 were *purely semantic*, we would expect PPs to pattern with prefixes, particles, and APs, to the extent to which they are all semantically similar in denoting states that delimit the event, and to pattern differently to the extent that they do not. Conversely, if the patterns in 4.1 were *purely syntactic*, we might expect that PPs pattern with other phrasal elements, or with other elements of category P (prefixes and particles have been argued to be of category P, see section 4.3.1). I will return to this point of comparison in section 4.4.

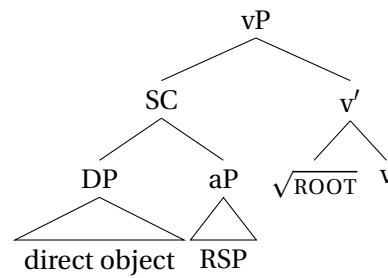
Resultatives have typically received one of two main analyses syntactically. The first family of analyses posits a type of complex predicate consisting of the M and R predicates (for German, see Rapp 1997; Lüdeling 2001; Haider 2016; Creemers 2020, and cf. Neeleman and Weerman 1993; Neeleman 1994; Winkler 1997; Embick 2004; A. Williams 2015 for related proposals for English and Dutch). The second family instead argues instead for a type of small clause structure, with the M predicate embedding a small clause containing the Theme and the R predicate (for German, see von Stechow 1995, 1996, and cf. Hoekstra 1988; Kratzer 2005²⁹ a.o.). The two approaches are schematized in (95) and (96).

²⁹As noted above, Kratzer’s analysis has features of both the complex predicate and the SC analysis.

(95)



(96)



In the following subsection, I will selectively compare some of the arguments for and components of a complex predicate analysis, while also briefly summarizing the appeal of the SC analysis and some reasons to reject it. Some important issues in the syntax and especially the semantics of resultatives will be set aside in this discussion, since my main objective is to establish a point of comparison with prefixes and particles in the remainder of the chapter. For this comparison, three points are of particular interest and should be kept in mind, with the third a point of synthesis of the first two:

1. the general interpretation of resultatives with respect to the events involved
2. the extent to which the direct object in a resultative should be considered an argument of the R predicate (in addition to, or opposed to, the M predicate)
3. the extent to which RSPs manipulate the event and argument structure of the M predicate

I will mostly set aside *lexical* proposals in the vein of complex predicate analyses (cf. Kaufmann 1995; Wunderlich 1997), for the simple reason that resultatives have never fit comfortably into the purview of the lexicon, given that RSPs can clearly be phrasal (cf. Rapp 1997; Embick 2004 on this point).

(97) R can be phrasal

- a. hammered flatter than a pancake
- b. flacher als einen Pfannkuchen gehämmert
flatter than a pancake hammered
- c. total flach gehämmert
totally flat hammered

- d. noch flacher gehämmert
even flatter hammered

Some lexical analyses take this into account by applying a resultative-forming rule to the verb in the lexicon, but combining it with the RSP in the syntax (cf. Wunderlich 1997; Müller 2006). It is sometimes argued that the restricted availability of specific combinations of M and R predicates prohibits a syntactic analysis (cf. Boas 2000), this kind of argument will not be discussed in detail. However, there is an arguably more important insight that is made sense of under the lexical analysis: the fact that RSPs are more closely integrated into the event- and argument structure of the predicate than depictives, manner adjuncts, directional PPs and so on. This fact can and should play a role in adjudicating between syntactic analyses of resultatives.

4.2.1 COMPLEX PREDICATES AND SMALL CLAUSES

A successful analysis of resultatives must provide a way to account for their somewhat peculiar event- and argument-structural properties. Regarding the event structure, the most important and puzzling fact about resultatives is that the events denoted by the M predicate and the R predicate must be tightly linked or composed in a way that does not automatically follow, given that they are expressed separately syntactically. Regarding the argument structure, the most important and puzzling fact about resultatives is that the direct object often comes to be interpreted as a *shared* argument of both predicates in ways that defy easy generalization. I will now discuss these facts in turn with a focus on the facts in German in particular.

As A. Williams (2015) convincingly argues, adverbs in resultatives modify the complex event of change, and crucially cannot modify the means event separately. To see this, consider the following example from Williams, and its German equivalent.

- (98) a. Al very rapidly pounded_M the cutlet flat_R
b. Al hat das Schnitzel ganz schnell platt_R geklopft_M
Al has the.ACC cutlet very rapidly flat hammered.PTCP

This kind of example is interpreted to mean that the *pounding flat* occurred rapidly, in a way that does not entail that the pounding itself was rapid.

- (99) a. Al very rapidly pounded the cutlet flat.
 b. \nexists Al very rapidly pounded the cutlet

For this reason, attempting to modify the M event separately from the process/change event is impossible, i.e. (100a) cannot express (100b).

- (100) a. #Al very rapidly pounded the cutlet flat quite slowly
 b. Al quite slowly flattened the cutlet by pounding it very rapidly

The same holds in German:

- (101) a. #Al hat das Schnitzel ziemlich langsam ganz schnell platt geklopft
 Al has the.ACC cutlet pretty slowly very rapidly flat pounded.PTCP
 'Al very rapidly pounded the cutlet flat quite slowly'
 b. Al hat das Schnitzel ziemlich langsam geplättet indem er es ganz schnell
 Al has the.ACC cutlet pretty slowly flattened by he it very rapidly
 geklopft hat
 pounded.PTCP has
 'Al quite slowly flattened the cutlet by pounding it very rapidly'

The fact that the events cannot be independently modified crucially necessitates that the events must be tightly linked in a way that corresponds to lexical accomplishment verbs (and not, say, syntactic causatives, see also Rappaport Hovav and Levin 2001; Beavers 2012 on this general issue in the study of resultatives).

- (102) a. #Al slowly flattened the cutlet quickly
 b. Al did something quickly that caused the cutlet to slowly become flat

A. Williams (2015) proposes that this follows under a semantics for the complex predicate MR that em-

phasizes the existence of an event of change e_1 (which he also refers to as the *process* event), with the M and R predicate serving as specifications of the means and end state of that change, respectively.³⁰

$$(103) \quad MR \cong \dots \lambda e_1 \exists e_2 \exists s [K(e_1, e_2, s) \\ \& \llbracket M \rrbracket (\dots)(e_2) \& \llbracket R \rrbracket (\dots)(s) \dots]$$

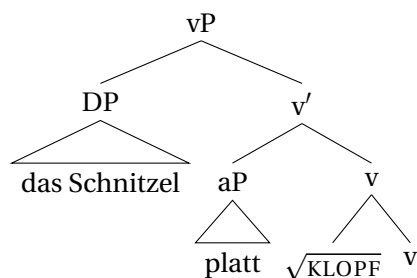
The function of K is to relate the process e_1 to its Means e_2 and End s .³¹

$$(104) \quad K(e_1, e_2, s) \equiv \text{Means}(e_1, e_2) \& \text{End}(e_1, s)$$

An important aspect of this semantics is that it does not posit a relationship of *causation* between the events. According to Williams, this correctly captures the intuition that the means event e_2 can be concurrent with the change e_1 , rather than causing (and thus preceding) it.

Syntactically, I take the tight link between the events in resultatives as analyzed above, and the impossibility of separately modifying M in particular, to demand an analysis that combines M and R in a close structural configuration. Importantly, M should not have a phrasal projection to the exclusion of R, to capture the adverb modification facts syntactically (also see A. Williams 2015 on this point). A version of the complex predicate analysis meets this mark, since the verb takes the resultative XP as its complement.

(105)



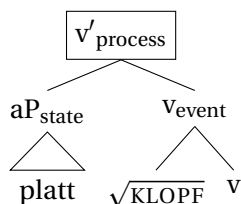
Under this analysis, there is no phrasal projection of the verb to the exclusion of the RSP. The interpre-

³⁰Here and throughout, I replace Williams' e_3 with s – this is a notational change only.

³¹See A. Williams (2015) for discussion of the reason to subsume these relations as K, the difference is not crucial for our purposes.

tation of the resultative must apply at the level of the complex predicate. In this, I build on an idea from Schäfer (2012), who proposes in a discussion of oblique causers in German (i.e., causers in the absence of Voice)³² that a specific structural configuration licenses a causative interpretation, namely one in which an event is local to a state (also cf. von Stechow 1995; Wood 2015; Wood and Marantz 2017; Creemers 2018; Biggs 2021). This, of course, is exactly the configuration of the complex predicate above.

(106)



Instead of deriving a causative interpretation in the narrow sense in this configuration as proposed by Schäfer, I follow A. Williams (2015) in adopting the complex change semantics of resultatives.³³

The interpretation of the boxed node then is as follows:

(107) $\llbracket v' \rrbracket = \lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{pound}(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{flat}(s)$

In the next step, the direct object (here, the cutlet) is crucially interpreted as the Theme of the complex event e_1 , i.e. not just as the Theme of pounding, or the Theme/state-holder of flatness, but as the Theme of a pounding-flat. Of course, we do also want to say that it is the cutlet that ends up flat as the result of undergoing the change. This, according to Williams, is accomplished by the End Theme Postulate in (108), following proposals by Pietroski (2005) and Parsons (1990).

(108) End Theme Postulate

$\text{End}((e_1, s) \ \& \ \text{Theme}(e_1, x)) \models \text{Theme}(s, x)$

³²Narrowly, the proposal is about examples as in (i), but Schäfer also suggests that this may be a more general mechanism.

(i) Mir ist versehentlich der Kaffee kalt geworden
me.DAT is unintentionally the coffee cold became
'The coffee got cold due to something I did unintentionally'

³³In spirit if not in terminology, this also seems very close to what Schäfer (2012) is arguing for.

The End Theme Postulate holds that the Theme of a change event which ends in a state must also be the Theme of that state. Thus, the cutlet has to end up in a flat state at the end of the pounding-flat event.

To evaluate this proposal, and to see why the complex predicate analysis is to be preferred over the SC analysis, we now have to consider the argument-structural properties of resultatives in a little more detail. The discussion in the previous literature has often centered on the appropriate resolution of a tension illustrated by the following examples in English:

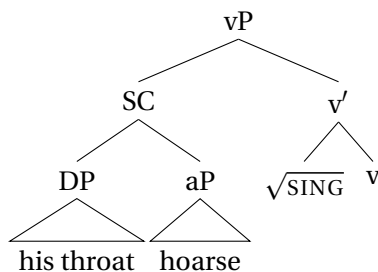
- (109) a. Al sang his throat hoarse
 b. Al pounded the cutlet flat

The first example features an argument XP that is not ‘selected’ by the M predicate, in that the M predicate on its own is an unergative verb. In the second example, on the other hand, the R predicate applies to an argument that *is* independently selected by the M predicate, which is a transitive verb.

- (110) a. *Al sang his throat
 b. *Al pounded

Following Wechsler (1997), these two types are sometimes referred to as Control and ECM resultatives, respectively. The tension is as follows: On the one hand, (109a) would seem to imply an analysis according to which the R predicate can manipulate the argument structure of the resultative by introducing or licensing an argument that is not otherwise found with the M predicate. This fact is sometimes taken to support a small clause analysis, in which the R predicate itself introduces the argument.

(111)



On the other hand, (109b) shows that the RSP is frequently predicated of an argument that is already selected by the M predicate. In the light of such examples, the SC analysis is much less attractive, as it cannot capture any thematic relation between the M predicate and the direct object (cf. Carrier and Randall 1992; A. Williams 2015; Creemers 2020 for discussion of this point, and Beavers 2012 for a more extensive summary of this tension and solutions that have been proposed). In reaction to this tension, it has sometimes been proposed that the examples with ‘selected’ and ‘unselected’ direct objects are fundamentally different either semantically or syntactically (see e.g. Wechsler 1997; Carrier and Randall 1992). This move, however, leads to a new tension: On such a differentiated analysis, it becomes mysterious that both putative types of resultatives obey the Direct Object Restriction (DOR), which holds that the resultative must be predicated of an underlying direct object. The DOR was named by Levin and Rappaport Hovav (1995), but goes back to Simpson (1983), who attributes the impossibility of a resultative interpretation in examples as in (112) to this principle.

- (112) a. I ate the food sick
 b. I danced tired

Of course, such examples are grammatical, but they only have a depictive interpretation, showing that depictives, but not resultatives, can be oriented towards the subject of transitive and unergative verbs (also cf. Winkler 1997; Rothstein 2004). The DOR is generally taken to be a core property of resultatives, and holds in German as it does in English (though not universally, as was already pointed out by Simpson).³⁴

The DOR initially appears to strengthen the case for the SC analysis, because the SC analysis encodes the relationship between the R predicate and the object directly. On this logic, the reason that R predicates can only apply to the direct object is that this is the underlying predication relationship in the small clause. Note, however, that there are several qualifications to be made regarding this argument. First, as was already noted by Carrier and Randall (1992), this argument only goes through if an SC resultative

³⁴The empirical validity of the DOR has been called into question, cf. Wechsler 1997, 2005; Rappaport Hovav and Levin 2001; I will assume here that putative counterexamples speak to the correct delimitation of the phenomenon, see the discussion of directional PPs above, and cf. Mateu 2005; A. Williams 2015.

with a PRO subject can be independently ruled out.

(113) *Al sang [_{SC} PRO hoarse]

Secondly, and more decisively, it should be apparent that the SC analysis merely shifts the burden of argument-structural complexity onto the M predicate. If the SC is an argument of the verb, it must be selected by the M predicate, in direct conflict with the assumption that the M predicate is intransitive and does not select an argument. If, on the other hand, the SC is an adjunct to the verb, the opposite problem obtains: it becomes mysterious why the M predicate cannot introduce its own direct argument independently of the SC.

(114) *Al sang the song [_{SC} his throat hoarse]

As I hope this brief overview has demonstrated, the SC analysis has initial appeal for English, but is poorly equipped to handle the relationship between the M predicate and the direct object in a fundamental way. These issues do not arise in a complex predicate analysis, because, as mentioned above, the direct object is taken to be an argument of the complex event, regardless of the transitivity of M.

Importantly for our purposes, it has been claimed that German is different from English in allowing *only* unergative M predicates in resultatives, building on the observation that German has fewer obligatorily transitive verbs than English.³⁵ If this were the case, it could be taken to resurrect the case for an SC analysis, or another type of analysis that takes the object to always be introduced by the R predicate (see e.g. Kratzer 2005). However, as Rapp 1997; Creemers 2020 point out, there are clear examples of obligatorily transitive, unaccusative, and inherently reflexive verbs occurring as M predicates in the language ((115a-b, e-f) are from Creemers, (115c-d) are adapted from Rapp).

(115) M can be non-unergative

- a. Hans hat den Stock kaputt_R gebrochen_M
 Hans has the.ACC stick broken broken.PTCP

³⁵As we will see in the next section, this is connected to the fact that most obligatorily transitive verbs in German are prefixed.

	'Hans broke the stick'	obligatorily transitive
b.	Hans hat den Stock krumm _R gebogen _M Hans has the.ACC stick crooked bent.PTCP 'Hans bent the stick completely crooked'	obligatorily transitive
c.	Hans hat seine Haare glatt _R gekämmt _M Hans has his.ACC hair straight combed.PTCP 'Hans combed his hair straight'	obligatorily transitive
d.	Hans hat sein Kaninchen schläfrig _R gestreichelt _M Hans has his.ACC rabbit sleepy stroked.PTCP 'Hans stroked his rabbit to sleep'	obligatorily transitive
e.	Das Wasser fror _M fest _R the.NOM water froze solid 'The water froze solid'	unaccusative
f.	Sie haben sich krank _R /tot _R geschämt _M they have REFL sick/dead shamed.PTCP 'They were embarrassed sick/dead'	inherently reflexive

In reaction to examples such as (115a,c,e), it has sometimes been argued that these are *weak resultatives* in the terminology of Washio (1997), in which the R predicate merely specifies a result state already encoded in the M predicate (also cf. Rappaport Hovav and Levin 2001), and thus should receive an adverbial analysis rather than count as true resultatives (Kratzer 2005). While I agree that there is evidence that some weak resultatives require a separate treatment (see section 4.5.2), this argument clearly does not apply to examples like (115d). Even in cases like (115a), where the M predicate *brechen* 'break' would appear to encode a result state, the picture is more complicated than the adverbial analysis would suggest, in that an additional R predicate is in fact obligatory on most uses of *brechen* in German.³⁶

- (116) a. *Hans brach
Hans broke

³⁶Though cf. (i):

- (i) Hans brach sein Versprechen
Hans broke his promise
'Hans broke his promise'

- b. ??Hans brach den Stock
 Hans broke the.ACC stick
 'Hans broke the stick'
- c. Hans brach den Stock kaputt
 Hans broke the.ACC stick broken
 'Hans broke the stick'

Crucially, these examples are not problematic on the complex predicate analysis in combination with the process semantics for resultatives that I adopted above: On this analysis, the direct object is the Theme of the complex event. The relationship of the argument to the R predicate is pre-determined by this event structure given the End Theme Postulate (108), while its relationship to the M predicate depends on the verb, giving rise to the impression that the Theme is a 'shared' argument of both predicates if the verb takes a Theme. In the case at hand, German encodes the relevant notion of breaking as a syntactically complex verb, *kaputt brechen*. The stick is the Theme of the change event denoted by that verb, and is interpreted as broken due to the End Theme Postulate.

In sum, I have argued that in spite of initial appearances, German resultatives do not lend themselves to an SC analysis any more than their English counterparts. Instead, a syntactic complex predicate analysis allows us to account for the event- and argument-structural complexities that resultatives display if we adopt a semantic analysis that emphasized the relationship of the arguments to the complex event. As we will see below, this kind of semantic analysis is also helpful in understanding the relationship between resultatives and prefixed verbs.

4.3 PREFIXES AND PARTICLES: SYNTAX AND INTERPRETATION

In this section, we will look in some detail at the structural and interpretative properties that are important with respect to prefixed and particle verbs in German. The literature on this topic is vast, and encompasses many different grammatical frameworks and perspectives. As such, this overview necessarily leaves out some important references and represent others in a way that is somewhat different from what the authors intended. It is also important to note that while this overview necessarily fo-

cuses on German, particles in particular have also been studied in works that are of interest to us here but that pertain to other languages, especially Dutch and English. Discussing claims from those works in the present context requires caution: German particles do not behave syntactically exactly the same as their English or Dutch counterparts. For example, English *particle shift* and Dutch *verb raising* both have properties that are pertinent to our discussion, insofar as they have been argued to speak to the phrase/head distinction for particles and their syntactic position, but both processes are optional (modulo specific restrictions), whereas German particles are obligatorily stranded when the verb moves. If we take this to be a core property of German particles (as I argue we should), it precludes several analytical paths that might be available for English or Dutch. Similar issues apply to any attempt of connecting the argument-structural properties of particles in these languages. For this reason, I will leave a cross-Germanic and cross-linguistic investigation of PPR verbs to future work – at present, I am skeptical of analyses that purport to work for all of Germanic or beyond. See e.g. McIntyre (2015) and Toivonen (2020) for recent overviews of the issues in Germanic.

4.3.1 SYNTAX

In this section, I discuss the syntactic properties of prefixed and particle verbs in German. I begin by demonstrating that an analysis that captures the core insight in Wurmbrand (1998) and Zeller (2001a), which is that prefixes are represented as heads in the syntax, while particles are phrasal, is necessary to capture the core syntactic fact about prefixed and particle verbs in German, namely that prefixes are inseparable, while particles are separable³⁷ by verb movement and inflectional and derivational morphology.³⁸ (117) repeats the examples from the introduction, and shows that neither behavior is optional.

- (117) a. Jonas **ent-nimmt**₁ seinem Portemonnaie einen Schein ___₁
 Jonas ENT-takes his.DAT wallet a.ACC bill
 ‘Jonas is taking a bill out of his wallet’

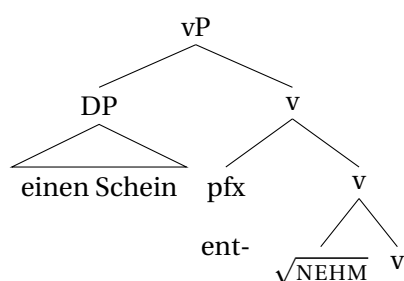
³⁷As I have stressed above, particles *must* be separated under V2 in German, the term ‘separable’ should not be taken to imply optionality in this context.

