THE SEMANTIC BASIS FOR SELECTIONAL RESTRICTIONS

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Abstract

In this thesis I investigate the relationship between the semantics of a verb and its selectional restrictions, which determine how many and what kind of arguments it must occur with in a clause. For most verbs, these restrictions are predictable from the semantics of the verb, but there are pairs of verbs with very similar semantics that differ in their argument restrictions. For example, both *ask* and *wonder* can take questions as their complements (*John asked/wondered what time it was*), but of the two, only *ask* can take a noun phrase complement with a question-like interpretation (*John asked/*wondered the time*). Similarly, while both *eat* and *devour* are verbs of consumption, the object can be omitted with *eat* but not *devour* (*John ate/*devoured yesterday*). Due to these and similar examples, many linguists have claimed that selectional restrictions are to some extent arbitrary and unpredictable from the semantics, and therefore must be learned as part of our knowledge of the relevant verbs. In this thesis I argue that these differences are not arbitrary; they recur across languages, and they can be predicted on the basis of lexical semantics, meaning they do not need to be learned on a word-by-word basis.

In order for selectional features to be eliminated from the grammar, and replaced with semantic generalizations, two things must be shown. First, it must be demonstrated that the elements being selected for can be defined in terms of their semantics, rather than their syntactic properties. If not, the selectional properties could not be considered to be fully predictable based on the semantics of the selecting and selected items. Second, it must be shown that the selectional restrictions of a predicate are predictable from components of

the selecting predicate's meaning. In other words, the semantics of both the selected and the selecting elements must be accounted for. I focus mainly on the semantics of selected elements in Chapter 2, and on selecting elements in Chapters 3 and 4.

Chapter 2 provides a brief review of the literature on selectional features, and argues that the elements being selected need not be defined in terms of their syntactic category and features. Instead, what are selected for are the semantic properties of the selected items. While the relationship between syntactic and semantic categories and properties is often systematic, it is not always, which can make it difficult in certain cases to determine the semantic basis for predicting what elements will be selected. Specifically, I argue that what appears to be selection for clausal categories (CPs or TPs) is in fact selection for propositional entities (including questions, assertions, facts, and so on); apparent selection for bare verb phrases (vPs) is selection for eventualities (events or states); and apparent selection for nominals (DPs) is selection for objects or things. Only properties of the nearest semantic entity (i.e., excluding elements embedded therein) can be selected for. In this way, I account for the selectional asymmetries between clausal and nominal complements noted by Bruening (2009) and Bruening et al. (2018): predicates selecting clausal complements can only select for (semantic) properties of the upper portion of the clause (in the CP domain), not for the lower portion (the vP domain), while predicates taking nominal complements can select for any properties of the nominal rather than being restricted to the upper portion. Since all syntactic properties of items are encoded as features, on a syntactic account it is expected that all features should be involved in selectional restrictions, contrary to fact; the semantic approach taken here allows for a principled explanation of what can and cannot be selected for.

In Chapters 3 and 4 I turn to the lexical semantics of selecting elements, showing that these too are involved in determining selectional restrictions. I start in Chapter 3 by looking at c-selection (i.e., syntactic selection), specifically the case of *eat* versus *devour*. As mentioned above, their selectional properties of these two verbs differ in that the complement of *eat* is

optional, while that of *devour* is obligatory, despite the two verbs having similar meanings. I show that this is due to the aspectual properties of these verbs: *devour* denotes an event where the complement necessarily undergoes a complete scalar change (i.e., it must be fully devoured by the end of the event), which means that the complement must be syntactically realized (Rappaport Hovav and Levin 2001; Rappaport Hovav 2008). *Eat*, on the other hand, does not entail a complete change of state in its complement, and so the complement is optional. I show that the correlation between scalar change entailments and obligatory argument realization holds for a wider group of verbs as well. Thus, the c-selectional properties of *eat*, *devour*, and similar verbs need not be stipulated in their lexical entries.

In Chapter 4 I turn to the selection of complements headed by a particular lexical item, as with *rely*, which requires a PP complement headed by *on*, a phenomenon commonly referred to as l-selection. I show that the sets of verbs and prepositions involved in l-selection, and the observed verb-preposition combinations, are not fully random but can instead be (partially) predicted based on the thematic properties of the items in question. Furthermore, I show that there are different kinds of l-selecting predicates, and one kind is systematically present in satellite-framed languages (like English) and absent in verb-framed languages (like French), based on the Framing Typology of Talmy (1985, 1991, 2000). I account for this difference by analyzing l-selection as an instance of complex predicate formation, and showing that a certain kind of complex predicate (exemplified by *rely on*) is possible in satellite-framed languages but not in verb-framed languages.

Thus, I show that the features that get selected for are semantic features, and that the problematic cases of *eat* versus *devour* and l-selection have semantic correlates, and need not be stipulated in the lexicon. While this leaves many instances of selectional features unaccounted for, it provides proposals for some components of lexical semantics that are relevant to selection, and demonstrates that a research program directed toward eliminating the remaining cases is plausibly viable.

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Chapter 1

Introduction

The main goal of any scientific theorizing should be to eliminate any mechanisms of the theory that are unnecessary or redundant, and to make the theory as simple and streamlined as possible. In recent syntactic research, this most often amounts to finding out which seemingly syntactic rules and properties can be attributed to phonology (mainly morphological realization and linearization), to semantics (both compositional and lexical), and to general, non-linguistic cognition. In this way, the grammar as a whole can be streamlined, as independently-necessary components of other modules are not duplicated in the syntax. In this thesis, I take this kind of approach to the notion of selection, with the goal of showing that selectional features do not need to be specified in the lexicon. I try to show the plausibility of the claim that, instead, the number and types of arguments that a predicate can appear with are entirely predictable from the meaning of the predicate itself, combined with certain general grammatical (and/or cognitive) rules and properties. In other words, selection for syntactic properties (c-selection) and particular lexical items (l-selection) do not exist; instead, all selection is semantic (s-selection) and predictable. In the remainder of this introductory chapter I discuss the motivation for this line of research, and a very brief outline of what will be discussed in each chapter.

The first question I will address is simply, why am I doing this? Why try and find principled explanations, based on the semantics of the elements in question, for facts of selection that appear syntactic and arbitrary? Selection, or the determination of how many and what kinds of arguments a predicate must appear with, is a property that seems at first glance to be obviously semantic – of course the argument structure of a predicate is determined by its meaning! – yet, there are many cases where there is no clear correlation between selectional properties and the semantics of the words involved. One frequently-cited case (see e.g. Jackendoff 2002) is the contrast between *eat* and *devour*: *eat* allows its object to be dropped, while the near-synonym *devour* does not. While they clearly do not have the exact same meaning, they are alike in most ways that are relevant to argument structure: both are verbs of consumption, specifically consumption of food through the mouth, where the external argument is the Agent doing the consuming, and the internal argument is the thing being consumed. At first glance, the only real difference in meaning has to do with the manner of consumption, where *devour* requires that the eating be particularly vigorous and voracious, while *eat* does not specify how the eating takes place. This difference has more to do with the Agent of consumption, specifically the manner in which the Agent does so, than the thing being eaten, and so there is no clear connection between this kind of meaning component and the availability of argument omission. Therefore, the usual conclusion is that the selectional difference must be stipulated in the lexical entry. And if selectional features must be stipulated for this pair (and others like it), then the logic goes that they must be available for all verbs: a theory in which *all* predicates have lexically-specified selectional features is clearly simpler than one in which they are specified *only* for those problematic cases like *eat* and *devour*.

However, in most cases a predicate's selectional properties do not need to be specified. In general, predicates denoting events, states, or properties involving only one participant will be intransitive. For predicates denoting eventualities involving more than one participant, the mapping of those participants to grammatical functions (subject, object, and oblique (PP)

positions) is largely predictable based on the roles those participants play in the event (i.e., their thematic roles), which can be organized in terms of a thematic hierarchy or something analogous (e.g., Grimshaw 1990; Jackendoff 1990; Reinhart 2002, 2010; Ramchand 2008). For example, participants acting of their own volition will be mapped to the subject position, while those affected by the action will be objects. These kinds of properties quite clearly depend on verb meaning, and the mapping from thematic roles to argument structure is usually fairly transparent, and so encoding argument structure in selectional features is generally not needed. It is only in the problematic cases that the specification is not obviously redundant.

Furthermore, as I show to varying degrees in Chapters 3 and 4, many of the problematic cases show consistent patterns from one language to another (modulo language-specific rules on the realization of arguments). For instance, I show in Chapter 3 that the translation equivalents of *eat* and *devour* in French, Dutch, and Arabic all show the same contrast as English in terms of the optionality of the object. In Chapter 4, I show (using a larger sample of 11 languages from various language families) that patterns of "l-selection" (i.e., situations where a verb requires a complement headed by a particular lexical item, as in *rely *(on)*) are largely consistent between languages, and while there are some fundamental differences in the kind of l-selection that are seen, these differences correlate with another grammatical difference between the languages, namely whether they are verb-framed or satellite-framed (in the typology of Talmy 1985, 1991, 2000). Cross-linguistic regularities like this are unexpected if selectional properties are lexically specified; they show instead that there must be something about the meanings of the elements in question that determine their distribution.

So theoreticians have a choice: assume lexical specification for selectional properties in all cases; formulate a theory of default realization, in which only exceptions require selectional features; or eliminate selectional features from the theory. The first two options easily account for all of the data, but at the expense of representational parsimony. The third makes for a more appealing theory, and provides the best explanation for the observed cross-linguistic

regularities, but leaves certain problematic data to be explained. In this thesis I defend the claim that the latter is the correct option, and that many of the problematic cases can be accounted for, meaning that any remaining data can plausibly be explained in this sort of way too.

While many researchers have tried (often successfully) to eliminate c-selection from various parts of the grammar, these attempts are usually fairly isolated. I am not aware of any previous attempt to defend the claim that *all* apparent c-selection is actually semantic.[1] The closest example I am aware of is that of Pesetsky (1982, 1991), but that focuses only on certain kinds of clausal and nominal complements and is not applicable to other cases. Furthermore, as is discussed in Chapter 2, this attempt faces various problems, both conceptually and empirically. In fact, the shortcomings Pesetsky's approach have been used by some (e.g., Odijk 1997; Bruening et al. 2018) to argue that c-selection cannot be eliminated at all. I claim that this pessimism is not warranted.

In order to argue that selection does not require syntactic features, two lines of argumentation are necessary. For one thing, it needs to be shown that the elements that get selected for are semantic, rather than syntactic, properties of the argument constituents. In other words, what appears to be selection for syntactic categories (e.g., DP, CP) and features (e.g., [±finite], [±plural]), as well as for particular lexical items (i.e., when a verb requires a complement headed by a specific word, as in *rely *(on)* and *comply *(with)*), is in fact selection for the semantic correlates of those features and lexical items. The other line of argumentation must show that these selectional properties, however they are defined, are predictable from the semantics of a word, and thus need not be lexically specified.