³⁸Arguably, as we will see below, this list should also include movement of the particle itself.

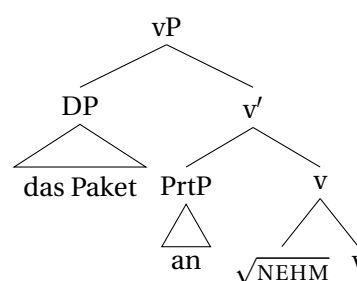
- b. *Jonas nimmt seinem Portemonnaie einen Schein ent-
Jonas takes his wallet a bill ENT
- c. Mein Nachbar **nimmt**₁ das Paket **an**-₁
my neighbor takes the.ACC package AN
'My neighbor will accept the package.'
- d. *Mein Nachbar an-nimmt das Paket
my neighbor AN-takes the package

I will argue, again broadly in agreement with Wurmbrand and Zeller, that the structures for prefixes and particle verbs respectively are as follows:

(118) Inseparable prefixes



(119) Separable particles



In addition to separability, this analysis makes it easy to derive the fact that prefixes are unstressed, while particles receive main stress, and correctly (though controversially) predicts that particles can undergo phrasal movement (in addition to being stranded by head movement). Following this discussion of the structural basics, the remainder of this subsection is concerned with the argument-structural properties of prefixes and particles, and how these properties have been argued to pertain to their syntactic representation and category. As we saw in the introduction of this chapter, both types of preverbal elements can contribute to the argument structure of the complex verb phrase in various ways. This discussion will also serve as a transition to broader points about the interpretative properties of prefix and particle verbs in section 4.3.2.

The class of inseparable prefixes is typically considered to be a closed class, containing the elements in the leftmost column of the following table.

³⁹This is not participial *ge-*, but a separate, relatively rare prefix found in verbs such as *ge-bären* (give birth), *ge-denken*

prefix	as free morpheme	particle
be- ent- er- ge- ³⁹ miss- ver- zer-		
durch- hinter- über- um- unter- wider-	through _P behind over around under against	durch- hinter- über- um- under- wider-
	down/off on up out at in off after before/in front of to/at/for piano _N bike _N easy _A	ab- an- auf- aus- bei- ein- los- nach- vor- zu- klavier- rad- leicht- ...

Table 4: Prefixes and Particles.

The second column of the table shows whether the prefix also occurs as a freestanding preposition, and, in that case, a rough translation of the meaning of that preposition. It is important to stress again that this meaning will not always be transparently inherited by the complex verb, and the table also should not be taken to imply that prefixes that do not occur as full prepositions have no interpretation at all. The columns to the right of the table show that particles distinguish themselves by the fact that all of them also occur as free morphemes in other contexts.⁴⁰

There is some debate in the literature concerning the extent to which nominal and adjectival particles should be investigated alongside prepositional particles (cf. Stiebels and Wunderlich 1994; Lüdeling 2001; Zeller 2001a; Müller 2002; McIntyre 2015), as a tendency, they are excluded by studies that focus on the syntactic or categorial status of the particle, but included in studies that focus on the morphology of complex predicates in German. I include them in the table for the sake of completeness, but none of the arguments below crucially depend on their classification.

The middle of the table shows that some elements can appear as prefixes *and* particles. This is the case even when in the context of the same verbal Root; two examples of minimal pairs are given in (120).

- (120) a. Frederik um-fuhr das Verkehrsschild
 Frederik UM_{prfx}-drove the.ACC traffic.sign
 'Frederik drove around the traffic sign'
- b. Frederik fuhr das Verkehrsschild um
 Frederik drove the.ACC traffic.sign UM_{pRT}
 'Frederik knocked over the traffic sign'
- c. Tanja durch-fuhr den Park
 Tanja DURCH_{prfx}-drove the.ACC park
 'Tanja drove through the park (traversing it completely)'
- d. Tanja fuhr durch
 Tanja drove DURCH_{pRT}
 'Tanja drove through'

(commemorate), *ge-fallen* (like).

⁴⁰Note that in some sense, the mere fact that particles can be stranded means that they can occur 'by themselves' as it were, but this is not the intended definition of a free morpheme here: Rather, the fact is that all particles are identical in form and closely related in meaning to elements which appear in grammatical contexts that have nothing to do with complex verb formation, i.e. as prepositions, nouns, or adjectives.

In such cases, there is a difference in stress assignment between the otherwise homophonous complex verbs, tracking the stress pattern on prefixed and particle verbs more generally: In prefixed verbs, main stress falls on the verbal Root, whereas in particle verbs, it falls on the particle.

- (121) a. *umfáhren* ‘drive around’
 b. *úmfahren* ‘drive over, knock over by driving’

Although particles tend to be phonologically heavier than prefixes, the examples above demonstrate that this contrast holds regardless of the phonological properties of a specific prefix or particle. As Wurmbrand (1998) has argued, the difference in stress assignment is predicted if we analyze prefixes as heads that form a complex head with the verb, while particles are phrasal and form a prosodic word (the overall stress pattern of particle+verb is the pattern of compound stress in German).

In addition to the prosodic difference, (120) also highlights again that prefixed and particle verbs have diverse argument-structural properties, which are discussed in more detail below.

Before turning to the argument structure of prefix and particle verbs, note that the analysis above makes certain predictions about the constituency of particle verbs in particular. Phrasal analyses of the particle predict that the particle may undergo phrasal movement (in addition to being left behind by head movement). Indeed, certain particles can be topicalized, especially if they are relatively transparent in meaning, and in particular have the ability to contrast with an alternative (cf. Wurmbrand 2000; Lüdeling 2001; McIntyre 2002; Müller 2002; Zeller 2001a, 2002; Trotzke et al. 2015; Trotzke and Quaglia 2016). This applies especially to directional prepositional particles, as well as nominal and adjectival particles, and is further improved if the verb immediately follows the particle (having moved to C, thus the improvement from (121c) to (121d)).⁴¹

- (122) a. *Auf geht die Sonne im Osten*
 AUF goes the.NOM sun in.the east
 ‘The sun rises in the east’

⁴¹It is worth noting that there is variability in these judgments. See Trotzke et al. (2015) for an acceptability study.

- b. Runter hat sein Chef ihn gemacht
 RUNTER has his.NOM boss him.ACC made.PTCP
 'His boss dressed him down'
- c. ?Ab ist Nixon in 1974 getreten
 AB is Nixon.NOM in 1974 kicked.PTCP
 'Nixon resigned in 1974'
- d. Ab trat Nixon in 1974
 AB kicked Nixon.NOM in 1974
 'Nixon resigned in 1974'
- e. Bus würde er gerne fahren
 BUS would he.NOM gladly ride
 'He would gladly ride the bus'
- f. Leicht ist es ihm nicht gefallen
 LEICHT is it him.DAT not fallen.PTCP
 'It didn't come easy to him'

Zeller (2002) notes a potential concern in this respect: Sentences like (122a) are information-structurally marked in a way that seems to go beyond the requirements for the topicalization of full PPs, and (prepositional) particles seem to scramble less freely than full PPs.

- (123) a. weil auf diesen Wagen noch nichts geladen wurde
 because on.to this.ACC cart yet nothing loaded was
 'because nothing had been loaded onto this cart yet'
- b. ?weil auf noch nichts geladen wurde
 because AUF yet nothing loaded was
 'because nothing had been loaded yet'⁴²

While it is intuitively unsurprising that particles are less easily interpreted under the information-structural requirements for topicalization, these contrasts require further investigation. Crucially, however, the ability of particles to undergo topicalization at all strongly supports an analysis that takes them to be syntactic phrases.⁴³

Ideally, one would like to further substantiate this conclusion with a demonstration that particles

⁴²Example from Zeller 2002, who judges it '?*'.
⁴³However, it should be acknowledged that the topicalization argument presupposes a non-VP-remnant fronting analysis of topicalization.

can also be independently modified. Zeller (2001a) cites examples as in (124) in this respect.

- (124) a. Peter hat die Tür [ganz weit auf]-gemacht
Peter has the.ACC door very wide AUF-made.PTCP
- b. [Ganz weit auf] hat Peter die Tür gemacht
very wide AUF has Peter.NOM the.ACC door made.PTCP
'Peter opened the door very widely'
- c. [Besser aus] sieht das Kleid da hinten
better AUS looks the.NOM dress there back
'The dress back there looks better'

In examples such as these, it is argued that the modifier 'very widely' applies to the 'open' state encoded in the particle, rather than to the whole verb. (125b) shows that this is possible even under topicalization, when the particle has moved away from the verb (in fact, modification *improves* particle topicalization, presumably because it enhances the particle phrase's ability to contrast, cf. Zeller 2001a). While the data with topicalized *and* modified particles are indeed suggestive of the possibility of a modifier syntactically attaching to the particle to the exclusion of the verb, it is worth pointing out that the non-topicalized example in (124a) is subject to an independently debated question in the literature, concerning the extent to which the semantic modification of a state in a complex event requires a separate structural attachment site for such modifiers (cf. von Stechow 1996). This issue is highlighted by (125c), where the modifier must in fact semantically apply to the entire particle verb, even when the particle is topicalized.

Importantly, topicalization of *prefixes* is completely impossible, as is expected if they are syntactically distinct from particles in head-adjointing to the verb. Examples with elements that can in principle appear as either prefixes or particles are especially telling in this regard. Recall from above that *um-fahren* means 'drive around' in prefix-verb syntax, but 'knock over' in particle syntax. Only the second meaning is accessible in the topicalization context.

- (125) Um fuhr Frederik das Verkehrsschild
UM_{PRT/*pfx} drove Frederik.NOM the.ACC traffic.sign
'Frederik knocked over the traffic sign'

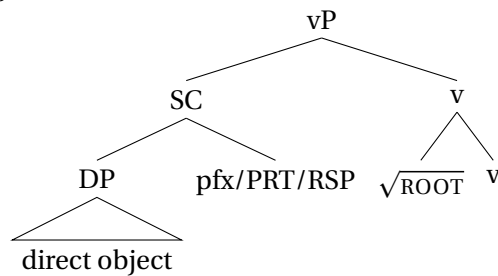
NOT 'Frederik drove around the traffic sign'

In some sense, of course, this contrast is not unexpected, and perhaps for that reason has not been remarked upon in the previous literature, to the best of my knowledge. From the perspective of substantiating the claim that prefixes and particles must be distinguished syntactically, however, the seemingly trivial fact that prefixes cannot be topicalized is quite telling. In particular, as mentioned above, the previous literature on particle topicalization has debated to what extent *transparency* is a condition for the topicalization of a particle. In the case of *um-fahren*, the prefix verb is more transparent than the particle verb. This means that whatever the correct characterization of the semantic and information-structural requirements on topicalization may be, they must be secondary to a syntactic difference between prefixes and particles: Only particles are potential candidates for topicalization, prefixes are not.

To summarize, while there is no analysis of German prefix and particle verbs that does not raise more questions than it answers, one basic distinction, whereby prefixes form part of a complex head with the verb, while particles are phrasal complements to the verb, is strongly supported by the behavior of these elements under head- and phrasal movement, respectively. Note that, even before we bring argument structure into consideration, this basic conclusion is bad news for purely syntactic accounts of the co-occurrence restrictions detailed in section 4.1. Recall that these accounts rely crucially on a templatic effect, whereby preverbal elements compete for the same structural position (typically, the head of a small clause). The initial considerations in this section already rule out the possibility that this analysis will cover the whole paradigm in German, because prefixes and particles were shown to be crucially structurally distinct (and therefore cannot be competing for the same structural position, regardless of the specifics of such an analysis). Recall next that the syntactic approaches typically also relate the templatic analysis to argument introduction: Using again the SC analysis to illustrate, SC analyses of prefixes, particles, and resultatives crucially assume that the preverbal element itself introduces the direct object in such constructions (inside the SC, recall the discussion above of e.g. Hoekstra 1988; den Dikken 1995; Koopman 2010), the object is thus considered an argument of the preverbal element.⁴⁴

⁴⁴Different SC analyses in the literature differ with respect to the internal structure of the SC, and in particular whether the argument is argued to be the subject of the SC or a complement to the preverbal element. The criticism in this chapter applies

(126) SC analysis



Over the next two subsections, I argue for an alternative view, according to which prefixes and some (but not all) particles contribute *end states* to complex predicates, thereby forming complex change-of-state events. The internal argument is subsequently interpreted as the change-of-state Theme, similarly to what we saw in the discussion of resultatives. This analysis preserves the intuition that the prefix or particle is involved in introducing the Theme, without appealing to a constituent that contains the prefix and ‘its’ argument to the exclusion of the verb. Related proposals were made in the lexicalist tradition in the 80s and 90s (see in particular Kaufmann 1995; Stiebels 1996; Wunderlich 1997). The empirical coverage and depth of semantic analysis achieved by these authors far exceeds that of any subsequent syntactic analysis, including the one presented here. My goal is not to recast their comprehensive treatments in terms of small syntactic structures and allosemy, but rather to sketch the properties of a syntactic analysis that can do the event- and argument-structural complexities of these verbs justice.

Concerning prefixed verbs, I argue that the event structure-centric view gives a better explanation of the complex ways in which the argument structure of the simplex base verb is affected by prefixation, especially in two cases that are highly problematic for the SC analysis and related proposals: cases in which the base verb is already transitive, and cases in which the ‘base’ verb does not exist. Concerning particles, I argue that the comparatively wider range of argument-structural effects of particles also makes the SC analysis implausible, though for a different reason. The SC analysis predicts a consistent relationship between the particle and ‘its’ argument, which is not what we find.

to either version, as it primarily targets constituency and the relationship of the argument and preverbal element to the verb.

4.3.1.1 Prefixes, category, and argument structure

At the core of any investigation of prefixed verbs in German sits the observation that these verbs display a high degree of idiosyncrasy in interpretation, but also many regularities and subregularities in argument and event structure. This leads to a tension: From the first perspective, it looks like prefix verbs cannot be syntactically and semantically decomposed, from the second perspective, it looks like they must be. One way to approach this tension is by asking whether prefixes are syntactically acting as belonging to an argument-introducing category, such as P or V, even if they end up with non-transparent interpretations at least some of the time. In this vein, it has frequently been argued in the literature that prefixes are in fact of category P (cf. Wunderlich 1987; Gehrke 2008 a.o.). This view is supported by the fact that prefixes such as *über-*, *durch-*, *um-* have the same form as the prepositions *über* (over), *durch* (through), *um* (around) and so on. The remaining prefixes such as *be-*, *ent-*, *er-*, *zer-* etc. do not correspond to prepositions in modern German, but historically derive from prepositions, and have been argued to manipulate the argument structure of the verb in a way that connects to prepositions. For examples, Wunderlich (1987) argues that *be*-prefixed verbs systematically introduce an argument that has to be introduced in a PP to occur with the simplex verb.

- (127)
- a. Sie läd Heu auf den Wagen
she loads hay.ACC on.to the cart
'She loads hay onto the cart'
 - b. Sie be-läd den Wagen mit Heu
she BE-loads the.ACC cart with hay
'She loads the cart with hay'
 - c. Er malt Blumen auf den Schrank
he paints flowers.ACC on.to the cupboard
'He paints flowers onto the cupboard'
 - d. Er be-malt den Schrank mit Blumen
He BE-paints the.ACC cupboard with flowers
'He paints the cupboard with flowers'
 - e. Sie sprechen über die Konsequenzen
They speak about the consequences
'They talk about the consequences'

- f. Sie be-sprechen die Konsequenzen
They BE-speak the.ACC consequences
'They discuss the consequences'
- g. Sie arbeiten an diesem Projekt
they work on this project
'They work on this project'
- h. Sie be-arbeiten dieses Projekt
they BE-work this.ACC project
'They work on this project'

This (applicative) argument structure alternation recalls the English spray/load pattern, and (existing and conceivable) analyses are similarly varied (see e.g. Beavers 2017 for an overview of the vast analytical space for spray/load). In the present context, as was already discussed by Wunderlich (1987), it's important to note that although the argument structure that is contributed by many prefixes resembles that of prepositions, there is no one-to-one correspondence between the prepositions and prefixes that occur to introduce a particular kind of argument with any given verb. This means that analyses that derive the prefixed structure from a PP in the syntax (see e.g. Biskup and Putnam 2012, and cf. Svenonius 2003) will fail to generalize. In addition, the examples in (127) also show that the prepositional objects with the simplex verbs correspond to a range of different thematic roles, ruling out analyses that rely specifically on locational or directional interpretations of prepositions.

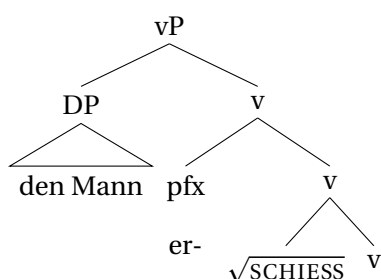
An important question in this respect is to what extent it is sensible to think of prefixes as applicative heads, or as 'transitivizing' more broadly. As the examples above show, prefixation crucially applies both to verbs that are already transitive, as in (127a-d), and to intransitive verbs, as in (127e-h). The resulting prefixed verb itself is almost always transitive, or sometimes unaccusative, cf. (128).

- (128)
- a. Die Blumen ver-blühen
the flowers VER-bloom
'The flowers are withering'
 - b. Der Mann er-trinkt
the man ER-drinks
'The man is drowning'

The generalization that emerges is that prefixed verbs typically have a Theme argument.⁴⁵ I will not address here whether this generalization needs to be syntactically encoded (see e.g. Zeller 2001b for a proposal in this vein and some of the complications that ensue), what is clear is that it must be incorporated in the semantic analysis of prefixed verbs.

I propose that prefixed verbs have the simple vP structure in (129), repeated from (118). The prefix is adjoined to the [$\sqrt{\text{ROOT}}\text{v}$] complex, the argument is merged as the complement to the complex verb.

(129) Inseparable prefixes



Crucially, the Theme interpretation is tied to the event structure of prefixed verbs, which typically denote complex changes of state (cf. Kaufmann 1995; Rapp 1997). I adopt a change-of-state semantics as proposed in A. Williams (2015), which is essentially identical to the semantics for resultatives that we saw in the previous section. On this account, in prose, ‘den Mann er-schießen’ (shoot the man dead) means ‘the man is the Theme of a change event, which is related to a means event and an end state, where the means event is a shooting and the end state is being dead’.

(130) $[[vP]] = \lambda e_1 \exists e_2 \exists s. \text{Means}(e_1, e_2) \ \& \ \text{shooting}(e_2) \ \& \ \text{Theme}(e_1, \text{the man}) \ \& \ \text{End}(e_1, s) \ \& \ \text{dead}(s)$

In applying the semantics above to the particular example of *er-schießen* (shoot dead), note that the meaning contributions of the base verb and the prefix are relatively transparent: *schießen* means ‘shoot’ and provides the predicate for the means event, and *er*-verbs sometimes denote changes that result in the demise of the Theme, cf. *er-trinken* (drown), *er-hängen* (hang), *er-würgen* (choke to death). Thus, we

⁴⁵It is worth noting that this generalization is pervasive (and highly regular compared to the argument structure of particle verbs, see next section), but not exceptionless.

might represent the semantics of a change-of-state verb more generally as in (131) (cf. Biggs and Embick [in prep](#) on this notation):

$$(131) \quad \llbracket \nu \rrbracket = \lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{Pred}_1(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{Pred}_2(s)$$

In an example like *er-schießen*, with a transparently resultative-like interpretation and a specific end state, we can then think of this as a semantic template, into which *schießen* (shoot) is inserted as Pred_1 , and *er-* (here: dead) is inserted as Pred_2 . This way of interpreting change-of-state verbs in parallel to resultatives also gives us a handle on the implementation of the semantic component to the co-occurrence restrictions detailed in 4.1. If the prefix *er-* has already provided Pred_2 , it is unsurprising that an RSP cannot do so (we will return to this in section 4.4).