In this thesis I take both of these approaches. In Chapter 2 I propose a theory of phrase structure, building on various theories in the literature, in which the extended projections of clauses and nominals are divided into regions associated with certain semantic types; it is

[1] There appears to be an assumption in the framework of Cognitive Grammar that all selectional restrictions are semantic, resulting from requirements of conceptual coherence between the various elements involved (see, e.g., Langacker 2008, pp. 192–194). However, to my knowledge there has not been much thorough discussion of verbal argument structures in this regard.

these semantic types that get selected for, rather than syntactic categories per se. The regions line up with the classic phases (CP, *v*P, and DP), and define locality conditions on selection, thus accounting for selectional asymmetries between clausal and nominal complements that have been pointed out by Bruening (2009) and Bruening et al. (2018). In Chapters 3 and 4 I pursue the other line of argumentation, showing that previously-unexplained selectional properties are in fact predictable from the semantics of the selecting predicates. In Chapter 3 I show this with the afore-mentioned case of *eat* and *devour*, demonstrating that *devour* entails a complete change in the thing being consumed while *eat* does not, and that this difference is correlated with the optionality/obligatoriness of the argument in question.[2] In Chapter 4 I look at selection for particular lexical items (l-selection), in which the head of the complement is an apparently arbitrary word that does not seem to contribute its usual meaning to the sentence. For example, the verb *rely* takes a PP complement headed by *on*, even though nothing is physically or metaphorically "on" anything else in any clear sense. I show that in cases like this, both the verbs and the prepositions involved have certain predictable properties, and furthermore the combination of verb and preposition is a kind of complex predicate that is possible in certain languages (like English) but not in others (like French), a difference that correlates with the Framing Typology of Talmy (1985, 1991, 2000). Thus, while some idiosyncrasy remains in terms of what combinations of verbs and prepositions occur in l-selection, it shows semantic regularities that suggest that it should not be characterized using stipulated lexical features.

I should make it clear that the two case studies in Chapters 3 and 4 do not by any means provide semantic accounts for *all* of selection; instead, it is intended to reignite the debate around the existence and scope of c-selection and inspire the search for semantic explanations for the remaining cases. Universal claims such as the one I am making are notoriously hard to defend, and an attempt to account for every single instance of purported syntactic and

[2]The object of *devour* can be omitted in a passive construction; the claim made for these verbs applies not to morphologically marked valency-shifting operations, only to unmarked omission of arguments as in sentences such as *John ate yesterday.*

lexical selection would be a massive project. Furthermore, the lexical semantic theory on which these claims must be based is still emerging. The particular case studies examined in this thesis were chosen because they are fairly tractable given our current understanding, but even then, the semantic tools to solve the problems have largely only emerged in the last ten or so years. My hope is that the analyses proposed here, involving problems for which a semantic account was previously thought to be unavailable, provide a sort of proof-of-concept for the venture of eliminating syntactic selection: if these relatively high-profile problems can be solved semantically, then it is plausible that similar solutions can be found for the remaining problems.

I will end this introduction by noting that, while the theoretical framework used in this thesis (where such a framework is needed) is Minimalism (Chomsky 1995), this is largely a matter of convenience – this is the framework with which I am most familiar, as well as that taken by most of the work I am citing. While each framework has its own way of encoding argument structure and selectional properties, the question that I am asking is not specific to any framework, and the conclusions that I draw are intended to be applicable (modulo notational differences) to any framework. That being said, I have tried to avoid framework-specific terminology and analyses when I could, focusing more on the syntactic and semantic properties themselves, and the correlations between them, than on the way that they are represented in different theories. In this way I hope to have created something that is accessible to all syntacticians and semanticists, without sacrificing clarity and explicitness.

Chapter 2

Selection and Syntactic Structures

2.1 Introduction

The characterization of selection and its place within linguistic theory has varied greatly since its introduction to generative linguistics in Chomsky (1965). The predominant approach in recent decades has been to divide selection into three mechanisms: c(ategorial)-selection, for syntactic categories and (on some accounts) syntactic features; s(emantic)-selection, for semantic properties; and l(exical)-selection, for specific lexical items; the former two are due to Grimshaw (1979, 1981) and the latter to Pesetsky (1982, 1991). There has been much discussion of the place of these selectional mechanisms in grammatical theory. Furthermore, there have been attempts to simplify this system in various ways, for example by eliminating c-selection (e.g., Pesetsky 1982, 1991). Conversely, assumptions about the syntactic nature of selection have been used to make claims about phrase structure; for example, Bruening (2009) and Bruening et al. (2018) argue that selectional asymmetries between nominal and clausal complements support the claim that the DP Hypothesis is incorrect, and N is the head of nominal argument constituents, instead of D. In this chapter, I argue that there is no c-selection, and instead selection relies entirely on semantic, rather than syntactic, properties of the selected constituents. I propose a theory of phrase structure in which the

nominal and clausal extended projections are divided into semantic domains, which line up with the classical phases CP, *v*P (or, I argue, AspP), and DP; I also argue that selectional restrictions, as semantic properties, occur at the point of the derivation where the phase including the selecting predicate and its arguments is transferred to the interface, rather than in the narrow syntax. This allows the proposed domains to determine the locality of selection, thus providing a semantic account for the selectional asymmetries observed by Bruening et al.