Crucially, however, we have already seen in previous examples that not all end states that are associated with the prefixes are equally specific, nor can we always equate the base verb with the Means predicate, this will be discussed in more detail in section 4.3.2. The generality of the semantics above lies in the claim that vPs of the shape in (129) are interpreted as changes of state, as per the discussion in 4.2.1 (cf. Schäfer 2012). It is not the case that the Root and the prefix *must* contribute specific Means and End predicates, respectively, although they do so in the more transparent cases. This flexibility is built into the analysis on purpose: it captures the fact that while prefix verbs in German can and should be semantically decomposed, it is not possible to consistently associate a specific part of the semantic denotation to a specific part of the morpho-syntactic structure. Contra e.g. Stiebels (1996), I do not take this to mean that the event- and argument structure of prefixed verbs cannot receive a syntactic analysis, but I do take this state of affairs to require a somewhat coarse-grained association between the syntax and the semantics, thus agreeing with Stiebels that an analysis with semantically contentful syntactic representations such as BECOME and CAUSE heads will not suffice to derive the structure and interpretation of prefixed verbs.

On the view advanced here, the typical change in argument structure from simple to complex verb tracks the change in event structure: prefixes typically introduce end states to the typically activity-

denoting simplex verb, the resulting complex verb requires a Theme interpretation of its object.

Importantly for our purposes, an alternative analysis that relies on a syntactic constituent including the prefix and the Theme argument to the exclusion of the verb (such as a small clause) will run into serious issues for multiple reasons. The first reason, which we have already encountered in the previous section, is that there is syntactically no evidence of a constituent that includes the prefix and the object to the exclusion of the verb. Assuming for the moment that this problem can be circumvented by the mechanism that affixes the prefix to the verb,⁴⁶ the SC analysis still cannot explain the fact that prefixation is possible with both transitive and intransitive base verbs. Note that this holds regardless of the syntactic relationship between the verb and the SC, which is often left vague in SC analyses. If the SC is an argument of the verb, prefixation should be ruled out with base verbs that take an obligatory DP argument, contrary to fact. Conversely, if the SC is an adjunct to the verb, it should fail to block the selection of the base verb's internal argument, contrary to fact.^{47,48}

Aside from 'prefixes are P', a second view on the category of prefixes deserves at least brief mention here. It has sometimes been argued that (some) prefixes are in fact of category V (see e.g. Lieber 1980; Wurmbrand 1998). This is relevant for our purposes for two reasons. First, I briefly note that the 'prefixes are V' analysis has also been linked to the argument structure alternations that are found with prefixation (see in particular Wurmbrand 1998, and also cf. Zeller 2001b). The basic idea is that prefixes contribute to a VP shell structure, thereby introducing additional arguments. This analysis is plausible enough for e.g. some *be*-prefixed verbs that take the shape of canonical applicatives (recall (127)), but, as I have noted above, it faces the issue that the argument structure of prefixed verbs is far more uniform than the argument structures associated with the verbs that form the *input* to such prefixation. On its own, a VP-shell analysis can therefore predict neither the availability of particular prefixed verbs, nor whether the arguments associated with the base verb on its own will surface with the prefixed verb.

My second reason for mentioning the 'prefixes are V' analysis is that some of the data that most

⁴⁶As the comparison with particles makes clear, this is in fact not an easy task.

⁴⁷The SC-as-adjunct option faces additional issues, such as potentially predicting that the argument cannot be extracted, contrary to fact.

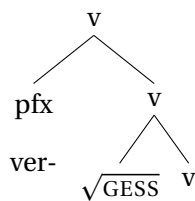
⁴⁸Note that these syntactic issues are essentially the same as plague an SC analysis of resultatives, which I discussed in section 4.2.1 – the issues are even more pervasive in the domain of prefixation.

strongly motivate it pose another serious issue to the small clause analysis and other analyses that rely on the base verb combining with a larger syntactic constituent. To see this, consider the following examples of prefixed verbs that are not derived from any existing base verb (examples from Zeller 2001b):⁴⁹

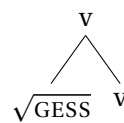
- (132) a. ver-gessen, ‘forget’, *gessen
 b. ver-letzen, ‘hurt’, *letzen
 c. be-ginnen, ‘start’, *ginnen
 d. ver-langsamem ‘slow down’, *langsamem_V, but cf. langsam_A ‘slow’
 e. er-mutigen ‘encourage’, *mutigen_V, but cf. mut-ig_A ‘courageous’, Mut_N ‘courage’

In the examples in (132a-c), the verb Root in the complex verb occurs in no other context but in prefixed verbs, in (132d-e), the prefixed verbs are denominal or deadjectival, in the sense that they embed an existing noun or adjective, but those adjectives and nouns do not form simplex verbs. Under the ‘prefix-as-V’ view, these verbs are left-headed and verbalized by the prefix (thus form exceptions to the Righthand Head Rule, Lieber 1980; E. Williams 1981). The alternative, which I adopt here, holds that such verbs involve regular (re-)categorization by *v*, contingent on the presence of a prefix.

(133) ver-gessen ‘to forget’



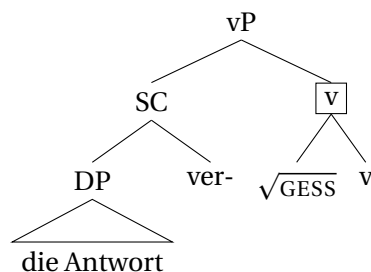
(134) *gessen



Crucially, this contingent relationship involves an element within the same complex head. Thus, while these facts are somewhat challenging on any account, introducing costs such as left-headedness or contingent categorization, I take them to be especially costly for the small-clause approach, where it would have to be claimed that a non-existing verb can be forced to syntactically select a small clause.

⁴⁹Zeller also gives *be-gnügen*, ‘be content with’, **gnügen* as an example in this category, but I take *gnügen*, which indeed does not occur by itself, to be the disyllabic form of the verb *genügen*, meaning ‘suffice’, to which *be-gnügen* is transparently related.

(135) (die Antwort) ver-gessen ‘forget (the answer)’



In order for this derivation to succeed, the non-existent verb must be rescued by material from within the small clause by selecting the small clause at the boxed node, creating a non-local contingency.

To summarize, I have claimed that prefixed verbs typically denote a complex change of state, closely resembling the meaning of a resultative construction, whether they are syntactically transitive or unaccusative. I have argued that this is more appropriately captured by an account that assigns a change-of-state semantics to prefixed verb structures than by alternatives that introduce the Theme directly as an argument of the prefix itself. The advantages of the present approach are primarily in its ability to cope with the idiosyncrasies of whether a given prefixed verb exists and what meaning is assigned to it (cf. section 4.3.2), as well as in avoiding false predictions concerning the linking of arguments present with the corresponding unprefixed verb.

4.3.1.2 Particles, category, and argument structure

As we saw in the previous section, the event- and argument-structural effect of prefixation is highly uniform, I argued that this is because prefixes introduce end states into a change-of-state denotation for the complex verb. In this section, I will show that the behavior of particles is much less uniform. Given the fact that particles are identical in form to prepositions (setting nominal and adjectival particles aside), this may initially be surprising. In fact, because it is plausible that most particles in German are (intransitive, complement-less) prepositions (cf. e.g. McIntyre 2007), some researchers have argued that particle verbs are derivationally related to verbs with full PP complements (Svenonius 2003; Biskup and Putnam 2012), I will refer to this as the ‘PP-to-PRT analysis’. These authors build their argument around examples as in (136), in which the sole argument of a particle verb in (136b) corresponds to a PP argument found

with the simplex verb in (136a) (here, with a ground/source interpretation):

- (136) a. Der Fischer nimmt die Innereien aus dem Fisch
 the fisherman takes the.PL.ACC offal out of.the fish
 ‘The fisherman takes the offal out of the fish’
- b. Der Fischer nimmt den Fisch aus
 the fisherman takes the.ACC fish AUS
 ‘The fisherman guts the fish’

On the PP-to-PRT analysis, (136b) is derived from (136a) at some level of abstraction: the preposition becomes the particle, and its argument is promoted to the direct object position. While this analysis is appealing in potentially providing a straightforward explanation for the isomorphism between particles and prepositions, and the interpretation of particle verb arguments, it faces two significant challenges that lead me to reject it. The smaller of these challenges is that it potentially predicts constituency effects for the particle and the argument. This prediction is shared (even more straightforwardly) by the small clause analysis of particle verbs, and is incorrect, as I demonstrate at the end of this section.

The more immediate challenge, however, is that the pattern in (136) is only one of many patterns in the argument structure of particle verbs in German. We have already seen that many particle verbs allow intransitive uses:

- (137) a. Tanja fuhr durch
 Tanja drove DURCH
 ‘Tanja drove through’
- b. Nixon trat ab
 Nixon kicked AB
 ‘Nixon resigned’

Other particle verbs introduce an argument that corresponds to the figure argument, rather than a ground argument, of the preposition (as is the prevalent pattern in English particle verbs):

- (138) a. Ich schneide das Schild ab
 I cut the.ACC tag AB

'I cut the tag off'

- b. Du packst die Kekse ein
 you pack the.ACC cookies EIN
 'You wrap up the cookies'

Yet other particle verbs introduce arguments that cannot be expressed as PP arguments with the base verb at all (cf. Stiebels 1996; Zeller 2001a).

- (139) a. *Daniel arbeitet ab/an/auf seinen Schulden
 Daniel works off/at/on his debt
 intended: 'Daniel works to affect/reduce his debt'
- b. Daniel arbeitet seine Schulden ab
 Daniel works his.ACC debt AB
 'Daniel works off his debt'

This type of particle verb (which is not at all uncommon or otherwise remarkable) clearly requires that the particle can affect the argument structure of the verb in a way that goes beyond a more or less transparent alternation. Even if it could be stipulated (in the context of a PP-to-PRT analysis or similar) that some prepositions *must* occur in the particle syntax, this would not only deprive the analysis of its main prediction, but would more importantly necessitate a mechanism by which particle verbs can be interpreted and introduce arguments independently of the properties of a (non-existent) [V PP] source.

A related challenge to a derivational relationship between a full PP and particle verbs comes from so-called pseudo-reversative particle verbs (cf. Stiebels 1996; McIntyre 2002), many of which cannot be paraphrased with a PP in spite of featuring a directional particle.

- (140) a. Sie parkte (das Auto) aus
 she parked (the.ACC car) AUS
 'She pulled out of the parking space'
- b. *Sie parkte (das Auto) aus der Parklücke
 she parked (the.ACC car) out the parking.space
 intended: 'She removed the car from the parking space'

I take these cases to be particularly damning for the 'PP-to-PRT analysis', as a directional particle in a

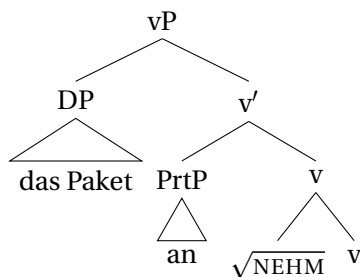
transparently directional use should provide the conditions that are most amenable to such an analysis. Instead, they highlight that particle verbs behave as complex predicates in the sense of imposing their interpretative and argument-structural requirements in ways that cannot be reduced to a PP, even in cases where they are interpreted completely transparently.

To mention one last class of particle verbs, there are also cases in which particles not only fail to introduce an additional argument, but in fact appear to block an argument that is possible with the base verb (McIntyre 2001 gives these as completely ungrammatical, in my judgment, including the object is marked, but not impossible).

- (141) Sie hat (??ein Lied) los-gesungen
 she has a.ACC song LOS-sung.PTCP
 ‘She started singing (a song)’

To summarize, the argument-structural effects of particles in German defy easy generalization, and in particular are not plausibly captured by positing an underlying PP constituent that contains the particle and its argument. Of course, the complications detailed here do not in principle rule out this analysis for a subset of particle verbs. However, a unified syntax of particle verbs along the lines sketched in the introduction to this section is also possible, and to be preferred in the absence of clear evidence for non-uniform structures for particle verbs.

- (142) Separable particles



As we have seen above in (122), certain particles may undergo topicalization. Given the ‘PP-to-PRT analysis’, or a small clause analysis of at least some particle verbs (cf. Grewendorf 1990; Wurmbrand 2000) the

question arises whether this putative constituent can also undergo topicalization. While Wurmbrand and Grewendorf claim that this is possible based primarily on the data point in (143a), I find most such examples marginal (note similar comments in Zeller 2001a; Müller 2002), and many others are clearly ungrammatical, including ‘transparent’ particle verbs, for which the analysis is intended by Grewendorf and Wurmbrand.

- (143) a. ?Die Tür zu hat er gemacht
 the.ACC door ZU has he.NOM made.PTCP
 ‘He closed the door’
- b. ??Den Stuhl empor hat er gehoben
 the.ACC chair EMPOR has he.NOM lifted.PTCP
 ‘He lifted the chair into the air’
- c. ??Das Licht aus hat er gemacht
 the.ACC light AUS has he.NOM made.PTCP
 ‘The turned off the light’
- d. *Die Sonne auf geht im Osten
 the.NOM sun AUF goes in.the east
- e. *Die Wand an hat er gemalt
 the.ACC wall ON has he.NOM painted.PTCP
- f. *Den Müll weg hat er geworfen
 the.ACC trash WEG has he.NOM thrown.PTCP

(143a) is clearly the most acceptable example, but is an outlier, suggesting that predicates like *zu machen* (close) receive a different syntactic analysis (e.g. adjective + light verb).

In sum, it is not obvious that all particle verbs should receive the same syntactic analysis, the best candidate in my view is an analysis in which the particle phrase is a complement to the verb, and can establish a wide range of relationships with the direct object, or fail to do so (also see McIntyre 2007 on the challenges for any unified analysis). Crucially, for our purposes, it does not really matter whether all particle verbs have the same syntax, what matters is to what extent they have the same syntax as prefix verbs (I have argued that they do not) and resultatives (I have argued that their syntax is indeed very similar, but that neither includes a small clause or similar constituent). In the next subsection, I will

address in more detail how prefixed and particle verbs are interpreted. Here, it will matter that particles, though phrasal, stand in a local relationship to the verb (cf. Zeller 2001a).

4.3.2 INTERPRETATIVE PROPERTIES

It has frequently been noted that prefixed and particle verbs must allow for ‘special’ meanings to arise in a local domain in order to account for the frequently non-transparent meaning of such verbs (see in particular Wunderlich 1983; Stiebels 1996; Lüdeling 2001; Zeller 2001a; McIntyre 2002; Müller 2002). This is most obviously true for the least transparent verbs, some of which are listed in (144).

- (144)
- a. ver-stehen, PFX-stand, ‘understand’
 - b. über-legen, PFX-lay, ‘think, consider’
 - c. be-nehmen, PFX-take, ‘behave’
 - d. an-fangen, PRT-catch, ‘start’

In addition to these verbs, in which the meaning of the verb without the preverbal element is not obviously related to the meaning of the verb with the preverbal element, recall in this connection the existence of prefixed and particle verbs (repeated from (132)) where the verb without the preverbal element does not exist at all, in the sense of there being no interpretation that the unprefixed verb can be assigned.

- (145)
- a. ver-gessen, ‘forget’, *gessen
 - b. ver-letzen, ‘hurt’, *letzen
 - c. be-ginnen, ‘start’, *ginnen

Importantly, as illustrated above, it is not the case that separable particle verbs are always transparent, instead, the transparency dimension cross-cuts separability in an unpredictable fashion. This means that both prefixes and particles must be in a local relationship with the verb that allows for allosemantic interpretation of both the prefix/particle and the Root. In this section, I sketch how allosemy applies in this configuration, building on insights from Zeller (2001a), who assumes that non-transparent verbs

tations of the verb *ver-fahren* (1: ‘use up by driving’, 2: ‘get lost by driving’) are illustrated.

- (149) a. Tom hat das ganze Benzin ver-fahren
 Tom has the.ACC whole gas VER-driven.PTCP
 ‘Tom used up all of the gas driving around’
- b. Tom hat sich total ver-fahren
 Tom has REFL totally VER-driven.PTCP
 ‘Tom got totally lost driving’

In the present framework, we can capture the fact that the Root transparently contributes the ‘drive’ meaning to both verbs by assuming that the prefix *ver-* is subject to allosemy. Importantly, given the general interpretation of prefixed verbs we assume here, the resulting complex verbs will not end up with completely opaque interpretations. Instead, *ver-* will contribute different end states in the two verbs, with concomitantly different interpretations of the Theme argument. In particular, repurposing the semantic characterizations in Stiebels (1996), I will assume that (149a) features an alloseme of *ver-* that leads to an interpretation of the Theme as used up or consumed over the course of the event.

- (150) (das Benzin) verfahren, $[[ver_a - fahren]] = \lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{driving}(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{consumed}(s)$

In contrast, (149b) showcases a different alloseme of *ver-* which indicates that the Theme finds itself in an end state that differs from the intended one, i.e. is false or deviant.

- (151) (sich) verfahren, $[[ver_b - fahren]] = \lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{driving}(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{deviant}(s)$

Two notes are important here. First, it should be clear that these end states are much more abstract and less specific than the end state specifications that we saw with RSPs or *zer-*. Crucially, the interpretation of these verbs nonetheless strongly resembles that of resultatives, justifying the use of the same semantic template, with differently specified contributions at Pred₂.

Secondly, the allosemy of the prefix must be conditioned by the Root (because not all prefix allosemes

can occur with all Roots), but it cannot be *determined* by the Root (because we can end up with more than one interpretation of a prefixed verb). This highlights the limits of the ‘allomorphy analogy’ as described in chapter 2. The two allosemes of *ver-* that we see above are available in the context of the Root $\sqrt{\text{DRIVE}}$, but the Root does not adjudicate between them.

We are now ready for a significant complication: As one may have suspected, Pred_1 is also subject to allosemy (along the lines of the discussion of *Root allosemy* in chapter 2). For instance, in *be-treten* (enter), *be-* appears on one of its typical meanings (roughly, *become interior to*), but *treten* contextually means *walk*, rather than *kick*.

- (152) a. Luisa hat gegen die Tür getreten
Luisa has against the door kicked.PTCP
‘Luisa kicked the door’
- b. Luisa hat das Zimmer be-treten
Luisa has the.ACC room BE-kicked.PTCP
‘Luisa entered the room’

I propose to analyze Root allosemy in these verbs analogously to prefix allosemy, i.e. by changing Pred_1 in accordance with the allosemic interpretation of the Root.

- (153) $[[be - treten]] = \lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{walking}(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{interior}(s)$

The reader may at this juncture wonder about the granularity of this analysis. If the base verb always contributes Pred_1 and the prefix contributes Pred_2 , even if they are both subject to allosemy, why not further decompose the semantics to that effect? The reason is that the generality of the change-of-state semantics for prefixed verbs is greater than our ability to consistently attribute the Means specification to the verbal Root and the end state to the prefix. Consider again in this connection the interpretation of the prefix *er-*, which, as we saw in 4.3.1.1, contributes the end state ‘dead’ in many prefixed verbs. This prefix also occurs in de-adjectival change-of-state verbs, see (154).

- (154) a. er-röt-en (redde, *röten_V)
 b. er-bitter-n (embitter, *bittern_V)

Our general change-of-state semantics continues to capture the meaning of these verbs well. However, note that in these verbs, the adjectival Root describes the end state, i.e. contributes Pred₂, and the Means predicate remains unspecified, cf. (155):

- (155) $\lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{Pred}(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{red}(s)$

As this example shows (many more could be given), the challenge in analyzing the regularities and sub-regularities in prefix verb meaning arises from the fact that their meanings can be decomposed, but not into stable parts that can be consistently attributed to particular morphemes. In my view, this state of affairs strongly favors an analysis in terms of allosemy over an alternative analysis that posits large sets of prefixes with different interpretations (i.e. *ver*₁-, *ver*₂-, *ver*₃-...), be it in the lexicon or in the syntax. The interpretation of both the prefix and the Root are inescapably contextual, to the extent that, in some cases, they cannot even be stated separately, while at the same time remaining identifiably complex (in the sense of multipart).

Given that the interpretation of particle verbs is much less uniform than that of prefix verbs, I have less to say about how the combined denotations of particle verbs come about at this stage. Recall once more, however, that particle verbs, like prefix verbs, can display mutual conditioning of allosemy between the particle and the Root. Structurally, this means they must be in a similarly local configuration, but, as we saw in the previous subsection, they cannot be analyzed as part of the complex head. I proposed there, broadly following Zeller (2001a), that particles must be represented as phrasal complements of the verb, but cannot be dominated by any other functional material. As we will see in the next section, where we will finally bring together what we have learned about resultatives, prefixes, and particles, this conclusion is supported by the fact that resultatives are always interpreted transparently, in contrast to particles.

4.4 PREVERBAL ELEMENTS: STRUCTURE AND INTERPRETATION

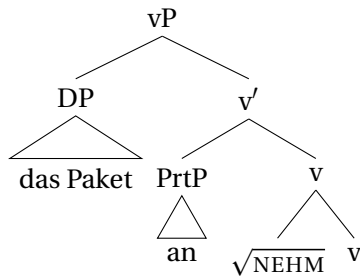
Finally, we are in a position to bring together the results from the previous sections and relate them to the primary empirical goals in this chapter. First, we will consider what we have learned about the co-occurrence restrictions and their causes. Recall that the main claim is that phrase-structural and event-structural forces have to conspire to produce the overall set of restrictions, as summarized in the following table, repeated from page 93.

	Allowed	Structure Predicts	Interpretation Predicts
px-px	✗	✓	✗
px-PRT	✗	✗	(✓)
PRT-px	✓	✓	(✓)
PRT-PRT	✗	✗	(✓)
RSP-px	✗	✓	✗
RSP-PRT	✗	✗	(✓)
RSP-RSP	✗	✗	✗
px/PRT-RSP	✗	✗	✗

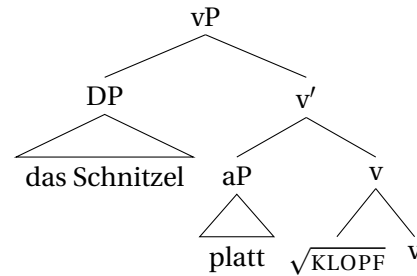
Table 5: Co-occurrence restrictions.

Under the approach presented here, the incompatibility of these elements arise from two basic factors. Structurally, particles and RSPs are represented as phrasal complements to the verb in the syntax.

(156) Separable particles



(157)



Because the verb can take only one complement, these elements are structurally incompatible. Semantically, prefixes, RSPs, and some but not all particles compete to specify the end state in a complex event.

(158) $\llbracket v \rrbracket = \lambda x \lambda e_1 \exists e_2 \exists s . \text{Means}(e_1, e_2) \ \& \ \text{Pred}_1(e_2) \ \& \ \text{Theme}(e_1, x) \ \& \ \text{End}(e_1, s) \ \& \ \text{Pred}_2(s)$

The complex event semantics is triggered in a configuration in which an event and a state description are local to each other. Because Pred_2 can only be specified once, these elements are incompatible. This can be seen as an implementation of Tenny's Generalization in the domain of complex events: because the end state can only be specified once, the event can only be delimited once (also cf. Giannakidou and Merchant 1999; Creemers 2020).

(159) *The Single Delimiting Constraint*

The event described by a verb may only have one measuring-out and be delimited only once.

(Tenny 1994: p.79)

Thus, as the last column of the table indicates, combination of RSPs and prefixes are primarily ruled out due to the ban on multiple end states for an event. On the other hand, the unavailability of particle verbs with RSPs is due to the fact that RSPs cannot attach to phrasal VPs. Of course, some RSP-particle verbs are

additionally also ruled out semantically, because some particles introduce end states. Crucially, however, two phrasal complements to the verb are ruled out anyway, such that even semantically compatible particles cannot co-occur with each other or with resultatives.

For prefix and particle combinations, the structural component of this analysis correctly predicts that prefixes inside of particles are allowed, while particles inside of prefixes are not, without relegating prefixation to the lexicon. Consider again the examples of *PRT-pfx-verbs* from section 4.1 (there (84)), repeated in (160). As was discussed there, this is the by far least restricted class of verbs with more than one preverbal element. We have now seen that these combinations are predicted to be possible structurally and semantically as long as the particle does not introduce a competing end state.

- (160) a. *nach-be-arbeiten* ('rework', 'go over something again', cf. *be-arbeiten* 'edit', 'process')
- b. *aus-er-wählen* ('choose', cf. *er-wählen* 'choose')
- c. *an-ver-trauen* ('entrust', cf. *ver-trauen* 'trust')
- d. *vor-ent-halten* ('withhold', cf. *ent-halten* 'withhold')
- e. *um-ent-scheiden* ('redecide', cf. *ent-scheiden* 'decide')
- f. *ab-er-kennen* ('dispossess', 'deprive', cf. *er-kennen* 'realize', 'recognize')

These examples in fact instantiate at least two different ways for a particle to combine with a prefix verb. In *nach-be-arbeiten* (rework), the particle contributes an the interpretation that something is worked on again after having previously edited or processed. As such, the particle does not compete with the specification of the end state already specified by the prefix, in fact, it is of course impossible to rework something that is not already in the state of having been worked on previously.

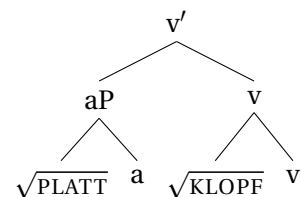
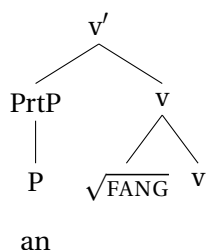
Verbs like *ab-er-kennen* (dispossess, deprive) instantiate a more complicated pattern. At first glance, in this verb, the particle triggers a different alloeme of the Root: *ab-er-kennen* is not transparently related to *er-kennen* (realize), and *ab-* would seem to introduce a different end state in that configuration. If this were an inescapable conclusion, it would constitute a counterexample to the present account: In order for the proposed implementation of Tenny's generalization to hold, we cannot allow end states to be overwritten. On closer inspection, however, this example merely requires a more literal translation

to be compatible with our claims. *er-kennen* can also be translated as ‘recognize’, *ab-er-kennen* means ‘de-recognize’ on this view (though with a slightly different meaning than this verb has in English), and as such is much more transparent than the first glance suggested.

As we have seen, the discussion surrounding the syntax and semantics of resultatives in many ways mirrors and involves the discussion of prefixed and particle verbs. All three kinds of elements have been analyzed as small clause structures (although inseparable prefixes less frequently so), and all three have alternatively received a complex head or otherwise complex predicate analysis. The discussion crucially revolves around the argument structure of Themes in particular: As an argument of which predicate or part of the predicate is the Theme introduced? I have suggested that the underlying reason for the entanglement between the preverbal elements is that they all contribute to complex event descriptions, and in particular contribute end states to complex change events.

Alongside all of these similarities, however, there is also a systematic difference between prefixes and particles on the one hand and RSPs on the other when it comes to interpretation. As we saw in the previous section, a crucial fact about the interpretation of prefixes and particles is that they frequently condition Root polysemy. This is not true of RSPs in the same way: RSP+verb combinations show special argument-taking behavior and ‘interact’ semantically (in the sense of appearing in the resultative semantics together), but they are always transparent. I argue that this follows from conditions on the locality of allosemy, specifically from the fact that, unlike particles, resultatives are categorized before they combine with the verb. Consider, one more time, the structure of a particle verb and a resultative side by side, focusing on the internal structure of the PrtP and aP, respectively.

- (161) *an-fangen* ('start', non-transparent particle verb)
 (162) *platt klopfen* ('pound flat', transparent resultative)



As discussed in section 4.3.1, it's not clear *why* the particle projects a phrase (more on this issue in the next chapter), but it is clear that it must do so. Crucially, however, there is no other functional material within the particle phrase. In terms of the locality domain for Root allosemy, this means that the particle, the Root, and v all find themselves in the same domain. In (162), on the other hand, the RSP contains a categorized Root, as such, the aP forms its own domain for Root allosemy. For this reason, resultatives are interpreted transparently.

Note that this suggests a quite nuanced response to the questions from chapter 2 regarding the locality of allosemy. I have suggested above that RSPs and v do interact in their interpretation, in that they give rise to the configuration that triggers the complex event semantics, and thus interact for argument introduction and so on. What the transparency of resultatives shows us is that Root allosemy follows stricter locality conditions. I will return to this point in the next chapter. Note for now that this underscores the importance of separating allosemy from idiom interpretation. Non-transparent particle verbs are not idioms, they do not have a literal meaning. Instead, their interpretation is fixed in a very local domain. Crucially, the process of interpreting complex predicates as illustrated in this chapter also has nothing to do with idiom interpretation. Idioms receive a more or less arbitrary, highly specialized interpretation at a phrasal level. By stark contrast, we saw that the interpretation of complex predicates is highly general.

In sum, the present case study illuminates allosemy as follows: It highlights that different types of contextual interpretative effects must be recognized. We saw that this is not simply a matter of distinguishing allosemy and idiom interpretation, but rather, that there are different types of contextual inter-

pretation even within the ‘allosemy’ umbrella. The case study also shows that prefixes, RSPs and some particles are interpreted alike in a specific sense, namely as contributing end states to the complex event, but that this general interpretation allows for many idiosyncratic specifications of that end state. Finally, we saw that RSPs must be interpreted transparently, in spite of being tightly linked to the complex predicate’s interpretation. This, I suggested, follows from the determination of Root interpretation at a local level.

To conclude this section, I would like to discuss briefly what this analysis has to say to the observation that stative participles are impossible as the RSP in resultatives. It has long been observed for English that stative participles cannot occur in the resultative construction, in spite of their otherwise adjective-like distribution (cf. Green 1972; Embick 2004; Kratzer 2005).

- (163) a. *The metal was hammered flattened
 b. *Das Metall wurde geplättet gehämmert
 the metal was flattened hammered

This fact is initially unexpected under most syntactic analyses of resultative formation. As we have seen, RSPs contribute an end state to the complex predicate. Participles, of course, are easily interpreted as states, and are in fact often analyzed as adjectival. Why, then, can they not occur in this structure? In SC approaches, two possibilities suggest themselves: it could be that participles are, for whatever reason, generally impossible in SC structures. This, however, is easily counterexemplified by the occurrence of participles in uncontroversial small clauses (cf. Oppenrieder 1991 on this point):

- (164) Er sah [sein Land von Feinden umringt]
 he saw his country by enemies surrounded
 ‘He saw his country surrounded by enemies’

A second explanation is proposed in Kratzer (2005), who argues that only inflectionless adjectives can occur in RSPs because only they can incorporate into the verb. However, in light of the data discussed in section 4.2 above, it becomes clear that the unavailability of participles in resultatives cannot be due to

their phrasal status.⁵¹

Instead, it seems plausible that only phrases denoting states that are possible end states in the MR predicate can occur in resultatives, and that stative participles fail to meet this criterion because they *already* denote an end state (of an event identified by the verbal Root). In order to implement this technically, the change semantics must already apply to the participle (cf. Biggs and Embick [in prep](#)).

From this perspective, two consequences of adopting allosemy for syntactic theory come into focus. The first echoes our findings from chapter 3: adopting allosemy allows us to reject structural disambiguation strategies that lead to elaborate syntactic structures that are not supported by the syntactic evidence, often in favor of ‘smaller’ syntactic structures. It’s important to stress that ‘smaller’ syntax is not a goal onto itself, but is motivated in cases where the syntactic properties of a structure in terms of modification, case assignment, movement etc. do not support the ‘larger’ syntax (cf. Wood [2023](#); Embick [2023](#)). The present case study also highlights the flipside of this strategy: to capture the fact that e.g. prefixes and resultatives have similar effects on argument structure, but distinct effects on Root meaning, the latter kind of effect must be constrained to a very local domain. This is incompatible not just with small clause approaches to preverbal elements, but also other proposals that make use of an elaborated VP syntax to account for the event- and argument-structural side of these phenomena (e.g. McIntyre [2004](#); Ramchand [2008](#)).

4.5 DISCUSSION

In this chapter, I have argued for an analysis of the co-occurrence restrictions that capitalizes on independently motivated syntactic and semantic factors, instead of pursuing a one-factor analysis, which, as I have argued, is impossible due to the range of structural differences and interpretative differences that we find with preverbal elements in German. In this final section, I will discuss some potential empirical issues to the claims in this chapter. Section [4.5.1](#) discusses exceptions to the co-occurrence restrictions. As we will see, there are exceptions, but they behave as exceptions, that is to say, they do not challenge

⁵¹Nor should it serve as the basis for claiming that resultatives are formed in the lexicon.

the generalizations at play. Finally, in section 4.5.2, I will discuss so-called ‘weak’ resultatives and the extent to which they pose a challenge to the claim that events can only be delimited once.

4.5.1 THE CO-OCCURRENCE RESTRICTION: EXCEPTIONS

In this subsection, I will discuss some of the exceptions to the co-occurrence restrictions detailed in section 4.1. The purpose of this is to show that these are truly exceptional in character for a variety of reasons, and thus unlike *PRT-pfx-verbs*, which I argued are not an exception but rather are expected to be possible so long as they do not violate the ban on multiple end states.

Stiebels and Wunderlich (1994) note a few exceptions to the ban on multiple prefixation, given in (165), which they claim mostly result from backformation.⁵² These exceptions involve as the outer prefix an element that also occurs as a preposition (*über* ‘over’ and *unter* ‘unter’); it is worth pointing out that even these elements do not attach freely to verbs that are already prefixed (165c-d).

- (165) a. *über-er-füllen* (‘overfulfill’, ‘exceed’, cf. *er-füllen* ‘fulfill’)
 b. *unter-be-werten* (‘undervalue’, cf. *be-werten* ‘value’)
 c. **über-ver-stehen* (intended: understand too well, cf. *ver-stehen* ‘understand’)
 d. **unter-be-bauen* (intended: insufficiently build on, cf. *be-bauen* ‘build on’)

In general, *über-* and *unter-* are clearly semantically distinct from other scalar prefixes, in that they have scale-modifying properties (cf. Risch 1995; Gast et al. 2025). A second complication concerning the exceptions in this category is that they involve elements which, in addition to occurring as a prefix, can also occur as a separable particle. If the elements were attaching as particles in the examples above, this would naturally disqualify them as exceptions to the ban on multiple prefixation, given that, as we saw above, *particle+prefix+verb* is a more widely available combination of preverbal elements (in fact, the only more widely available one). The reason that it is nonetheless important to consider them as potential exceptions to the ban on multiple prefixation instead is that they are not typically stranded

⁵²Stiebels and Wunderlich (1994) do not provide evidence or citations for this claim, but it does seem plausible that these verbs are backformations from participles such as ‘unter-bewertet’ (undervalued), with which these prefixes combine frequently.

under V2, though it should be noted that moving them along also produces degraded results, and that both stranded and non-stranded examples are attested in corpus data.⁵³

Further complicating the picture, the outer prefix is separated from the verb by infinitival ‘zu’ (166c), a behavior typically found with particles, not prefixes:

- (166) a. *Er er-füllt unsere Ziele über
he ER-fills our goals OVER
- b. ?Er über-er-füllt unsere Ziele
he OVER-ER-fills our goals
‘He overfulfills our goals’
- c. Er versucht, unsere Ziele über-zu-er-füllen
he attempts our goals OVER-ZU-ER-fill
‘He attempts to exceed our goals’

A further exception is given in (167). Like the examples with *über-* and *unter-* followed by another prefix, the behavior of *missverstehen* as a complex verb has the quirk that while *miss-* has to move with the verb under V2 (more exceptionlessly so than in the cases discussed above), it is separated from the verb by infinitival ‘zu’.

- (167) a. Luise miss-ver-steht meine Anweisungen
Luise MISS-VER-stands my instructions
‘Luise misunderstands my instructions’
- b. Ich bitte, mich nicht miss-zu-ver-stehen
I ask me.DAT not MISS-ZU-VER-stand.INF
‘Please don’t misunderstand me’

The mixed behavior of *missverstehen* and the other verbs that form exceptions to the ban on multiple

⁵³Consider e.g. (i), both examples are somewhat marginal in my judgment:

- (i) a. Und wie es das Leben will, **übererfüllte** er den Plan um wenige Sekunden.
and as it the life wants OVER-ER-filled he the plan by few seconds
‘And as life goes he outperformed the plan by a few seconds’ [Die Welt, 08.07.2000]
- b. Sobald der Betrieb einen ganzen Azubi anstellt, **erfüllt** er die Quote also **über**.
as.soon.as the company a whole apprentice hires ER-fills it the quota thus OVER
‘As soon as a company hires one whole apprentice, it thus exceeds the quota.’ [Der Tagesspiegel, 02.04.2004]

prefixation is an indication that they should not be seen as counterexamples that threaten the generalization, but rather as cases whose exceptional behavior confirms that the system can only accommodate doubly prefixed verbs by treating them at least partially as particle verbs (cf. Murphy 2021 for related considerations of the mixed behavior of verbs that are analyzed as backformations).

To summarize, combining the verb with more than one inseparable prefix is usually not possible, although there is a set of semi-systematic exceptions involving prepositional prefixes and some backformations. However, even those verbs do not behave as regular prefix verbs syntactically.

There are a few potential counterexamples to the ban on multiple particles as well. One class involves adverbial elements *wieder* ('again') and *mit* ('with'), but as Stiebels and Wunderlich (1994) point out, word order facts suggest that these attach higher up (presumably at the VP level):⁵⁴

- (168) a. Kannst du dir die Pläne (mit) ansehen?
 can you.NOM you.DAT the plans MIT AN-see
 'Can you also have a look at the plans?'
 b. Kannst du dir (mit) die Pläne ansehen?
 can you.NOM you.DAT MIT the.ACC plans AN-see
 c. *Kannst du dir an die Pläne sehen?
 can you.NOM you.DAT AN the plans see

As this example shows, *mit* is (sometimes) unlike regular particles in being able to appear in a position preceding the object, it is also syntactically optional in these examples, supporting an adverbial analysis (Murphy 2021).⁵⁵ However, as Murphy (2021) points out, this class needs to be distinguished from a small class of particle verbs like *mit-nehmen* (take along), where *mit-* is not adverbial, as evidenced by the fact that it is not optional. As Murphy shows, it can nonetheless be separated from the verb by a PP:

- (169) a. wenn man das Kind ins Büro mit-nimmt
 if one the.ACC child in.the office MIT-takes
 '..if one takes their child with them to the office' Murphy (2021)

⁵⁴Here I am choosing to use different examples from Stiebels and Wunderlich that I believe better serve to make this point.

⁵⁵Note that orthographic conventions in this area are of little help, as *mitansehen*, *mit ansehen* can be spelled together or separately in most contexts according to the Duden.

- b. wenn man das Kind *(mit) ins Büro nimmt
if one the.ACC child MIT in.the office takes

Crucially, as far as I can tell, all examples of MIT/WIEDER-PRT-verb fall into the adverbial class, and thus do not constitute genuine counterexamples.

Other potential exceptions from the ban on *PRT-PRT-verb involve backformation from a complex noun (170a) or reanalysis of the two particles in question as one particle (170b).

- (170) a. vor-an-melden ('preregister', backformation)
b. voran-gehen ('lead the way', reanalysis)

Note that the two can be distinguished through stress assignment as well as by separability: *vóranmelden* in (170a) (from *Voranmeldung* 'preregistration') is stressed on the first syllable. As is typical for backformation, it shows mixed behavior with respect to separability: in the case of *voranmelden*, the particles can neither be stranded, nor moved, resulting in ungrammaticality for all but verb-final configurations.

- (171) a. Ich möchte mich vor-an-melden
I would me.DAT VOR-AN-register
'I would like to preregister'
b. ??Ich melde mich vor-an
I register me.DAT VOR-AN
intended: 'I am preregistering'
c. *Ich vor-an-melde mich
I VOR-AN-register me.DAT
d. *Ich an-melde mich vor
I AN-register me.DAT VOR

In contrast, *vorángehen* is stressed on the second syllable, and the reanalyzed particle *voran* can be stranded:

- (172) Ich gehe heute voran
I go today VORAN
'I'm leading the way today'

To summarize, combinations of more than one particle are almost entirely impossible, regardless of semantic compatibility and syntactic category of the individual particles. Exceptions fall in one of two classes: backformations with characteristically irregular behavior, and a class of verbs with reanalyzed particles that are only seemingly complex.

Following the theme of this section, the exceptions to **pfx-PRT-verb* collected by Stiebels and Wunderlich (1994) again have very particular properties, as is also noted by the authors, such as being derived from Roots that cannot occur by themselves, or with the prefix attaching to a particle verb that does not exist without the prefix.