This chapter is divided into two parts. The first part, consisting of Section 2.2, provides a review of key works in the development of the theory of selection that are relevant to this chapter and the thesis as a whole, specifically the introduction of subcategorization and selection in Chomsky (1965), their division into c- and s-selction in Grimshaw (1979, 1981), and the introduction of l-selection, and attempt to eliminate c-selection, in Pesetsky (1982, 1991). I then show that, while Pesetsky's proposal to eliminate c-selection using Case Theory faces problems, the facts in question are amenable to a semantic analysis (Dor 1992; Nathan 2006). In the next part of the chapter I present the theory of selection that I adopt for this thesis. I begin in Section 2.3 by motivating the need for such a theory with some data demonstrating a selectional asymmetry that calls into question mainstream theories of selection and phrase structure (Bruening 2009; Bruening et al. 2018). Next I introduce a theory of extended projections, drawing inspiration from such works as Ernst (2002), Ramchand (2008, 2018), Svenonius (2008, 2016), and Ramchand and Svenonius (2014), and from Phase Theory (Chomsky 2000, 2001, 2008), in which an extended projection may involve different semantic types at different points in the functional sequence, along with a theory of selection in terms of semantic types that explains the selectional asymmetry. Furthermore, the theory of extended projections obviates the need for c-selection to determine the sequence of heads within an extended projection. Section 2.5 provides the conclusions of this chapter and some discussion.

2.2 Background on selection

In this section I summarize the development of the notion of selection in generative linguistics. First I discuss the introduction of subcategorization and selection into the framework (Chomsky 1965). Next I summarize the proposal that complement selection is constrained by c- and s-selectional features (Grimshaw 1979, 1981), and the introduction of l-selection and reduction of c-selection to Case Theory by Pesetsky (1982, 1991). I then show arguments that the explanation of the facts in question in terms of Case is not satisfactory, but that a semantic explanation is available that eliminates the need for either arbitrary selectional or Case features in the lexical entries of the verbs in question (Dor 1992; Nathan 2006).

2.2.1 Selection in *Aspects*

In *Aspects* (Chomsky 1965), Chomsky introduces context-sensitive subcategorization features to the grammar, which determine the contexts into which a lexical entry can be inserted in a derivation. These are divided into two types: strict subcategorization features, which determine the kinds of items which must occur along with a head in its maximal projection (e.g., a verb with the feature [+__NP][1] must appear in a VP along with a single NP and nothing else); and selectional features, which specify features that must be present on the subject or object of a lexical item (e.g., a verb with the feature [+[+Abstract]__[+Animate]] must occur with an abstract noun as its subject and an animate noun as its object).

Chomsky (1965) treats these two as separate types of feature for a number of reasons. First, every verb (at least in English) must appear with a subject, while possibilities for complements vary greatly, so subcategorization rules involving syntactic categories such as NP and S′ need be specified only for the complement(s) of a verb; the requirement for subjects can be treated as a general rule of the grammar rather than as specified in lexical entries. On the other hand, in terms of features such as [±Animate] and [±Abstract], verbs impose

[1]The notation for features in Chomsky (1965) includes a plus sign in all cases, suggesting they are intended as binary features. However, it is not clear if the intent is that features such as [–__NP] or [–[+Abstract]__[+Animate]] are expected to be attested, and if so, what exactly they would mean.

restrictions on both the subject and the object, and furthermore, at least in the theoretical framework of the time, these features are found not on the argument phrases as a whole (e.g., on the entire NP or PP), but instead on the head of the argument. Thus, the selectional relation is less local than the sisterhood involved in strict subcategorization. In addition, while violating either kind of restriction leads to an ill-formed sentence, the ways in which they are ill-formed are qualitatively different, as illustrated by the examples in (1) (adapted from Chomsky 1965, pp. 148–149):

(1) a. An hour elapsed that Bill was here.

b. The boy may frighten sincerity.

In (1a), the strict subcategorizational feature of *elapse*, namely [+__#] (i.e., no complement is permitted – *elapse* is intransitive), is violated, and the result is simply ungrammatical and cannot receive any interpretation. On the other hand, in (1b), it is the selectional feature of *frighten*, namely [+[+Abstract]__[+Animate]] (i.e., it requires an abstract subject and an animate object)[2] that is violated. Sentences of this sort are clearly deviant, but one can come up with a plausible interpretation involving some sort of metaphor or personification, unlike in the former example. Thus, the two types of contextual subcategorization differ in both their structural form and in their interpretive effects.

Due to these differences, particularly the difference in interpretation, Chomsky (1965) considers the possibility that selectional features belong not in the syntactic component of the grammar, but in the semantic component. He argues that the nominal features involved, such as [±Animate] and [±Abstract], cannot themselves be eliminated from the syntax, since they affect the distribution of certain elements, such as free relative clauses, as shown in (2):[3]

[2]At least, this is the selectional frame Chomsky assigns to *frighten*. Many speakers, myself included, allow a non-abstract subject for *frighten*, thus allowing examples like *The boy may frighten me*. (See Jackendoff 1990 for discussion of the different interpretations depending on the animacy of the subject with verbs like *frighten*.) However, (1b) still violates the selectional properties of *frighten* on this reading, since an animate object is required either way.

[3]While these examples are puzzling, the solution is not necessarily to be stated in terms of syntactic features. Patterson and Caponigro (2016) show that analogous patterns occur in other languages (in fact,

(2) a. [What you ate] is pasta.

b. *[Who you met] is John.