- (173) a. ver-ab-reichen ('administer', *abreichen)
 b. über-an-strengen ('overstrain', *strengen)
 c. be-auf-tragen ('engage', denominal)

We saw in section 4.3.1 that verbs with missing bases, as in (173a,b), require a special condition that allows the Root to be licensed only in the context of a prefix. While the details of this proposal require future work, it seems plausible that the complex predicate cannot be interpreted until its component parts are licensed in the structure.

Evidence for the denominal status of *beauftragen* (173c) comes from inflection. As Stiebels and Wunderlich (1994) also point out, *beauftragen* inflects as a weak verb, whereas deverbal prefix and particle verbs always maintain the strong inflection class of the Root:

- (174) a. tragen → trug ('carry', strong preterite)
 b. auf-tragen → auf-trug ('instruct', strong preterite)
 c. be-auf-tragen → be-auf-tragte ('engage', weak preterite)

In addition to *beauftragen*, Vikner (2005) discusses the verbs in (175) as verbs of this denominal category.

- (175) a. be-ein-drucken ('impress', denominal)
 b. be-ein-flussen ('influence', denominal)

- c. ver-*aus-gaben* ('over-exert', denominal)

Similar arguments for the clear exceptionality of these verbs apply: all three verbs inflect weakly, and in all three cases the Root appears in the form it takes in the nominal, rather than the verbal context, compare the nominals and verbs in (176):

- (176) a. Ein-*druck* (impression), ein-*drücken* (press in)
 b. Ein-*fluss* (influence), ein-*fließen* (contribute)
 c. Aus-*gabe* (expenditure), aus-*geben* (spend)

To summarize, **pfx-PRT-verb* are generally ruled out, again with a few telling exceptions. In this subsection, I have shown that other counterexamples to the generalizations in this chapter exist, but have a different character than *PRT-pfx-verbs*, which are possible under certain circumstances.

What I have shown in this chapter is that purely syntactic accounts of the co-occurrence restrictions, whether they are formulated in terms of small clauses or in terms of ResP and other elaborated projections in the verb phrase, are neither necessary nor sufficient to account for the complexities of the pattern in German. It's easy to see how they are not sufficient – they incorrectly rule out *PRT-pfx-verbs*, and they a priori predict that prefixes, particles, and resultatives should behave identically syntactically and for purposes of further derivation, neither prediction is correct. Of course, that is not to say that such an analysis could not be amended to capture these facts. Crucially, however, the semantic component of the present approach also shows that a templatic solution is not necessary. If it is true that a single event cannot be delimited more than once, then there is no reason that the syntax should prohibit multiple projections that could encode an end state. In the final subsection, I will briefly discuss whether so-called 'weak' resultatives, which I have set aside until now, challenge this conclusion.

4.5.2 WEAK RESULTATIVES

It has long been noted in the literature that there is a class of resultative-like structures that in various ways challenge some of the generalizations put forth in this chapter and elsewhere. A few examples from

German and English are provided in (177).

- (177) a. Sie hat die Wand bunt be-malt
 she has the.ACC wall colorful BE-painted.PTCP
 ‘She painted the wall colorful’⁵⁶
- b. Die Halle war hell be-leuchtet
 the hall was bright BE-lit.PTCP
 ‘The hall was brightly lit’
- c. The lake froze solid
- d. The cookie crumbled onto the floor

Adopting the terminology from Washio (1997), I will refer to these as ‘weak’ resultatives (though Washio classifies some specific examples differently). To understand what a weak resultative is, consider the definition provided by Washio for a strong resultative:

- (178) ‘*STRONG resultatives: In resultatives of this type, it is impossible to predict from the semantics of the verb what kind of state the patient comes to be in as the result of the action named by the verb.*’
 (Washio 1997: p.7)

This holds of most of the examples of resultatives that we have seen in this chapter. Nothing about *kissing*, for example, predicts that someone will be kissed *awake*. A *weak* resultative, in contrast, is one that does not fulfill the above requirement: the verb names its end state or makes it predictable. Consider now the examples above. In (177a,b), a prefix seemingly occurs with an RSP, a combination that I claimed was not possible. For (177b), we might be able to argue with Kratzer (2005) that such examples involve adverbial modification rather than RSPs. But in (177a), this seems less plausible: surely, *bunt* (‘colorful’) is a property of the painted end result, not of the painting event. Similarly, in (177c), the RSP seems, in some sense, superfluous, as a specific end state is already entailed by the verb.⁵⁷ (178d) shows that verbs of this kind also freely combine with directional PPs, which is not ruled out on the present account (we

⁵⁶Incidentally not very good in English, but cf. *She painted the wall blue*.

⁵⁷Note, however, that some native speakers report the intuition that a body of water has to freeze ‘all the way through’ to be considered *frozen solid*.

set directional PPs aside early on), but potentially problematic on many other accounts of resultatives (cf. Goldberg 1995; Rappaport Hovav and Levin 2001; Beavers 2012). While I can not offer a comprehensive account of weak resultatives in the present context, it seems fair to assert that they must have some systematically different properties from strong resultatives. This is also strongly supported by the cross-linguistic observations reported by Washio (1997). Cross-linguistically, weak resultatives sometimes exist in languages that do not allow strong resultatives, for example, some speakers of Italian allow color-term resultatives in spite of the fact that Romance famously generally lacks resultatives.

- (179) Ha dipinto la macchina rossa
 has painted the car red
 'He painted the car red.' (Napoli 1992)

To conclude, I have argued in this chapter that the co-occurrence restrictions between preverbal elements in German are illuminated by a differentiated analysis of their syntax and interpretation. One crucial component of this analysis was that particles and RSPs, but not prefixes, project phrases in the vP structure. In the next chapter, we will see how this conclusion interacts with the analysis of nominalizations as complex heads that I supported in chapter 3, and uses nominalizations to further inform our theory concerning the locality of alloosemy.

5

PREFIXES IN NOMINALIZATIONS

5.1	PARTICLE VERBS NOMINALIZED: THE STRUCTURE PROBLEM	152
5.2	NOMINALIZED INFINITIVES	159
5.3	<i>-ung</i> NOMINALIZATIONS	163
5.4	<i>Ge-</i> <i>-e</i> NOMINALIZATIONS	171
5.5	CONSTRAINTS ON MULTIPLE DERIVATION . .	182

In this final chapter, I turn to the task of bringing together some of the results from the previous two case studies by taking a closer look at nominalizations of morphologically complex verbs. Several sets of interesting questions arise in this empirical domain, and we have already encountered some of them in the previous chapters. The first set concerns the internal syntactic structure of deverbal nominalizations from complex verbs, especially from particle verbs. In chapter 3, I adopted a ‘small’ analysis of nominalizations as complex heads to account for the lack of VP-modifiers and the locality of alloselection. In chapter 4, I argued that particles must be represented as phrasal in the syntax to account

for their separability. In section 5.1 I discuss the fact that these claims create a tension, and how we might distinguish between different ways of addressing that tension. In nominalizations, neither prefixes nor particles are ever separable, which is a trivial-sounding but surprisingly challenging fact. If nominalizations with particles include any amount of verbal structure, it does not automatically follow that nominalization would preclude separation of the particle, certainly not if the nominalization includes phrasal verbal projections. As we saw in the last chapter, in a complex head adjunction structure, the inseparability is expected as part of a general ban on excorporation (cf. Baker 1988). However, as we have seen, the complex head analysis is typically reserved for prefixed verbs that are inseparable in the verbal domain, and extending it to particles without losing the insight that phrasal particles must be stranded in the verbal domain is not straightforward. More generally, it has been argued that particles cannot be phrasal if they form the input to word-formation processes (this is what I will refer to as ‘the structure problem’, following Lüdeling (2001)). Three general ways out of this dilemma exist, all of which have been proposed in the literature:

1. **The ‘phrasal inputs’ solution:** Deny that phrases cannot be the input to word formation.
2. **The ‘particles-as-heads’ solution:** Analyze particles as heads in the nominal domain.
3. **The ‘outer attachment’ solution:** Argue that particles are phrasal in the nominal domain, but attach outside of the nominalizer, thereby avoiding a ban on phrasal material inside the nominalization.

In this chapter, I will argue that three different processes of nominalization in German, nominalized infinitives, *-ung*-nominalizations, and *Ge-* *-e*-nominalizations, each point to a different strategy out of the three sketched above.

This, I argue, is tied to a second set of questions, concerning which verbs can be nominalized in the first place, and in particular how preverbal elements factor into nominalizability. As initial examples, (180) shows the simplex verb *rösten* (roast) and the particle verb *ein-führen* (introduce), both of which allow all three nominalizations:

- | | | |
|-------|--|--------------------------------------|
| (180) | a. das Rösten (the roasting) | nominalized infinitive |
| | b. das Ein-führen (the introducing) | |
| | c. die Röst-ung (the roasting) | <i>ung</i> -nominalization |
| | d. die Ein-führ-ung (the introduction) | |
| | e. das Ge-röst-e (the roasting) | <i>Ge-</i> <i>-e</i> -nominalization |
| | f. das Ein-ge-führ-e (the introducing) | |

The grammatical and interpretational nuances associated with the different formations do not always translate well into English, but will be described below. As we will see in section 5.2, nominalized infinitives are available with great regularity for any German verb, including morphologically complex verbs. This will provide a contrast to other kinds of nominalization in German. *-ung*-nominalizations are much more restricted, and interact with preverbal elements in interesting ways, this is the focus of section 5.3. Some preverbal elements, especially prefixes, seem to essentially potentiate *-ung* nominalization, in the sense that *-ung* nominalizations are available with prefixed verbs, but not with the corresponding simplex verb that is the basis for prefixation (e.g. *Be-arbeit-ung* ('editing') but **Arbeit-ung*).

Roßdeutscher and Kamp (2010) have argued that there is a *bi-eventivity* constraint on the inputs to *-ung* nominalization, in our terms, this would mean that only complex change-of-state verbs can be *-ung*-nominalized (also cf. Pross 2019). I suggest below that although there are complications to this claim, it is a better generalization than alternatives, and it does explain why *-ung*-nominalization is often available with prefixed and (a subset of) particle verbs – as we have seen, these verbs typically have change-of-state interpretations. From this perspective, two connections to the findings from the previous chapter emerge: first, it is somewhat surprising on this view that RSPs are not possible in *-ung* nominalizations, given that they share many event structural properties with prefixed verbs. This suggests that we should prefer a solution to the 'structure problem' for particle verbs that has them pattern with prefix verbs, to the exclusion of resultatives – the 'particles-as-heads'-solution.

Secondly, the value of an allosemy analysis of prefixed verbs becomes especially apparent, given that analyses of the kind proposed by Roßdeutscher and Kamp (2010) and Pross (2019) require reference to

the semantic makeup of the structure to which *-ung* is attached. In section 5.4, I add a comparison with *Ge-* *-e* nominalization, a lesser studied type of nominalization which is more restricted than nominalized infinitive formation, and differently restricted than *-ung* nominalization. I argue that *Ge-* *-e* has two particularly interesting properties: It cannot include inseparable prefixes, and furthermore shows a split with respect to which RSPs can form part of the nominalization and which cannot. As we will see, the evidence from *Ge-* *-e* nominalizations pushes us into a different direction concerning the status of particle verbs than the evidence from *-ung*-nominalization: Here, it is crucial that particles *do not* pattern with prefixes in the nominal domain, favoring the ‘outer attachment’-solution.

Finally, a third set of questions arises concerning the flip-side of nominalizable complex verbs: why are many conceivable instances of multiple derivation, including nominalization, impossible in German and other languages? We saw a narrower version of this issue in the last chapter concerning the co-occurrence restrictions among preverbal elements. However, the general issue is much broader: as we saw in that discussion, structural considerations should lead us to expect that heads in particular should stack fairly freely in complex adjunction structures. In section 5.5, I suggest that the case studies in this dissertation support allosemy (and in particular *Root* allosemy) as a limiting factor in word formation.

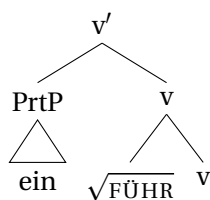
A fundamental complexity that is impossible to divorce from the questions addressed in this chapter is that it frequently requires decisions about which affixes and combinations thereof we ‘expect’ to see in the first place. Affixes can uncontroversially be specified to attach only to a specific category, for example only to a verbal stem. Beyond this, phonological and semantic restrictions are known to be at play, but which of them restrict the set of ‘expected’ combinations, and which instead work towards explaining ‘unexpected’ gaps is an impactful decision every time. In the chapter, I try to make this decision carefully on a case-by-case basis, but I hope to convince the reader that the overarching questions arise independently of the claims I might make about any individual word or combination of derivational affixes. This rationale also serves to justify the continued empirical focus on preverbal elements and nominalizations. While other kinds of affixes will also play a role in the discussion, it is desirable to focus on the ones about which we have learned the most in the previous chapters, so as to avoid making unwarranted assumptions about their morpho-syntactic behavior and interpretation.

5.1 PARTICLE VERBS NOMINALIZED: THE STRUCTURE PROBLEM

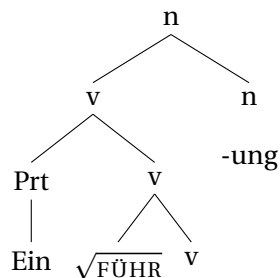
In this first section, I lay out what Lüdeling (2001) terms the ‘structure problem’ of particle verbs (a version of this problem is discussed in most treatments of particle verbs in German, in addition to Lüdeling, also see in particular the discussions in Stiebels and Wunderlich 1994; Zeller 2001a; McIntyre 2015).

The basic issue is that particles behave as phrases in some respects, but appear to pattern as non-phrasal in other respects. We have already seen the crucial instance of the former type of behavior in the last chapter: Particles are phrasal in that they are left behind by head movement, we suggested there that this requires the structure in (181). However, particle verbs are frequently involved in further derivation, crucially including in derivational processes that do not allow phrasal inputs (although this is sometimes denied, cf. Müller 2002; Bruening 2018). This suggest that they must have the structure in (182).

(181) Prefixes as phrasal



(182) Prefixes as non-phrasal



So conflicting is the evidence regarding the phrasal status of particles that many previous analyses posit an intermediate level of representation for particles, or make them otherwise exceptional in their morpho-syntactic behavior. For example, Booij (1990) argues for a level V^* between V and V' , the sole purpose of which is make available a representation that allows both types of generalizations to be stated without extending to any other type of phrasal or non-phrasal element. Stiebels and Wunderlich (1994) argue that particles carry a feature [+max] in the lexicon that essentially lets them escape Lexical Integrity⁵⁸ (by being visible to the syntax). Zeller (2001a) proposes a reanalysis operation that allows particle phrases to be reanalyzed as heads in the context of nominalizations (also cf. Groos 1989; Ackerman

⁵⁸The principle that forbids syntactic operations from operating on parts of words, cf. Di Sciullo and Williams 1987 a.m.o..

and Weibelhuth 1998 for distinct but related proposals).

The crucial common issue for all of these proposals is that any method for making particles maximal, phrasal, or otherwise separable in verbal syntax cannot apply in the nominal domain. For example, Stiebels and Wunderlich (1994) have to augment their account based on the syntactic visibility of the feature [+max] by the following constraint:

(183) Particle constraint (Stiebels & Wunderlich 1994: p. 919):

The structure $[Y^{+max} X]$ is only available for $X = V$.

Similar constraints are posited in the other approaches: though different in many details, including the direction of exceptionality, they all share the property of having to limit the exceptional status of particles to one domain (nominal or verbal).

The ‘structure problem’ has often been taken to be about the syntactic vs. lexical formation of particle verbs (given the assumption that derivational morphology applies in the lexicon and cannot access the output of syntactic derivations). I will set aside this version of the debate here: as the structures above suggest, the question is just as relevant within a syntactic theory of word formation. In the remainder of this section (and continuing throughout the chapter), I will focus on the question of whether we are compelled to adopt an analysis of deverbal nominalizations with particle verbs as in (182), and what challenges arise for potential alternatives. I will argue that although the ‘structure problem’ is typically taken to apply to all kinds of nominalizations equally, the empirical picture in fact favors a more nuanced approach, in which we entertain different solutions to the structure problem in different nominalization structures.

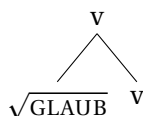
The first question that must be addressed in this respect is what we mean when we say that a nominalization is ‘deverbal’. We first encountered this question in chapter 3, there, we concluded that nominalizations with a CEN reading, nominalizations with overt verbalizers, and nominalizations with other morphology that is exclusive to verbs provide evidence for their deverbal status, while others could in principle be Root-derived. I will now look at this question in a little more detail.

Traditionally, the question of what makes a noun deverbal is considered difficult only at the margins.

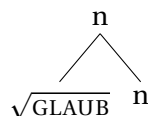
In general, the obvious answer is that a noun is deverbal if it is derived from a verbal form, such as a morphologically simple or complex verbal stem. For example, the noun *Beobachtung* ('observation') is deverbal because it is derived from the verb *beobachten* ('observe') through the attachment of the nominalizing suffix *-ung*. The noun *Tisch* 'table', on the other hand, is not deverbal because it neither semantically nor morphologically contains any kind of verbal form.

On closer inspection, however, the question of which categories are semantically and morphologically contained in one another turns out to be much more complicated, especially in a syntactic theory of word-formation with category-neutral Roots, such as DM. The descriptive category 'deverbal' is far from immune to theoretical assumptions about word-internal category change. In this connection, recall examples like the noun *Glaube* ('belief') and the verb *glauben* ('believe') from chapter 3. *Glaube* is not more morphologically complex than the verb *glauben*. It also is not morphologically simpler in the relevant sense, because the *-n* in *glauben* is the infinitival ending. Morphologically, then, we have no reason to think that either the noun is contained in the verb or vice versa. In DM, a possible analysis of this is to merge the Root $\sqrt{\text{GLAUB}}$ with *v* to produce *glauben*, and with *n* to produce *Glaube*, such that the acategorical nature of the Root is exploited.

(184) *glauben* ('believe')

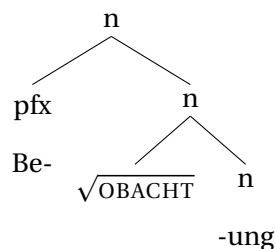


(185) *Glaube* ('belief')



This is an option that is not necessarily available in other frameworks, depending on the status of category-neutral bases of word formation. From this perspective, nothing about the noun *Glaube* in (185) is deverbal in any formal sense. Crucially, the same analysis is *in principle* available for a noun like *Beobachtung*, which also does not contain any overt verbalizer, although it does appear to contain a verb. On the Root-derived analysis, we would of course have to claim that the prefix *be-* can attach to non-verbal categories (more on this below). The point here is not to argue that this is correct, only to show that is not logically ruled out. The structure, then, would look as in (186).

(186) *Beobachtung* ('observation')



In the literature on deverbal nominalizations in English and other languages, this complication is sometimes addressed by focusing on the structure of nominalizations with overt verbalizers (see e.g. Alexiadou 2009; Harley 2009; Wood 2023). Where v is overtly realized, these authors argue, it must be present in the syntactic structure, an analysis like (186) is then unavailable. In German, there is only one overt verbalizer (with the variants *-ier*, *-isier*), and it only occurs with a relatively small number of verbs that take prefixes or particles, though there are some suggestive examples that pattern like the verb *auf-pol-ieren* ('polish (off)') in (187).

- (187) a. Er pol-ier-te die Bilanzen auf
 he polish-VBZ-PST the.ACC balance.sheets AUF
 'He improved the balance sheets'
- b. die Auf-pol-ier-ung der Bilanzen
 the AUF-polish-VBZ-NMLZ the.GEN balance.sheets
 'the improvement of the balance sheets'

As this example shows, there are prefix and particle verbs that arguably cannot be Root-derived, given that they include an overt verbalizer.⁵⁹

Note that at this point, this is an argument only about the presence of v in the structure, not about the attachment of the particle or prefix: in principle, morpho-syntactically, the preverbal elements could still attach outside of the nominalizer. As we will see, the crucial question is whether that structure could be interpreted correctly, a question that we will return to throughout the chapter.