However, the information conveyed by these features is clearly necessary for semantic interpretation as well, and in fact Chomsky notes that a grammar with selectional features in the semantics, rather than the syntax, would not be any more complicated or less adequate than the alternative, and in fact it would make the contrast in deviance shown above in (1) somewhat more straightforward: syntactic violations lead to sheer ungrammaticality, while semantic violations lead to a more minor kind of deviance. However, he tentatively settles on the view that both belong in the syntax, admitting that a better understanding of semantics might eventually lead to the opposite conclusion.

2.2.2 C-, s-, and l-selection

The idea of selectional features for semantic, rather than syntactic, properties entered the mainstream due to Grimshaw (1979), who claims that lexical items are specified in terms of selection for both syntactic categories (c-selection) and semantic types (s-selection). This claim is motivated by data such as that in (3) and (4) (examples (3)-(8) are from Pesetsky 1991, p. 2):[4]

(3) a. John asked me [$_{CP}$ what time it was].

b. John asked me [$_{DP}$ the time].

(4) a. John wondered [$_{CP}$ what time it was].

b. *John wondered [$_{DP}$ the time].

Spanish and Italian show the opposite pattern), and argue that it must be due to diachronic factors that have to do with the gradual process by which interrogative pronouns take on new roles in the grammar, which is influenced by whatever competing forms happen to be present for the different pronouns in the language.

[4]In Grimshaw (1979) the categories CP and DP are notated as S and NP respectively, and in Pesetsky (1991) as CP and NP. I have updated the notation to fit with the theoretical assumptions about phrase structure adopted here. See Section 2.4 for discussion of the phrase structural assumptions made in this thesis.

The verb *ask* can take as its complement either an interrogative CP or a DP, as shown in (3); however, the DP in (3b) is interpreted as a question with essentially the same meaning as the CP in (3a). DPs with this kind of interrogative meaning are referred to as concealed questions. In contrast to *ask*, the verb *wonder* in (4) can appear with an interrogative CP, but not with a concealed question. In other words, both *ask* and *wonder* select for complements that are interpreted as questions, but while *ask* allows these complements to be realized as either CPs or DPs, *wonder* allows only CP complements. This kind of contrast is not limited to verbs taking interrogative complements; it occurs with those taking propositional (5)-(6) and exclamatory (7)-(8) complements as well:

(5) a. I'll assume [$_{CP}$ that he is intelligent].
b. I'll assume [$_{DP}$ his intelligence].

(6) a. I'll pretend [$_{CP}$ that he is intelligent].
b. *I'll pretend [$_{DP}$ his intelligence].

(7) a. Bill couldn't believe [$_{CP}$ how incredibly hot it was].
b. Bill couldn't believe [$_{DP}$ the heat].

(8) a. Bill complained [$_{CP}$ how incredibly hot it was].
b. *Bill complained [$_{DP}$ the heat].

In each case, there are pairs of verbs that take complements of the same semantic type, but differ in terms of what syntactic categories they allow.

Grimshaw (1979) proposes that, in addition to their syntactic category, phrases are assigned a semantic type at the level of semantic representation, which includes such types as Q (question), P (proposition), and E (exclamation),[5] and presumably others as well, such as "thing/object" and "path" or "location" for typical DP and PP complements (although

[5]Following Pesetsky (1991), I indicate the abbreviations for semantic types in italics, to distinguish them from syntactic categories with the same abbreviation.

Grimshaw limits her discussion to the first three). As can be seen in the preceding examples, syntactic categories and semantic types crosscut one another: syntactic categories are not limited to a single semantic type, and vice versa. Grimshaw takes data of the type shown above to suggest that selection for the two types of categories must be stated separately: both *ask* and *wonder* s-select for the type *Q*, but while *ask* c-selects for either CP or DP, *wonder* c-selects only for CP.

On its own, this theory can describe the selectional properties of the predicates under investigation. However, it does not explain an asymmetry that exists among predicates that s-select for *P*, *Q*, and *E*: while some of them c-select for either CP or DP and others c-select for only CP, there are none that c-select for only DP. This led Grimshaw (1981) to propose that each semantic type is associated with a Canonical Structural Realization (CSR), or a syntactic category that it is "canonically" associated with; for *P*, *Q*, and *E*, the CSR is CP, while for "things", the CSR may be DP. Grimshaw supplements her theory with a *Context Principle*, which states that if a predicate s-selects for a semantic category *C*, then it c-selects for the CSR of *C* (in addition to any other categories it may select). However, this notion has been called into question.

In his thesis and a later unpublished manuscript, Pesetsky (1982, 1991) builds on the work of Grimshaw (1979, 1981) to lay further groundwork for the theory of selection. He proposes that the notion of CSRs and the Context Principle can be eliminated, making the contentious claim that c-selection can be replaced with a revised version of Case Theory. And in a more widely-accepted move, he introduces the notion of l-selection, with which a predicate selects not syntactic categories or semantic types, but instead the lexical content of the head of its complement.

Pesetsky's (1982; 1991) objection to Grimshaw's (1981) notion of CSRs and the Context Principle is made mainly on conceptual grounds. He argues that while Grimshaw's CSRs provide the right descriptive generalizations, they do not follow from existing principles and

must be stipulated;[6] given the existence of concealed questions, propositions, and exclamations, "[i]t is certainly not obvious that [DP]s are any less canonical bearers of clausal content than sentences are" (Pesetsky 1991, p. 6).[7] However, he notes that if these ideas are eliminated and DP and CP are treated as equally canonical representations of these semantic types, the data in (3)-(8) can be presented in a somewhat different light: the predicates differ in terms of whether or not they allow DP complements, which is a property that was at the time normally explained with reference to the Case Filter.

Pesetsky (1982, 1991) therefore argues that c-selection can be eliminated, and that data formerly explained in terms of c-selection is instead the result of the interaction of s-selection and the assignment of accusative Case.[8] If a verb selects for the semantic types *Q*, *P*, or *E*, it can in principle select for either CP or DP, but the latter is only possible if the verb assigns accusative Case, since CPs, but not DPs, can surface in Caseless positions. Under this analysis, because only verbs that assign accusative Case can passivize in English, there is a prediction that verbs that s-select for questions and take both DP and CP objects can occur in a passive form, while those that take only CP objects cannot. This prediction is borne out, as illustrated in (9):[9]

(9) a. It was asked what time it was.

b. *It was wondered what time it was.

Thus, since *ask* and *wonder* differ in terms of both the possibility of taking a DP complement and the ability to passivize, this supports Pesetsky's claim that the difference is due to

[6] A similar observation is made by Grimshaw (1979, p. 317).

[7] While I find Pesetsky's objection to Grimshaw's particular implementation of CSRs in the grammar to be valid, I disagree with the quoted claim. In an intuitive sense it seems quite obvious that DPs are less canonical bearers of clausal content than CPs. With the possible exception of free relative clauses, CPs can never have anything but clausal content, while it appears that the only category that can realize things/objects is DP. See Section 2.4 for a theory of nominal and clausal phrase structure from which this intuition falls out without the need for stipulated CSRs.

[8] Pesetsky (1982, 1991) refers to the Case involved as "objective", rather than "accusative", although he assumes that the two are "analogous" (Pesetsky 1991, p. 8).

[9] However, *wonder* can pseudopassivize, as in *This has been wondered about for years.* But it is appears to be due to the argument-licensing properties of the preposition *about* rather than the verb itself.

whether or not accusative Case is assigned by the verb. However, since accusative Case is, by usual assumptions, a structural (rather than inherent) Case, the ability to assign this Case should not be specified on a verb. Instead, Pesetsky assumes that verbs can by default assign this Case, and if a verb cannot do so, it is because it has an inherent Case property that renders it unable to assign any Case at all, which Pesetsky represents with the feature [+∅-case]. *Wonder* is specified with this feature, and *ask* is not.

As further evidence for the absence of c-selection, Pesetsky (1991) notes that there are no verbs that specifically select for complements of the category PP. Verbs that seem to require PP complements can be divided into two groups: verbs that s-select a locative or directional complement, which is generally (but not always) realized by a PP, and those that require a complement headed by a particular preposition, a phenomenon Pesetsky refers to as l-selection. The former case is exemplified by the verb *put*, which requires a complement that denotes a locative expression (Pesetsky 1991, p. 9).

(10) a. Bill put the book on the table.
b. Bill put the book under the table.
c. Bill put the book there.
d. Bill put the book away.

The complement of *put* is often a PP, but it may be realized by a locative adverbial expression as well, such as *there* or *away*.[10] This is best described as s-selection. The latter case is exemplified by examples such as *rely on/*in*, which require a PP headed by a specific lexical item. See Chapter 4 for extensive discussion of PP complements and l-selection.

[10]It is possible that *there* and *away* are best analyzed as pro-PPs, or perhaps *there* as a pro-form and *away* as a verb particle, the latter generally accepted to be an intransitive preposition (see, e.g., Svenonius 2010). However, it is hard to think of an element with the right kind of locative semantics that is demonstrably not prepositional, so while (10) arguably does not provide the argument against c-selection that Pesetsky intended, it also does not exemplify a case where c-selection is needed.

2.2.3 Concealed questions and c-selection

Various objections have been raised against Pesetsky's (1982; 1991) analysis of concealed questions, in terms of both his use of Case Theory to account for syntactic selection in general (e.g., Rothstein 1992; Odijk 1997; Alrenga 2005; Nathan 2006), and his particular analysis of concealed questions (e.g., Dor 1992; Nathan 2006). Here I summarize some arguments that show first that Case Theory is not a viable alternative to c-selection in general, and second that there is an account for the concealed question data that does not require c-selection, inherent Case, or any other arbitrarily-specified syntactic properties, but instead relies on the semantic properties of the verbs and complements in question. I conclude that, while Pesetsky's attempt to eliminate c-selection does not stand up to scrutiny, this does not mean that c-selection cannot be eliminated in general.

For arguments that Case Theory does not provide an adequate alternative to c-selection, I focus on the work of Nathan (2006).[11] The most obvious objection, which is noted by Nathan (2006), is that while Pesetsky's analysis eliminates the need for arbitrary c-selectional features in the lexical entries of verbs, the inherent Case feature with which he replaces it is still arbitrary. In other words, while he eliminates the mechanism of c-selection and explains why it is only the selection of DP that is (apparently) arbitrary, it does not provide a means to predict which verbs will or will not be able to take DP complements.[12]

In addition to this conceptual argument, there is empirical evidence provided by Nathan (2006) that an explanation of concealed question data in terms of the possibility of assigning accusative Case makes some incorrect predictions for the set of verbs under investigation.

[11] Arguments against the elimination of c-selection are made by Odijk (1997) and Alrenga (2005) as well, though I will not discuss them in detail. The arguments made by Odijk (1997) largely involve assumptions about the syntax and semantics of raising verbs, causative verbs, and modal auxiliaries that are no longer widely held, and the argument in Alrenga (2005) is based on the assumptions involved in a particular account of sentential subjects.