Given that the applicability of the overt-verbalizer criterion is somewhat limited, we may wonder

⁵⁹Much as with the cognate verbalizer *-ize* in the latinate part of the English vocabulary, there are complications in how the nominalizations relate to the embedded verbs morphologically. For example, some *-ier*-verbs form *-ation* nouns in German, with the *-ier* failing to surface in the noun, compare *spekul-ier-en* (speculate), *Spekul-ation* (speculation), cf. Bierwisch (1990).

what other indications there are for the deverbal nature of a given nominalization. The second strongest morphological indication of a deverbal form are some prefixes which either never or very rarely occur in nouns without also occurring in a related verb, such as *be-* in *Be-obacht-ung* ('observation'). I believe this to be valid argument for reasons of parsimony, but, as we saw above, nothing logically *forces* the conclusion that these nouns contain verbs (as opposed to containing prefixes that are also contained in verbs).

A third kind of argument holds that at least nouns with overt nominalizers such as *-ung* have to be deverbal under the assumption that *-ung* only attaches to verbs. I believe this argument to be correct, but it is not trivially correct, as demonstrated by the fact that Pross (2019) in fact analyzes *-ung* nominalizations as deadjectival (qua participial), partially on the basis of the example *Be-gab-ung* ('talent') which exists unbothered by the lack of a base verb **be-gaben* (putatively, 'to (bestow) talent'). I will return to Pross' account in detail in section 5.3.2, for now, note that *Begabung* is an exception in this regard, and furthermore lacks an event reading. To my knowledge, there are no *-ung*-nominalization without a verbal base and with a CEN reading (cf. Borer 2014; Wood 2023).

However, even if a base-of-affixation argument for the deverbal status of these nominalizations does mostly work for *-ung*, it does not work in general. As we saw in chapter 3, there are other nominalizers in German, and not all of them are restricted to occurring with a specific category. The nominalizer *-nis*, for example, occurs in descriptively deverbal and deadjectival nominalizations:

- (188) a. die Er-kennt-nis ('realization', cf. *er-kennen* 'realize')
- b. das Ge-ständ-nis ('confession', cf. *ge-stehen* 'confess')
- c. die Wild-nis ('wilderness', cf. *wild* 'wild')

Note again that the nominalizer, from a purely morphological perspective, could be analyzed as Root-attached across the board (if we assume that prefixes can attach to nouns): Just as there is no morphological reason to assume that *Glaube* contains the verb *glauben*, there is no morphological reason to assume that *Wildnis* ('wilderness') contains the adjective *wild* as opposed to the Root $\sqrt{\text{WILD}}$. Rather, what these examples serve to show is that it is not possible to claim that the nominalizer *-nis* attaches

only to verbal bases. Should we conclude that, unlike in the case of *-ung*, a Root-nominalization analysis of *-nis*-nouns is to be preferred? This question leads us to a final consideration that has been used as an argument that a given nominalization must be deverbal: the availability of a CEN reading, as discussed in chapter 3 (cf. Borer 2014; Wood 2023).

This last kind of argument is more theory-internal than the others, and faces an obvious challenge from the existence of the SENs like *event* or *trip*, which have an event reading but are not deverbal (cf. section 3.4). But if we assume for the moment that we can reliably distinguish the CEN reading from an SEN reading in German, the availability of an event reading with some (though certainly not all or even most) *-nis*-nominalizations may point to the presence of *v* at least in those cases.

- (189) Sein Ge-ständ-nis der Tat dauerte zwanzig Minuten
 his GE-stand-NMLZ the.GEN crime took twenty minutes
 'His confession of crime took twenty minutes.'

To summarize, we have seen that it is not trivial to determine whether a given form is deverbal in the narrow sense in a theory with category-neutral Roots. We have also seen that it is even harder to make a claim about the attachment height of prefixes in such a structure. Because the categorizers are suffixes, the linear order of morphemes provides no clues. Thus, in order to investigate the internal structure of prefixed nominalizations, we need to rely on arguments from selection, as was sketched above, and from interpretation, as has been the focus in this thesis. I will argue that this latter kind of argument is not as simple as has sometimes been presupposed in the literature. In particular, it is not necessarily true that the nominalization of a prefixed or particle verb *must contain that verb*. This will be discussed in section 5.3.2 (and throughout). Instead, the availability of nominalizations from particular verbs indicates that locality conditions on alloosemy govern where the preverbal elements can be interpreted, and where they cannot.

5.1.1 EXCURSUS: EXPONENTS AND GENDER

The majority of this chapter is concerned with the syntax and interpretation of prefixed nominalizations in German, but one further note about their morpho-syntax is also necessary. A particular point of interest in the morpho-syntax of nominalizations in German generally is gender. German nouns in general are feminine, masculine, or neuter. For the most part, gender is morphologically unmarked on the noun and unpredictable. In nominalizations, however, gender is sometimes predictable. Several nominalizers have the property of fixing the gender of the entire class of nouns that they appear in. For example, nouns with the deadjectival nominalizer *-tum* are always neuter, nouns with the deadjectival nominalizers *-heit* and *-keit* are always feminine, as are nominalizations with one of the nominalizers of interest in this thesis, deverbal nominalizer *-ung*. This could suggest, in line with other work, that gender features are located on *n* (cf. Kramer 2016), such that different exponents of *n* can be seen as spelling out different gender features. Less straightforward, under this assumption, is the fact that *-nis* nouns can be feminine or neuter (cf. *die Erkenntnis* ('revelation'), *das Ergebnis* ('result')), but not masculine. $-\emptyset$ nouns can be any gender (*der Glaube*⁶⁰ ('belief'), *die Annahme* ('assumption'), *das Geschenk* ('present')). Whether gender is a property of *n* or not is highly relevant to the question of whether different nominalizers are (allomorphic) exponents of one head *n*, or realize syntactically distinct heads: a theory that does not assume syntactically distinct n_1 , n_2 , n_3 for the different nominalizers requires additional claims about the syntactic representation of gender in the nouns containing these nominalizers. However, the case of *-nis* calls into question whether a theory with such distinct nominalizers in the syntax really has the upper hand as regards the gender problem: Such a theory would have to stipulate two nominalizers, $n_{x,F}$ and $n_{y,N}$, both of which are realized by *-nis* and behave identically in syntax and semantics apart from their gender specification. Thus, gender in particular seems to be a promising angle on the relationship between the categorizer(s) *n* and exponents in German. I am not able to discuss this in more detail in the present context, but it is worth keeping in mind that the gender facts call into question to what extent the different nominalization structures can be analyzed as syntactically identical.

⁶⁰Whether there is a suffix $-\emptyset$ or $-e$ is hard to tell in cases like this, cf. Wiese 1996 on schwa in German.

To summarize, we have seen that the claim that particles have phrasal syntax creates an issue in the nominal domain. In the next three sections, we will look at three types of nominalizations in more detail to see how this problem manifests itself, and how we can distinguish among the three ways of getting out of the dilemma that I enumerated above. First, we will look at nominalized infinitives, where the evidence for phrasal inputs to nominalizations is strongest (though it is not without problems even in that domain, as we will see). In section 5.3, we will turn to *-ung*-nominalizations, focusing in particular on the fact that particles, but not resultatives, are possible in *-ung*-nominalization: this, I argue, provides an argument against the ‘phrasal inputs’ solution in this domain. The ‘particles-as-heads’ solution emerges as the most parsimonious approach to *-ung*-nominalization. Finally, I will contrast these results with *Ge-**-e*-nominalizations, which obey a distinct set of restrictions on preverbal elements. For *Ge-**-e*-nominalizations, the clearest account of these restrictions emerges under the ‘outer attachment’ solution to the structure problem. Thus, I conclude that the two latter types of nominalizations favor two different solutions to the particle ‘structure problem’, reinforcing the strange status of particles in the grammar.

5.2 NOMINALIZED INFINITIVES

As a basis for comparison, this section briefly introduces the nominalized infinitive. The nominalized infinitive simultaneously serves as a baseline and point of contrast: it is very widely available, clearly (and definitionally) deverbal, and typically has an eventive interpretation. It is also the best candidate for a nominalization in German that can take phrasal structures as its input, although, as we will see, there are complications to this assumption, arising from the less-than-clear dividing line between the nominalized infinitive and a similar structure that we will refer to as the ‘verbal nominal’. I will not provide a full analysis of these two structures, but they will serve to highlight some of the broader issues in the study of nominalization, especially once we compare them to *-ung* and *Ge-**-e* in the subsequent sections. To approach the nominalized infinitive, consider the examples in (190).

- (190) a. Das Brau-en neuer Biere ist mein Hobby
 the brew-INF.NMLZ new.PL.GEN beer.PL.GEN is my hobby
 ‘The brewing of new beers is my hobby’
- b. Das regelmäßige Ver-kauf-en von Gemälden sichert meinen
 the regular VER-buy-INF.NMLZ of painting.PL.DAT guarantees my
 Lebensunterhalt
 livelihood
 ‘The regular selling of paintings guarantees my livelihood.’

The nominalized infinitive is generally interpreted as an event, but it can refer to both particular events (191a) and generic events or event kinds (191b) (Ehrich 1991, and cf. Chierchia 1984).

- (191) a. das gestrige Leer-en der Mülltonne war mühsam
 the yesterday empty-INF.NMLZ the.GEN garbage.can was laborious
 ‘Yesterday’s emptying of the garbage can was hard work’
- b. das Auf-geh-en der Sonne ist (immer) ein großartiges Spektakel
 the AUF-go-INF.NMLZ the.GEN sun is always a great spectacle
 ‘The sun’s rising is always a great spectacle’

Nominalized infinitives are in some ways similar to the English ‘mixed’ nominalizations (cf. Chomsky 1970; Harley and Noyer 1998). However, nominalized infinitives in German cannot be characterized as the default realization of *n* where no other nominalization is available: The form is available for all verbs, regardless of whether or not another nominal form is also possible. Prescriptively, the nominalized infinitive is dispreferred if another noun is available, this is the case in (191b), which ‘competes’ with (192), but not (191a), where no Root nominal or other nominalization exists.

- (192) Der regelmäßige Ver-kauf von Gemälden sichert meinen Lebensunterhalt
 the regular VER-buy.NMLZ of painting.PL.DAT guarantees my livelihood
 ‘The regular sale of paintings guarantees my livelihood.’

However, speakers do not have the intuition that the nominalized infinitive is blocked for verbs with other nominalizations, such that any putative competition must be understood at the level of usage, and cannot be part of the grammar. In particular, in the terms of e.g. Embick and Marantz (2008) and Embick

et al. (2023), the happy coexistence of nominalized infinitives with other nominalizations of the same Root indicates that we are not dealing with competition for insertion.

The external, argument-taking syntax of nominalized infinitives patterns with other nouns. Within German, this means that both genitive DP arguments (191a) and PP arguments (191b) are possible (see section 3.2.1 for an overview concerning which kinds of arguments can be realized in this position). Nominalized infinitives are modified by adjectives as in (192). All nominalized infinitives have neuter gender and take the definite article *das*. It is worth pointing out that German nominalized infinitives diverge from English ‘mixed’ nominalizations in definiteness and pluralization: They allow the indefinite article *ein* in some contexts, but categorically cannot be pluralized (cf. Alexiadou et al. 2011; Iordăchioaia 2020). Whether we are dealing with word-internal category change is not an issue that arises for nominalized infinitives; they are derived from a verbal form by definition.⁶¹

Importantly for our purposes, prefixes, particles, and resultatives are all perfectly acceptable in nominalized infinitives:

- (193) a. das Ver_{pfX}-kaufen (selling)
 b. das Ein_{PRT}-führen (introducing, importing)
 c. das Wach_{RSP}-küssen (awake kissing)

From the perspective of the nominalized infinitive, then, the strategy of allowing phrasal structures to undergo nominalization seems plausible. This is initially further supported by the fact that larger phrasal modifiers can also appear with nominalized infinitives:

- (194) a. das Nicht-ver-steh-en der Anweisungen
 the not-VER-stand-INF.NMLZ the.GEN instructions
 ‘not understanding the instructions’
 b. das Durch-den-Wald-Reit-en der Armee
 the through-the-forest-ride-INF.NMLZ the.GEN army
 ‘the riding through the forest by the army’

⁶¹On the other hand, how the infinitival morphology is realized in the nominal domain is not a trivial question, it could in principle be a realization of *v* or *n*.

In general, adjectives and adverbs are harder to distinguish in German than English, but in some contexts, adjectives are inflected while adverbs are invariant, this is the method exemplified above. Crucially, however, if the dividing line between the nominalized infinitive and the verbal nominal were as clear as (195) suggests, we would expect only the inflected adjective to be available in (196).

In summary, the nominalized infinitive is uncontroversially available for verbs in German quite generally, but the exact size of the verbal structure that undergoes nominalization is difficult to ascertain. For this reason, the nominalized infinitive does not definitively rule out any of the strategies for dealing with the ‘structure problem’ for particle verbs, but it remains the most plausible case of a nominalization strategy with phrasal inputs.

5.3 *-ung* NOMINALIZATIONS

In this section, I will show that unlike the nominalized infinitive, *-ung*-nominalization has been shown to be available only for a specific (though large) set of verbs. In particular, Roßdeutscher and Kamp (2010) show that the best available generalization is that *-ung*-nominalizations can be derived from verbs with a complex event structure. As we will see, this generalization explains why prefixed verbs typically can undergo *-ung*-nominalizations (recall from chapter 4 that prefix verbs typically receive complex change-of-state interpretations). As is also emphasized by Roßdeutscher and Kamp (2010) and Pross (2019), this generalization has far-reaching implications for syntactic theories of word formation. In particular, the information that a given verb structure is semantically an appropriate input to *-ung*-nominalization must be visible to the nominalizer at some point in the derivation. I will argue that this in turn favors an approach to the ‘structure problem’ from section 5.1 that attaches particles low, because many particle verbs are possible inputs to *-ung*-nominalization (and crucially must be identifiable as such by the nominalizer).

In a second step, I will focus on a telling restriction on the generalization above: resultatives, which, according to their characterization from the previous chapter, *should* be semantically appropriate inputs to *-ung*-nominalizations by this generalization, are not generally possible (despite some claims to

that effect in the previous literature). This, I argue, means that *-ung*-nominalizations specifically favor the ‘particles-as-heads’-solution to the structure problem. If non-phrasal attachment is not possible for resultatives, the restriction follows.

5.3.1 COMPLEX EVENTS UNDER *-ung*

Nominalization with *-ung* is one of the more common patterns of nominalization in German. *-ung*-nominalizations are feminine, and often allow an event interpretation, RN interpretations, and (more rarely) content interpretations (although there are many restrictions on the readings in any given nominalization).⁶³ Many German verbs can undergo *-ung*-nominalization. I will disregard the small number of putative non-deverbal *-ung*-nouns, such as *Zeitung* (‘newspaper’) and *Böschung* (‘embankment’). Various sets of restrictions on the base verbs have been proposed, ranging from ‘not very restricted’ in Fleischer and Barz (2012: p. 225) to the frequent claim that the formation is productive with transitive verbs (see e.g. Wunderlich 1987). Roßdeutscher and Kamp (2010) show that the best generalization is in terms of event structure. In particular, what they call ‘bi-eventive’ verbs (see also Marantz 2005; Schäfer 2012) can typically undergo *-ung*-nominalization, this corresponds to complex change-of-state verbs in our terminology. The advantage of this generalization is that it straightforwardly captures the availability of the nominalization from many morphologically complex verb, as illustrated in (197).

- (197)
- a. Ein-führ-ung (‘introduction’, ein_{PRT}-führen ‘introduce’)
 - b. Ab-sperr-ung (‘closing off’, ab_{PRT}-sperr-en ‘close off’)
 - c. Aus-grab-ung (‘excavation’, aus_{PRT}-graben ‘excavate’)
 - d. Be-handl-ung (‘treatment’, be_{prfx}-handeln ‘treat’)
 - e. Ver-bind-ung (‘connection’, ver_{prfx}-bind-en ‘connect’)
 - f. Ent-tarn-ung (‘exposure’, ent_{prfx}-tarn-en ‘expose’)

As we saw in the last chapter, prefix verbs and many particle verbs have a complex event structure.

⁶³I will mostly set the readings aside here, but it will be important that both *v* and *n* can have contentful allosemes, along the lines of the analysis in chapter 3.

Roßdeutscher and Kamp's (2010) generalization is particularly successful in two respects: First, it explains why *-ung*-nominalization is frequently possible from a derived change-of-state verb, but not from the simplex activity verb, as in (198).

- (198) a. Be-arbeit-ung ('editing', cf. *Arbeit-ung)
 b. Be-schreib-ung ('description', cf. *Schreib-ung)
 c. Be-mal-ung ('painting', cf. *Mal-ung)
 d. Er-schieß-ung ('deadly shooting', cf. *Schieß-ung)
 e. Ver-zöger-ung ('delay', cf. *Zöger-ung)

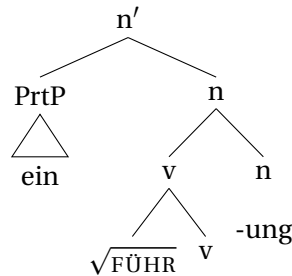
The generalization also explains why some morphologically simplex verbs, as well as some intransitive verbs, do in fact allow *-ung*-nominalization, particularly those verbs with descriptively 'deadjectival' Roots (including intransitives, contrary to the predictions of the transitivity-based generalization).

- (199) a. Klär-ung ('clarification', *klären* 'clarify', from *klar* 'clear')
 b. Trockn-ung ('drying', *trocknen* 'dry', intr.)
 c. Er-müd-ung ('tiring', *er-müden* 'grow tired', intr.)
 d. Land-ung ('landing', *landen* 'land', intr.)

Of course, it should be acknowledged that the generalization that *-ung* must attach to a verbal structure that can receive a complex change-of-state event interpretation is puzzling from a structural and derivational perspective. Importantly, as was mentioned above, these nominalizations also have non-eventive interpretations, sometimes exclusively, so it is not the case that the event interpretation necessarily survives nominalization (note that this is also an issue for analyses that implement the complex event structure syntactically). I will not give a full analysis here, for present purposes, it suffices to draw two conclusions: First, when the attachment of *n* is evaluated in these nominalizations, the evaluation must have access to the interpretation of the (complex) verb to which it is attached. Therefore, secondly, particles must be attached low in these structures, ruling out the 'outer attachment' solution to the struc-

ture problem. In that structure, the particle would be too far away to trigger allosemy on the Root, given that both v and n can receive contentful interpretations.

(200) Particle too far away



Rejecting the ‘outer attachment’-solution to the structure problem leaves us with two options: We can either claim that *-ung* can attach to phrasal structures, or we are left with the option that particles must attach as heads in nominalization structures. The first strategy would appear to be more parsimonious, and versions of it are adopted in Lüdeling (2001), Müller (2002, 2003), and Bruening (2018).⁶⁴ However, other research has argued that this strategy makes incorrect predictions regarding the attachment of *-ung* to unambiguously phrasal structures (see e.g. Stiebels and Wunderlich 1994; Zeller 2001a). For example, Zeller (2001a) contrast the particle verb nominalization *Ein-führ-ung* (‘introduction’) with the attempted nominalization of a VP with a directional PP.

- (201) a. die Ein-führ-ung
the EIN-lead-NMLZ
‘the introduction’
- b. *die In-den-Wald-Führ-ung
the into-the-forest-lead-NMLZ
‘the leading into the forest’
- c. das In-den-Wald-Führ-en (der Kinder)
the into-the-forest-lead-INF.NMLZ the.GEN children
‘the leading into the forest (of the children)’

⁶⁴Müller’s implementation differs in an important way from the other authors in this line of research: He argues that nominalization applies *before* the nominalization syntactically combines with the phrasal material (in that sense, he proposes an ‘outer attachment’-solution), but is crucially already lexically specified for the kinds of phrases that it will be allowed to combine with. In empirical prediction, Müller’s claims align with those of the proponents of the ‘phrasal inputs’-solution.

These examples show two important things: First, that *Ein-führ-ung* is the nominalization of the verb *ein-führen* (introduce), involving allosemy of the Root conditioned by the prefix. The nominalization maintains the allosemantic interpretation that the Root receives in the context of the prefix. Secondly, *-ung* cannot alternatively apply to the vP *in den Wald führen* ('lead into the forest'), while the nominalized infinitive can (201c). This seems to clearly suggest that *-ung* cannot attach to phrasal structures (this is also the conclusion drawn by Zeller). Nonetheless, it has sometimes been argued on the basis of examples as in (202) that there *are* phrasal structures in *-ung*-nominalizations (cf. Müller 2002, 2003).

- (202)
- a. Un-kennt-lich-mach-ung ('redaction', lit. unrecognizable-making)
 - b. Wieder-sicht-bar-mach-ung ('restoration', lit. again-visible-making)
 - c. Grund-stein-leg-ung ('groundbreaking ceremony', lit. foundation-stone-laying)
 - d. Neben-einander-stell-ung ('juxtaposition', lit. next-each-other-putting)

However, all of the examples above suspiciously feature light verbs *machen* ('make'), *legen*, *stellen* (both: 'put'). I do not provide an analysis of these examples here, but it seems quite plausible that the conditions on light verb nominalizations will be of a different nature. Note relatedly that these forms strongly resemble clear cases of A+N-ung compounds as in (203).

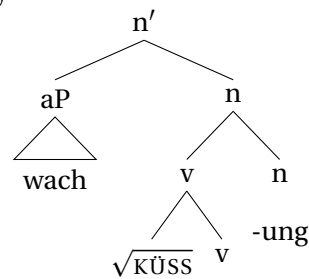
- (203)
- a. Kalt-press-ung ('cold pressing')
 - b. Blind-land-ung ('blind landing')

Contra Müller (2002, 2006) and Bruening (2018), the ban on phrasal structure in *-ung*-nominalization is also apparent in resultatives (cf. Lüdeling 2001).

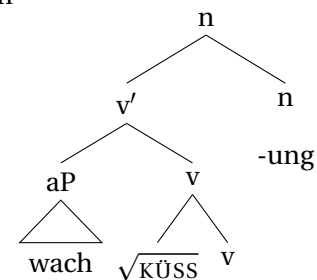
- (204)
- a. *Platt-hämmer-ung (attempted: flat hammering)
 - b. *Tot-schieß-ung (attempted: dead shooting)
 - c. *Wach-küss-ung (attempted: awake kissing)
 - d. *Rot-mal-ung (attempted: red painting)

This is of particular interest in the present context, given that, according to the findings from the previous chapter, resultatives have exactly the kind of complex event interpretation that should satisfy the attachment conditions on *-ung*. Structurally, however, resultatives are straightforwardly excluded if a) they cannot help the verb to fulfill the semantic condition through outer attachment, as we argued for particles above, and b) unlike particles, they cannot be attached non-phrasally.

(205) RSP too far away



(206) phrasal RSP not possible inside nominalization



Müller (2002, 2006) and Bruening (2018) base their claim that resultatives *are* possible in *-ung*-nominalization primarily on the example in (207).

(207) ??Leer-fisch-ung ('fishing empty')

My consultants find this example only marginally acceptable, it seems possible that it is slightly more acceptable compared to the examples in (204) in analogy to the prefix verb nominalization *Überfischung* ('overfishing').

Müller (2002) also cites *Kaputt-sanier-ung* ('renovating until broken') and *Kaputt-er-schließ-ung* ('developing until broken'), but these are excellent examples for the kind of exception that proves the rule: note that according to the discussion in the last chapter, the source resultatives for these nouns should already be ungrammatical, given that *sanieren* ('renovate') and *er-schließen* ('develop') have end states (and, in the case of *er-schließen*, a prefix). And indeed, these constructions have the distinct flavor of wordplay, because the RSP *kaputt* 'broken' provides the opposite end state specification from the one that is typical for a renovating or developing event. This is crucially not just a matter of a non-canonical

end state, but of two contradictory ones, on a par with the equally playful *Ver-schlimm-besser-ung* ('improvement that makes things worse'). These constructions characteristically *flout* grammatical principles, and thus do not make good illustrations of such principles.

To summarize, I have argued that *-ung*-nominalizations point towards the solution to the 'structure problem' that has particles attach as heads in the nominal domain, chiefly by making the other solutions prohibitively costly. The 'particles-as-heads' solution has the advantage of deriving the fact that particles, but not RSPs, can occur in *-ung*-nominalizations, and it explains how particles can be a part of the complex head in which both *v* and *n* can receive a contentful interpretation. In the next subsection, I discuss a different approach to *-ung*-nominalizations as proposed in Pross (2019), with a focus on the main assumptions behind Pross' approach.

5.3.2 AGAINST THE CONTAINMENT PRINCIPLE

Pross (2019) shares many of the goals that I am pursuing in this chapter (and in this dissertation more broadly), especially in exploring the connection between certain aspects of lexical semantics as they pertain to systematic and grammatically relevant ambiguities, and a syntactic theory of word formation. He also pursues these goals in the empirical domain of the interpretation of *-ung*-nominalizations. However, Pross makes two core assumptions that diverge from the present work in important ways.⁶⁵ The first of these assumptions is what Pross refers to as the structural disambiguation principle, according to which each distinct interpretation of a nominalization (or any other morphologically complex entity) must be represented by a distinct syntactic structure. It should be clear that this assumption simply does not hold in a theory that admits allosemy; what is more interesting is the question of whether it must hold in a theory *without* allosemy. To the extent that this is the case, it provides a promising pathway to further evaluating the prospects of positing contextual allosemy for a given alternation in meaning: if distinct syntactic structures can be motivated, the interpretative effects can be linked to them, if they cannot, allosemy has to take over. A weaker version of this general logic has been employed across the dissertation:

⁶⁵It is worth pointing out that Pross explicitly states that he is setting out to test the consequences of these assumptions, rather than that he shares them.

We have seen that allosemy is posited especially where there is evidence *against* distinct syntactic structures. The stronger version, however, appears to be too strong: It is not clear to me that Pross' conclusion that *only* structural ambiguity can cause alternations in interpretation under a syntactic theory of word formation is warranted even in a world without allosemy, given the possibility that pragmatic principles might play a role in these phenomena, and that the compositionality of lexical meaning is clearly more complex than Pross' system would suggest. In any case, given that the framework assumed and argued for in this dissertation takes allosemy to be part of the interpretative mechanism, it is clear that the structural disambiguation principle need not and cannot be assumed in this version of the theory.

The second crucial assumption in Pross (2019) is what he refers to as the containment principle. As Pross rightly observes, a version of this principle is a crucial assumption in any version of DM: embedded form means embedded structure. However, the extent to which containment can and should be applied to interpretation is a much more contentious point. Recall from chapter 2.4 that I endorsed a version of the view in Marantz (2013a) concerning the ways in which meanings come to be disambiguated according to local interpretation, a view that does rule out non-local interactions for (allosemic) interpretation, but crucially does not imply that the meaning of a derived form has to be strictly predictable from the meaning that the embedded string would have had by itself (recall the fact that the specialized meaning of *national-ize* is related to, but not predictable from *national*). The detailed and explicit formulation of Pross' approach makes this problem particularly clear: in devising an analysis that is supposed to strictly adhere to the meaning-side version of the containment principle, the principle is challenged at the very first step of building the complex syntactic structures that Pross argues are necessary to abide by the containment principle (in combination with the structural disambiguation principle). In deriving the participle *be-mal-t* (painted) from the noun *Mal* (spot, mark), Pross explicitly predicts that the meaning of *bemalt* is '[...] *x* 'has' the property of 'being marked'.' (Pross 2019: p. 241). The problem, curiously not discussed by Pross, is that this is not the right lexical semantics for *bemalt* on even the most intuitive of levels: *bemalt* means 'painted', not 'marked'. The meaning-side containment principle thus fails before Pross gets to the stage of his derivation that involves nominalization.⁶⁶ We should conclude,

⁶⁶In the next step of the derivation, the principle arguably also fails on the form side. In deriving the nominalizations from

then, that the strong version of the ‘containment principle’ cannot hold, and should not be applied in the evaluation of syntactic theories of word formation. The reason that *-ung*-nominalizations make a particularly fascinating contribution to this debate is that they show two things simultaneously: on the one hand, strict ‘containment’ does not hold, on the other, the semantic interpretation of the base as a change-of-state event is a crucial factor in determining whether *-ung*-nominalization is available.

I have argued here that the resultative data refine this latter point, by showing that *-ung*-nominalizations are additionally subject to a structural locality restriction that prohibits resultatives from being *-ung*-nominalized due to their phrasal status, contrary to prominent claims in the literature (Müller 2002; Bruening 2018). I argued that the ban on resultatives points to a resolution of the structural paradox for particles that involves their attachment outside of the nominalizer. This solution is not without problems, and thus deserves further investigation. In the next section, I show that further evidence for this analysis comes from a kind of nominalization that does allow (some) resultatives, but curiously no inseparable prefixes: *Ge- -e* nominalization.

5.4 *Ge- -e* NOMINALIZATIONS

In this section, I will discuss some of the properties of *Ge- -e* nominalization. In particular, I will question the received wisdom that prefixed verbs cannot be *Ge- -e*-nominalized for phonological reasons, and instead relate this restriction to the fact that prefixed verbs require obligatory internal arguments, while *Ge- -e* nominalizations are eventive nominalizations that do not allow the realization of an internal argument – a property that is interesting in its own right, given our discussion of event nominalizations up to this point.

Ge- -e nominalizations have received less attention than nominalized infinitives and *-ung*-nominalizations in the theoretical literature, but are frequently singled out in descriptions of German morphology for a strictly form-related reason: on the view that *Ge- -e* is a bipartite, discontinuous nominalizing

adjectival participles, rather than verbs, Pross predicts that the participial ending *-t* should survive in the nominalization, producing **Bemaltung*. Pross partially addresses this by positing a zero elsewhere allomorph for the participial feature [+part], but the more specific context [+a] (adjectival) is crucially present in nominalizations on his analysis, and thus should trigger the *-t* allomorph.

morpheme (more on this view and alternatives below), it is the only nominalizer in German to involve prefixation, and one of only two potential circumfixes in the language (the other is participial *ge- -t/-en*). Some initial examples are provided in (208).

- (208)
- a. das Ge-sing-e ('singing')
 - b. das Ge-klopf-e ('knocking')
 - c. das Ge-frag-e ('questioning')
 - d. das Ge-lach-e ('laughing')
 - e. das Ge-schnarch-e ('snoring')
 - f. das Ge-hops-e ('hopping')
 - g. das Ge-tanz-e ('dancing')
 - h. das Ge-knutsch-e ('smooching')
 - i. das Ge-pfusch-e ('bungling')

As these examples suggest, all *Ge- -e* nominalizations have neuter gender, like nominalized infinitives. The formation is particularly common with verbs denoting perceptible action, such as verbs involving sound emission (208a-e), agentive motion (208f,g), or other perceived and evaluated actions, (208h,i). Like nominalized infinitives, *Ge- -e* nominalizations cannot be pluralized; this is tied to the interpretation of *Ge- -e* nouns, which is typically described as eventive, with the event either iterated or of persistent duration. Where the semantics are relevant below, I will sometimes indicate this in the English translations with 'the constant/repeated singing' etc.. Note that much as I mentioned in section 5.2 for nominalized infinitives, pluralization of these forms is *irredeemable*, potentially contrasting with English mixed nominalizations.

- (209)
- a. *die ständigen Ge-sing-e
the.PL constant.PL GE-sing-NMLZ
intended: 'the multiple instances of constant/repeated singing'
 - b. *die ständigen Ge-knutsch-e
the.PL constant.PL GE-smooch-NMLZ
intended: 'the multiple instances of constant/repeated smooching'

According to Fleischer and Barz (2012), *Ge-* *-e* nominals are fairly freely available with transitive and intransitive verbs, including newer loans from English such as *Ge-mail-e* ('emailing') or *Ge-surf-e* ('surfing'). There are, however, semantic, morphological, and, for some speakers, phonological restrictions, which I will return to in more detail shortly.

Before we turn to the restrictions, two notes on the delimitation of the phenomenon are in order. First, note that the final schwa vowel is optionally deleted in some forms in this nominalization pattern, especially after *r* and *l*.

- (210)
- a. das Ge-jammer-(e) ('whining')
 - b. das Ge-heul-(e) ('crying')
 - c. das Ge-alber-(e) ('fooling around')
 - d. das Ge-klimper-(e) ('jingling')
 - e. das Ge-zappel-(e) ('wriggling')

Although the distribution of schwa in German is notoriously complex, and the generalization is consequently not perfect, I will assume that schwa is underlyingly present in all *Ge-* *-e* nominalizations and optionally deleted after liquids (cf. Plank 1986; Olsen 1991; Wiese 1996).⁶⁷ Nouns as in (210) will thus be assumed to include this nominalizer even when schwa is missing. There is, however, also a class of *Ge*-nouns that should not be included, even though their formation appears to be historically related (cf. Olsen 1991). This second class contains nouns with the prefix *Ge-* that do not have the iterative/persistent interpretation and do allow pluralization. Note incidentally that most but not all of these nouns have neuter gender (cf. Plank 1986), suggesting that we are justified in setting them aside.

- (211)
- a. das Gewitter ('thunderstorm', pl.: die Gewitter)
 - b. das Gebäck ('baked good', pl.: die Gebäcke)
 - c. das Gebäude ('building', pl.: die Gebäude)
 - d. der Gesang ('singing', pl.: die Gesänge)

⁶⁷As a matter of fact, these authors typically assume that deletion is allowed anywhere but following voiced obstruents, but this is to derive a larger set of *Ge*-nouns than is under investigation here, see below for the set of crucially excluded nouns.

In some cases, these nouns exist side-by-side with *Ge-* *-e*-nominalizations from the same Root, e.g. *das Ge-back-e* ('the constant baking') (Olsen 1991), further supporting the contention that the *Ge-* *-e*-nominalization is both morpho-syntactically and semantically distinct.

Interestingly, *Ge-* *-e*-nominalizations are available fairly regularly with particle verbs and resultatives, but are completely impossible with prefixed verbs. In this sense, as alluded to in section 5.3, they are the mirror image of *-ung*-nominalizations with respect to the patterning of particle verbs: There, they patterned with prefix verbs as possible bases for *-ung*, here, they pattern with resultatives as possible bases for *Ge-* *-e*. I suggest that the pattern in *Ge-* *-e*-nominalizations supports a different solution to the 'structure problem' from what we saw for *-ung* in section 5.3. In particular, *Ge-* *-e*-nominalization support the outer attachment of particles in the nominal domain.

To make this point, I will first show that at least some particle verbs and resultatives can form *Ge-* *-e* nominalizations, but must attach outside of the *Ge-* prefix. I will then address to what extent the placement of *Ge-* and its complementary distribution with verbal prefixes can be characterized prosodically. Crucially, I will argue that at least for some speakers, the ban on prefixed verbs in *Ge-* *-e*-nominalizations cannot be purely phonological, and instead must be related to the morpho-syntax and argument structure of prefix verbs.

To begin with particles, (212) shows some *Ge-* *-e* nominalizations with particle verb, note that these show the order PRT-GE-Verb-e.

- (212)
- a. *das Herum-ge-renn-e* ('running around aimlessly')
 - b. *das Um-ge-renn-e* ('running over')
 - c. *das An-ge-brüll-e* ('shouting at')
 - d. *das Aus-ge-kotz-e* ('complaining', lit: out-vomiting)
 - e. *das Vor-ge-sag-e* ('whispering answers')
 - f. *das Bei-ge-tret-e* ('joining')
 - g. *das An-ge-schieß-e* ('shooting at')

It is worth pointing out immediately that some such nominalizations are not perfectly acceptable out of

the blue, see (213).

- (213) a. ?das An-ge-fang-e ('starting')
 b. ?das Auf-ge-hör-e ('stopping')

One might imagine different reasons for this reduced acceptability, such as the non-transparent interpretation of these examples (this is suggested in Lüdeling 2001), or a more general semantic incompatibility of verbs with a punctual meaning with *Ge- -e* (as is suggested in e.g. Kurth 1953; Olsen 1991). However, it should be noted that they improve given a context that make iteration plausible, cf. the attested example in (214) in the context of a forum discussion about people who quit smoking.⁶⁸

- (214) Nur dieses halbherzige auf-ge-hör-e alle 2 Monate von einigen Leuten nervt
 only this half-hearted AUF-GE-listen-NMLZ every two months by some people annoys
 'Only this half-hearted quitting every other month by some people is annoying'⁶⁹

The same is true more generally of punctual verbs, regardless of whether they are particle verbs; for instance, Kurth (1953) and Olsen (1991) judge *Ge-sterb-e* ('dying') as ungrammatical, but dying repeatedly is highly plausible (and *Ge-sterb-e* widely attested) in the context of discussions about video game deaths.

- (215) Ich hab keine Lust mehr auf das Ge-sterb-e in der Kanalisation
 I have no enjoyment anymore on the GE-die-NMLZ in the sewers
 'I'm sick of constantly dying in the sewers'⁷⁰

Interestingly, many resultatives are also possible in *Ge- -e*-nominalizations, in contrast to what we saw

⁶⁸In this section, I will rely more heavily on attested examples than anywhere else in this dissertation. The reason is twofold: First, judgments concerning the acceptability of *Ge- -e*-nominalization are subject to a greater degree of disagreement between speakers than other judgments in derivational morphology. I appear to be a liberal speaker. Secondly, and relatedly, *Ge- -e*-nominalizations are stylistically marked, and perceived by speakers to belong to an informal register, dispreferred in writing, and potentially subject to regional variation. All attested examples that are cited here were judged grammatical by me and varying subsets of eight other native speakers.

⁶⁹<https://planetquake.eu/viewtopic.php?t=275476/&start=30>, accessed May 9, 2025

⁷⁰This example was constructed based on a youtube video entitled 'Let's Play Together - Diablo 2 - Part #22 [Deutsch/German]: Gesterbe in der Kanalisation'.

for *-ung*-nominalizations in section 5.3. However, this appears to apply only to a subset of resultatives, specifically ones that are not added to obligatorily transitive base verbs. Recall from chapter 4 that resultatives have sometimes been classified with respect to the question whether the direct object is obligatorily selected by the Means predicate (the verb).

- (216)
- a. das Wach-ge-küss-e (kissing awake)
 - b. das Platt-ge-hämmer-e (hammering flat)
 - c. das Nass-ge-spuck-e (spitting wet)
 - d. das Trocken-ge-wisch-e (wiping dry)
 - e. ?das Tot-ge-schlag-e (beating dead)
 - f. ??das Müde-ge-streichl-e (stroking tired)
 - g. ??das Kaputt-ge-brech-e (breaking broken)
 - h. ??das Krumm-ge-bieg-e (bending crooked)

As we saw for particle verbs above, some of the less-than-perfect examples improve with a context that makes sense of the iterative semantics of the construction. For example, while *Tot-ge-schlag-e* (beating dead) is not acceptable out of the blue to many speakers (see e.g. Lüdeling 2001), it does improve in specific contexts, compare the following attested example from a review for a window screen:

- (217) Abends bleiben die Plagegeister [...] draußen, [...] somit hat auch das ganze
 in.the.evening stay the pests [...] outside, [...] so has also the whole
 Tot-ge-schlag-e ein Ende
 dead-GE-beat-NMLZ an end
 ‘The bugs stay outside in the evening, so the process of constantly beating them dead has come
 to an end’⁷¹

However, most of the resultatives formed with obligatorily transitive verbs do not improve, and are not attested, cf. (216f-h).

To summarize, particle verbs and a subset of resultatives are possible in *Ge-* *-e*-nominalization, but

⁷¹<https://www.amazon.fr/Freilufttraum-Moustiquaire-pour-porte-Noir/dp/B076F4WGKN?th=1>, accessed May 9

the particle/RSP must attach outside of the *Ge-* prefix. Below, I will discuss what this suggests about the structure of *Ge- -e*-nominalizations, and how this relates to the ‘structure problem’ sketched in section 5.1. First, however, we have to take a look at verbs with inseparable prefixes.

Prefixed verbs are not *Ge- -e*-nominalizable, cf. (218), regardless of the relative ordering of the verbal prefix and *Ge-*.