[12] Another conceptual argument is raised by Rothstein (1992), who claims that Pesetsky's proposal is incompatible with Burzio's Generalization (Burzio 1986) that whether or not a verb can assign accusative Case is predictable based on the verb's thematic properties: a verb can assign accusative case iff it assigns an external thematic role. However, the empirical adequacy of Burzio's Generalization has been called into question (e.g., Marantz 2000), and so it is unclear whether Rothstein's objections hold in present-day linguistic theory.

While *wonder* cannot take DP complements that are interpreted as concealed questions, it can take certain other kinds of DP complements (although these DPs must denote questions), including demonstratives and DPs such as *the same thing* (Nathan 2006, p. 42):[13]

(11) a. Kim wondered who left, and Sandy wondered *that* as well.

b. Kim wondered who left, and Sandy wondered *the same thing*.

Nathan shows that these elements cannot surface in Caseless positions. Thus, *wonder* must have the capability to assign accusative Case, despite not taking concealed question complements.[14]

A fully worked-out semantic explanation for the distribution of concealed questions does not yet appear to be available, as Nathan (2006) leaves certain data unaccounted for. However, the requisite ingredients for such an analysis appear to be in place: the predicates taking concealed question complements fall into a natural class (or perhaps more than one) in terms of their syntax and/or semantics; and concealed questions differ from clausal questions in their interpretation. Nathan argues that concealed questions share semantic properties with both propositions and questions, which leads to the prediction that concealed question complements can be taken by verbs that allow both interrogative and propositional complements, a prediction that is borne out, with few exceptions. While these

[13]Not all speakers accept the examples in (i) without the presence of *about*. However, Nathan marks them as grammatical, and I find that I agree with his judgements. There appears to be some dialectal variation in the acceptability of *wonder* with this kind of DP complement, as they seem to be used and accepted more by (younger) North American speakers than by speakers in the UK (Rob Truswell, p.c.). However, the fact that speakers who do accept these sentences still do not allow a concealed question complement to *wonder* supports Nathan's arguments.

[14]Nathan also makes an argument based on the fact that *know* can take clausal complements of types P or Q (*I know* {*what time it is/that he is intelligent*}), but can only take DP complements interpreted as concealed questions, not concealed propositions (*I know* {*the time/?*his intelligence*}). However, given that the interpretation of the CP complement of *know* is factive, it is not clear that it is ever of the semantic types P or Q in Grimshaw's sense, either when it is a CP or a DP complement. Therefore, it is not clear that this constitutes counterevidence to Pesetsky's proposal, although it does raise complications that are hard to explain on a selection-based account.

exceptions, which include *ask*,[15] remain problematic, these generalizations suggest that a semantic explanation is possible. In other words, the data that motivated both Grimshaw's (1979; 1981) theory of c- and s-selection and Pesetsky's (1982; 1991) Case-theoretic account can be explained without recourse to arbitrary syntactic features of any kind. Since a detailed discussion of the distribution and semantics of concealed questions is beyond the scope of this paper, I will not discuss the matter further.

2.3 Selectional asymmetry between clausal and nominal complements

The claims made in this chapter on the nature of selection (in Section 2.4) are based on data showing a selectional asymmetry between clausal and nominal complements of verbs, noted by Baltin (1989) and more recently by Bruening (2009) and Bruening et al. (2018); in this section I present this asymmetry, focusing on the exposition and analysis in Bruening et al. (2018) (which I will abbreviate here as BD&K for convenience), although most of the data and arguments discussed here were introduced in Bruening (2009). BD&K observe that the properties that determine whether a constituent can be the complement of a given verb, that is, the properties that are selected by verbs (a term used by BD&K in a sense to be clarified below), differ between nominal and clausal constituents: verbs taking nominal complements select for properties of the head noun itself, while those taking clausal complements select for properties of a functional head high in the clause, rather than the verb itself. BD&K take this as evidence that the head of a nominal argument is N, rather than D or any other functional head as proposed by Abney (1987) (among others) and widely accepted in most Minimalist studies of nominal syntax and semantics since the 1990s. In other words, BD&K propose that the "DP Hypothesis" is incorrect on the basis of the observed selectional asymmetry. In

[15] *Ask* is an exception because it can take concealed question complements despite not taking propositional complements. Nathan (2006, p. 35) argues that the subjunctive complement in sentences like *The king asked that the traitor be executed* is not a proposition, but instead is a distinct semantic type, namely a command.

this section I present the data behind the asymmetry and summarize BD&K's arguments that it cannot be reconciled with the DP Hypothesis.[16] In Section 2.4 I propose a analysis of the asymmetry in terms of s-selection that is compatible with the DP hypothesis and current views on the nominal and clausal functional sequences.

The view of selection taken by BD&K conflates the three kinds of selection discussed in Section 2.2 (s-, c-, and l-selection) into a single, strictly local mechanism: heads can select for semantic types, syntactic categories and features, and particular lexical items that characterize the (head of the) phrases they merge with, whether as a complement or a specifier. Since the head of a phrase is generally accepted as the element whose properties are visible at the phrasal level, this is taken to mean that if a predicate selects for properties of a particular element in a phrase, that element must be the head of the phrase; predicates cannot see past the head of a phrase to select for its complement or specifier(s).

BD&K observe that when verbs take clausal complements, they generally have selectional restrictions concerning such properties as clause type (e.g., question versus declarative), finiteness, and mood (e.g., subjunctive versus indicative) (Bruening et al. 2018, p. 4):

(12) *Questions versus declaratives*:

a. Sue thinks that/*whether the world is flat.

b. Sue wonders whether/*that the world is flat.

(13) *Finite versus nonfinite*:

a. Bertrand wants the world to be flat.

b. *Bertrand wants that the world is flat.