- (218) a. **Ge-be-such-e*, **Be-ge-such-e* (intended: visiting)
 b. **Ge-ver-lier-e*, **Ver-ge-lier-e* (intended: losing)
 c. **Ge-be-mal-e*, **Be-ge-mal-e* (intended: painting)
 d. **Ge-er-schieß-e*, **Er-ge-schieß-e* (intended: shooting)

Crucially, unlike some of the examples above with particle verbs and simplex verbs in *Ge- -e* nominalizations that are less than perfect without the appropriate context, *Ge- -e*-nominalizations of prefix verbs are strongly ungrammatical regardless of their semantic plausibility or the context.

It has been suggested in the previous literature that there is a phonological reason for this ban. Indeed, combining *Ge-* and a verbal prefix would lead to two unstressed syllables in a row at the beginning of the word. Furthermore, it is well-established that participles in German, which generally also have a *ge-* prefix, are formed without that prefix in already-prefixed verbs.

- (219) a. *ge-mal-t* (painted, from ‘malen’)
 b. *be-mal-t*, **ge-be-mal-t* (painted, from ‘be-malen’)

This is generally agreed to be part of a broader prosodic restriction on the prefixation of participial *ge-* (Wiese 1996). Crucially, non-prefixed verbs with non-initial stress are rare in German, but they do exist, and they consistently form participles without *ge-*.

- (220) a. *trompete-t*, **ge-trompete-t* (trumpeted, from ‘trompétén’)
 b. *telefon-ier-t*, **ge-telefon-ier-t* (talked to on the phone, from ‘telefoníeren’)
 c. *spaz-ier-t*, **ge-spaz-ier-t* (strolled, from ‘spazíeren’)

- d. diskutier-t, *ge-diskut-ier-t (discussed, from 'diskutiéren')

In analogy to this pattern, a phonological account of the unavailability of *Ge-* *-e* nouns with prefixed verbs is suggested in Stiebels and Wunderlich (1994) (also cf. Wiese 1996: p.97), who argue that these structures feature nominalization by *-e*, followed by prosodic prefixation of *Ge-*.⁷² But there are two problems with this account: First, it might predict that all prefix verbs have *-e*-nominalizations, without the prefix, parallel to participle formation. Crucially, forming the participle is not impossible in the absence of *ge-*, it just does not have the prefix, as illustrated in (220). This prediction is not borne out: *Ge-*-*e*-nominalizations of not formed without *Ge-*, they aren't formed at all.

- (221) a. *das Be-such-e (intended: visiting)
 b. *das Ver-lier-e (intended: losing)
 c. *das Be-mal-e (intended: painting)
 d. *das Er-schieß-e (intended: shooting)

Secondly, for at least some speakers, some of the verbs in (220) can form a *Ge-* *-e*-nominalization. There is variation in this respect, but at least for the speakers who allow the forms in (222) or some subset thereof, the claim that the prosodic condition on nominalization-forming *Ge-* and participle-forming *ge-* are identical cannot be correct.

- (222) a. das Ge-telefonier-e (making calls)
 b. das Ge-diskutier-e (discussing)
 c. ?das Ge-trompet-e (trumpeting)
 d. ??das Ge-spazier-e (strolling)⁷³

Note furthermore that this behavior is in contrast to Root nominalizations, which show that some pre-

⁷²For particle verbs, this is turn followed by compounding with the particle on this account.

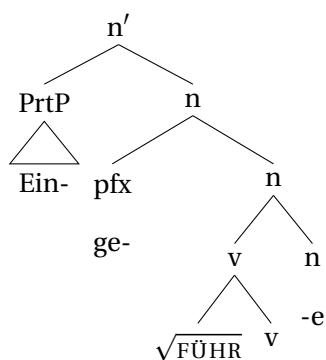
⁷³*Ge-spazier-e* was judged as markedly worse than any of the other nominalizations in this class by seven out of the eight speakers I consulted. Stefanie Müller (p.c.) points out that for many speakers, the verb *spazieren* ('walk, stroll') has been replaced by *spazieren gehen* (~ 'go for a walk') or variants thereof. I suspect that this is at least a contributing factor.

fixes can receive stress in the nominal domain, cf. *Über-nahme* ('takeover', cf. *über-nehmen*). The prosodic analysis would seem to suggest that at least these prefixes should be possible with *Ge- -e*, but they are not: **Über-ge-nehm-e*, **Ge-über-nehm-e*.

I propose that the real reason for the unavailability of *Ge- -e* with prefix verbs lies in the conflicting argument-structural requirements of the structures. As we have seen throughout, prefixed verbs demand an internal argument in the verbal domain and under eventive interpretations of nominalizations. *Ge- -e*-nominalizations are eventive, but do not allow the realization of an internal argument. The penultimate piece of the puzzle is that prefixes cannot attach outside of the nominalization. Note that if this explanation is on the right track, it provides new evidence for the idea that these prefixes are truly *verbal* prefixes, along the lines discussed in section 5.1.

Finally, if this analysis is to distinguish prefixes from particles, it must be the case that particles *can* attach outside of the nominalizer, this is sketched in (223).

(223) *Ge- -e*-nominalization structure



Given our earlier remarks in the context of *-ung*-nominalizations, it is important to stress that this analysis is only possible if the locality conditions on allosemy fall out differently in *Ge- -e* nominalizations than in *-ung*-nominalizations. I tentatively suggest that this is plausible: As briefly mentioned above, for *-ung*, contentful allosemes of *n* and *v* must be employed – this is to derive CEN, RN, and CCN interpretations. For *Ge- -e*, on the other hand, no RN interpretations are available, suggesting that *n* is semantically vacuous. This in turn extends the locality domain, allowing the particle to influence allosemy on the

Root.

Note incidentally that on this account *Ge-* *-e* emerges as a better candidate for a true German circumfix than participle-forming *ge-* *-t/-en*, because the distribution of the prefixal component *Ge-* is not due to prosodic factors alone, even for the prosodically stricter speakers: Instead, it must be prefixed immediately when the suffixal nominalizer is added to the structure.

A potential issue with this approach arises in the context of *Ge-* *-e*-nominalizations from particle verbs with non-existent base verbs (cf. section 4.3.1.1). For example, the deadjectival verb *ab-mager-n* ('lose weight'), has the nominalization *Ab-ge-mager-e* ('losing weight') as in (224), in spite of the fact that there is no verb **magern*.

- (224) Das Ab-ge-mager-e in den sozialen Medien halte ich nicht mehr aus
 the AB-ge-skinny-NMLZ in the social media hold I not anymore AUS
 'I can't stand the constant displays of weight loss on social media anymore'

This is a challenge for the claim that particles attach outside of the nominalizer in *Ge-* *-e*-nominalizations, because that analysis implies that the particle attaches outside of **Ge-mager-e*, which is not a possible nominalization on its own (this latter fact is unsurprising, given that the verb on which this nominalization is based does not exist). It seems unsatisfying to claim that the nominalization is also licensed in the context of the particle (as we had claimed for the verb in section 4.3.1). I leave this question to future research.

We have seen that a crucial restriction on *Ge-* *-e*-nominalizations relates to the obligatoriness of internal arguments with prefix verbs under eventive readings. A related claim from the previous literature that deserves further scrutiny in future work concerns inherently reflexive verbs. Both the theoretical literature (e.g. Kurth 1953; Olsen 1991) and the descriptively oriented overview in Fleischer and Barz (2012) claim that inherently reflexive verbs are categorically impossible bases for *Ge-* *-e*-nominalizations. This would fit well with our observations above, given that the reflexive pronoun may count as an obligatory internal argument in German. However, I suspect that this generalization does not hold for all speakers, based on my own judgments and attested examples such as (225).

- (225) a. [...] aber es ist immer ein ewiges ge-schäm-e und langes überreden an der
 [...] but it is always an eternal GE-shame-NMLZ and long persuade.INF.NMLZ at the
 Kiga Tür
 kindergarten door
 'but it's always a long process of feeling ashamed and persuasion at the kindergarten door'⁷⁴
- b. ok genug scheinheiliges ge-schäm-e wie aus meinen beiträgen unschwer
 ok enough hypocritical GE-shame-NMLZ as from my posts easily
 hervorgeht bin ich bayernfan
 emerges am I Bayern.fan
 'Ok, enough with the insincere feelings of shame, as is easily deduced from my posts, I am
 an FC Bayern München fan'⁷⁵

In sum, *Ge-* *-e*-nominalizations have multiple properties that are of interest in the context of this debate. They have an unusual (for German) morphological makeup, regardless of whether the nominalizer is treated as a true circumfix. They have a highly consistent interpretation as repeated or enduring events, and they have strong morpho-syntactic restrictions, such as disallowing pluralization and internal arguments. With respect to the 'structure problem' for particle verbs, they suggest a different treatment than what we saw for *-ung*-nominalization. There, we suggested that particle verbs pattern with prefix verbs in typically allowing *-ung*-nominalization, if they have a change-of-state interpretation compatible with this nominalization pattern, while resultatives are generally excluded, in spite of showing the same kind of interpretation. In *Ge-* *-e*-nominalizations, on the other hand, particle verbs are generally available, as are resultatives with non-obligatorily transitive verbs, while prefixed verbs and resultatives with obligatorily transitive verbs are excluded from *Ge-* *-e*-nominalization. This latter pattern, we suggested, can be made sense of if we assume that particles and resultatives stay phrasal in the nominal domain, and attach outside of the *Ge-* *-e*-nominalizer.

⁷⁴<https://www.urbia.de/forum/3-kleinkind/5259676-vom-engelchen-zum-teufelchen-achtung-lang>, accessed May 9, 2025

⁷⁵<https://www.fanlager.de/threads/ups.8895/>, accessed May 9, 2025

5.5 CONSTRAINTS ON MULTIPLE DERIVATION

In this final section, I briefly reflect on some of the constraints on multiple derivation that we have seen in this chapter and in the dissertation more broadly. We observed in the introduction that syntactic theories of word formation overgenerate possible combinations of affixes. In fact, this property is also shared by many non-syntactic generative theories. For English, the problem that morphological theories overgenerate in comparison to existing affix combinations is elaborated in Fabb (1988). Engaging in particular with the prominent level-ordering theory based on Siegel (1974), Fabb argues that the restriction that all ‘level 2’ suffixes have to follow all ‘level 1’ suffixes rules out only a small number of the unattested suffix combinations in English. He goes on to propose that a large class of suffixes, such as *-ate*, *-ful*, *-ive*, *-ish*, *-ment*, are themselves equipped with a selectional restriction that prevents them from attaching to any already-suffixed word. In the case of suffixes that attach only after one specific other suffix, such as *-ary* or *-ic*, Fabb proposes that the two suffixes form a compound prior to attaching to the Root. Finally, some Latinate suffixes are specified to attach only to other Latinate suffixes or a diacritically marked subset thereof (*-ion*, *-ize*, etc.).

For German, Aronoff and Fuhrhop (2002) find that there are fewer and less idiosyncratic seeming restrictions on the combinability of derivational suffixes. Nonetheless, they find many unexpectedly unavailable combinations, three examples are given here:

1. **Prüf-ling-in* (‘female examinee’), where *-ling* marks the patient of an event and *-in* forms feminine personal nouns
2. **Neid-isch-heit* (‘jealousness’), where the denominal adjective *neid-isch* (‘jealous’) fails to be nominalized
3. ?*schön-heit-lich* (‘related to beauty’),⁷⁶ where the deadjectival noun *Schön-heit* (‘beauty’) undergoes adjectivization

⁷⁶This is given a * in Aronoff and Fuhrhop (2002), speakers that I have consulted report that while it is not acceptable under the same reading as the embedded adjective *schön* (beautiful), it is fine under a more abstract reading as indicated above.

Aronoff and Fuhrhop (2002) connect the greater regularity of German affixation to the fact that German morphology has to contend with a lesser degree of grammatical influence from the Latinate vs. Germanic split that seems to complicate matters in English. Their generalization for German is that some suffixes appear to close off the word to further derivation. Notably, this type of restriction works in the opposite way from Fabb's (1988) selectional restrictions: It restricts potential *bases* of further suffixation. What Fabb's and Aronoff & Fuhrhop's work have in common (beyond the empirical focus) is that neither make a claim of explaining the restrictions on suffix combinations. Both papers assume that some combinations are ruled out by some form of *blocking*, but blocking is difficult to establish for derivational morphology in particular. As outlined in Embick et al. (2023), blocking approaches to derivational morphology rely on the notion that a hypothetical form is blocked by an existing one because the relevant slot in the meaning space is already 'taken'. In Aronoff (1976), for instance, derivatives of the same Root are in competition for a paradigm slot in a way that allows e.g. *glory* to block **gloriosity* by existing as a listed word. Kiparsky (1983) implements an ever broader notion of meaning-based competition with the AVOID SYNONYMY principle, which blocks synonymous formations even when they are not derived from the same Root (such that *thief* blocks **stealer*). In both approaches, it is far from obvious how the notion of 'meaning the same thing' works to restrict word formation in detail, in particular in the face of pairs such as *propos-al* and *propos-ition* which arguably occupy different but overlapping parts of the meaning space (cf. Halle 1973). These difficulties notwithstanding, the idea that e.g. **Neid-isch-heit* above could be blocked by *Neid* because it would 'mean the same thing' retains intuitive appeal. As Embick and Marantz (2008) show, the architecture of DM has no trouble preventing the generation of e.g. **gloriosity*. But the question that the line of work on multiple affixation from Fabb (1988) to Aronoff and Fuhrhop (2002) raises is an important one, and not one that is readily answered in DM: Why would it be the case (especially in a syntactic theory of word formation) that multiple affixation is restricted, or, as Aronoff and Fuhrhop (2002: p.488) put it, non-recursive? They write: '*And this non- recursivity is caused by closing suffixes, because in a suffix row there will be at one point a closing suffix and this is the end of the suffix row.*' This is hardly explanatory, but neither would be the corresponding DM stipulations that a particular affix is never selected for by any other affixes, or is absent from the rule application context

of any other vocabulary item. Put simply, if syntax builds words, why does it stop so soon?

Consider in the light of this question the variety of reasons that have ruled out particular instances of derivation in this chapter and over the course of the thesis. Resultatives were argued to be impossible in *-ung*-nominalization because they are phrasal, and as such cannot be part of the complex head structure that this nominalizer requires. A crucial part of this argument was that attaching them outside of the nominalizer would make it impossible to interpret the complex predicate. Prefixes were ruled out in *Ge-**-e*-nominalizations due to conflicting argument-structural requirements. Combinations of more than prefix were ruled out in chapter 4 due to a ban on multiple end states in a single complex event. What these cases have in common is that the syntax needs to provide a particular configuration such that all of the morphemes can be interpreted in the relevant locality domain. Where this is not possible, due to independent structural factors or semantic incompatibility, the word cannot be built. From this perspective, understanding the principles of alloosemy is just as important as understanding morphophonology in determining why certain combinations of affixes and Roots do not occur. This dissertation represents a step in that direction, but much more work remains to be done.

6

CONCLUSION

6.1 FINDINGS	185
6.2 THEMES AND DIRECTIONS	187

In these final pages, I briefly summarize some of the main findings from the dissertation, and sketch how the main themes relate to directions for future research.

6.1 FINDINGS

This dissertation examined a range of phenomena in German derivational morphology through the lens of allosemy. I focused on the question of how the morpho-syntactic structure and semantic interpretation of nominalizations and verbs with preverbal elements (prefixes, particles, and resultatives) relate to one another.

In Chapter 2, I surveyed some of the previous work on allosemy, and sketched some questions of special interest for the dissertation and future work on allosemy more generally. I focused on asymmetries

and similarities in the ways that Roots and functional heads are discussed in this literature, especially with respect to variable and default interpretations. Another point of focus was the validity of the ‘allomorphy analogy’, which explains the existence and the properties of allosemy in analogy to the better understood set of phenomena at PF. In that comparison, I pointed in particular to the importance of distinguishing instances of allosemy that bring about *general* alternations in interpretation, and those that derive special meanings. Finally, I also stressed the importance of continuing investigations into the locality of allosemy, on which I say a little bit more below.

In Chapter 3, I argued that the ‘content’ interpretation presents a challenge to theories of polysemy in nominalization that rely on CEN readings being available in a structure that is deverbal, and all other readings being associated with a structure that is not technically deverbal (in that it does not include *v* or its projections). In contrast, the content reading fits well into a theory that derives the polysemy through allosemy of *v* and *n*.

In Chapter 4, I turned to what is perhaps the most inescapable instance of contextual interpretation in German: the interpretation of preverbal elements and the verbal Roots with which they combine. In this chapter, I put forth a broader comparison between prefixes, particles, and resultatives, and argued that the co-occurrence restrictions between these elements follow from independently motivated syntactic and semantic factors, but defy a unified analysis. In addition, I argued that the way that these elements are interpreted presents us with a nuanced view of locality in allosemic interpretation: On the one hand, their event and argument structure can be determined only at the level of the complex predicate. On the other hand, the interpretation of the Root (and the preverbal element) must be determined locally.

In Chapter 5, I pointed to a tension created by the previous two chapters: if particles must be phrasal, why can they appear in certain ‘small’ syntactic structures, such as nominalizations? By comparing the nominalized infinitive, *-ung*-nominalizations, and *Ge-* *-e*-nominalizations, I showed that the empirical picture is much more complex than this initial formulation of the question suggests, and may in fact favor different solutions to the particle ‘structure problem’ in different nominalization contexts.

6.2 THEMES AND DIRECTIONS

In this final section of the dissertation, I draw out three themes that run through the work presented here, and how they may bear on future research.

6.2.1 THEME 1: THE SEPARATION OF SYNTAX AND SEMANTICS

At times, syntacticians will object to the kind of project undertaken in this dissertation on the grounds that the meaning of words and their component parts should not matter for syntactic theory. This kind of researcher (who shall remain an anonymous straw man in the present context) believes that the different readings of nominalizations, the change-of-state interpretation of prefixed verbs, and the availability of a given nominalization on the basis of aspectual properties of the verb do not constitute genuinely syntactic research questions, and that their treatment in terms of allosemy represents a kind of ‘semantification’ of syntactic theory. As I hope has been clear throughout the document (but nonetheless should be reiterated), I would argue that the opposite is true. The adoption of allosemy is fundamentally a hypothesis about the autonomy of syntax. In some cases, it allows us to argue that syntactic structures that were previously argued to be distinct on the basis of interpretative differences are in fact the same (this is what I argued in chapter 3, following in particular Wood (2023)). In other cases, it allows us to argue that the syntactic evidence does not support a single underlying structure for elements that had been analyzed as structurally identical due to their interpretation (this is what I argued in chapter 4). In still other cases, it may give us a new lens on how we use interpretative properties in researching the structure of words in the first place (this is what I argued in chapter 5).

6.2.2 THEME 2: LOCALITY IN ALLOSEMY

As briefly mentioned above, particularly interesting considerations arose with respect to the locality of allosemy. Two domains that shed light on this question are the interaction of preverbal elements with the verbal Root, and the effects in multiply derived, i.e. recategorized, forms. Because research into this particular question is only now beginning in earnest, I refrained from making sweeping statements

about the exact size of the relevant domains. What does seem clear, however, is that the interpretation of the Root in the context of the first categorizer is deeply important, as was already recognized in Marantz 2001; Arad 2003. At the same time, it must also be true that interpretative properties can interact beyond this most narrow domain, otherwise, none of the facts about polysemous elements in this dissertation could possibly be explained. In this, although the exact hypotheses and predictions remain to be made precise, the theory takes a stand that departs from ‘containment’, i.e. the idea that all interpretations of a complex form must derive strictly from the interpretation of embedded forms.

6.2.3 THEME 3: REGULARITY IN DERIVATIONAL MORPHOLOGY

Finally, a word on regularity in derivational morphology. Throughout this thesis, I insisted that regularities must be taken seriously, even where they have limits. Generalizations in derivational morphology are rarely exceptionless. Some of them cover only a small number of structures (for example, one interpretation of one prefix), some are restrained by their interactions with other components of the grammar. What I highlighted here is that idiosyncrasies are sometimes their own form of regularity. A theory that expects ‘unexpected’ forms and interpretations in some places, but not others, is to be preferred over a theory that simply claims that the irregular is outside of its jurisdiction. If there were no principles governing word formation, we would expect to see words of arbitrary complexity, with arbitrary degrees of relatedness in form and meaning.

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