[16] I will be omitting certain pieces of evidence and lines of argumentation made by BD&K. For instance, they argue that the determination of the morphological form of elements in clauses and nominals shows a corresponding asymmetry that suggests that N is the head of a nominal phrase; however, Salzmann (2018) shows that the clausal and nominal phenomena being compared by BD&K are different in various ways and should not be treated as equivalent. In addition, BD&K provide arguments from the possible forms of idioms that I will not summarize here; I leave discussion of selection and idioms to Chapter 4.

(14) *Subjunctive versus indicative*:

a. Sue asked that the answer be/*is two.

b. Sue thinks that the answer *be/is two.

Clause type, finiteness, and mood are all properties of heads high in the clause, and all can in fact be argued to be properties of C itself. Clause type is uncontroversially a property of C, and while finiteness is generally associated with the T head, it has been shown to be linked to C as well; for example, CPs headed by *that* are always finite, and those headed by *for* are non-finite (e.g., Bresnan 1977; Baltin 1989; Chomsky 2000). Mood is also realized on the T head in most languages, although BD&K note that since some languages, such as Romanian, have separate complementizers for indicative and subjunctive clauses, mood features are plausibly marked on C as well. On the other hand, verbs taking full clausal complements never select for properties of the main verb itself, nor for particular auxiliaries, modals, or negation. Since it is C that is selected for, rather than V or any other head, BD&K argue that C must be the head of the clause.

In contrast, verbs taking nominal arguments never select for properties of functional heads, such as determiners, possessors, or numbers. As Baltin (1989) points out, there are no verbs that allow nominal complements without a possessor but not those with a possessor (15); BD&K add that there are also no verbs that allow indefinite but not definite complements (adapted from Bruening et al. 2018, p. 5):[17]

(15) *Nonexistent selectional pattern*:

a. John glorped (the) books.

b. *John glorped his books.

[17]As noted by BD&K, there are contexts in which definite nouns are not possible, specifically in existential constructions, as in *There is a/#the child*, which is ungrammatical under the normal existential interpretation of the *there is* construction (Milsark 1977). However, Barwise and Cooper (1981) argue that this is due to the semantics of the construction, as the presence of a definite noun leads to a tautology, and is thus deviant in most contexts. BD&K claim that this and similar examples, such as the requirement for definite nouns in topic constructions, are consequences of the semantic properties of certain constructions, rather than selectional requirements of any lexical items.

(16) *Nonexistent selectional pattern*:

a. Samuel is streading a book.

b. *Samuel is streading the book.

An apparent exception occurs with verbs, such as *gather*, that require a plurality as their complement (Bruening et al. 2018, p. 5):

(17) a. I gathered the students.

b. *I gathered the student.

c. I gathered the French Club.

d. *I gathered the scissors.

These data appears at first glance to require selection for the syntactic features of number. However, as shown in (17), the verb *gather* is compatible with a grammatically singular noun with a plural meaning such as *the French Club*, while it cannot take a grammatically plural noun phrase with a singular meaning such as *the scissors*. Thus, the plurality selected by verbs like *gather* appears to be a semantic property of the nominal as a whole, rather than a syntactic property associated with any one head, functional or otherwise.

While verbs taking clausal complements normally select for a full CP, BD&K note that there are verbs that take VP complements without any TP or CP projection (18) (adapted from Bruening et al. 2018, p. 6):

(18) a. Mary had [$_{VP}$ her brother open the door].

b. Nobody heard [$_{VP}$ it rain last night].

c. I want [$_{VP}$ it understood that an order was given].

d. We all feared [$_{VP}$ John killed by the enemy].

e. I made [$_{VP}$ them leave the room].

As expected, with a VP complement verbs can impose restrictions on properties of V itself; for example, many of the verbs in (18) require the VP to have an eventive, rather than stative, interpretation (e.g., **Mary heard/made John know the answer*). Thus, despite the head of the clausal projection being C, some smaller element than CP (namely, VP) can be selected for. This is expected if C and V head their own separate projections in the clause.[18]

BD&K discuss various attempts to account for these facts within the DP Hypothesis, but find none of them satisfactory in explaining the asymmetries above, as opposed to an alternative state of affairs (i.e., verbs select for V in clausal complements, or D in nominal complements). I will focus on extended projections here, because it is the most commonly appealed-to attempt, as well as the one most relevant to this thesis; and in any case, BD&K's objections to extended projections are essentially the same as those for the other attempts. The theory of extended projections, which began with Grimshaw (1991) and van Riemsdijk (1998), states that the "extended projection" of a lexical head X includes not just XP, but a set of functional heads associated with X and their phrasal projections. According to Grimshaw (1991) and van Riemsdijk (1998), this includes TP and CP for V, and DP and PP for N.[19] Members of an extended projection share certain features, so TP and CP have some verbal properties, and DP and PP have nominal properties. These nominal properties are visible for selection, so a predicate selecting a nominal element can select for properties of the head N even if higher projections are present. This preserves aspects of the DP Hypothesis while allowing verbs to select properties of N in a DP complement. However, BD&K note

[18]BD&K argue that an equivalent phenomenon does not happen with nominal complements: no predicates selects only for bare nouns or nominals that lack determiners or other functional heads, as might be expected if D and N head separate projections in nominals. However, it has been shown that in Inuktitut (Johns 2007) and in Niuean (Massam 2009) there are predicates that require a (pseudo-)incorporated bare nominal complement. In each case, there is an explanation based on the semantics of the selecting items. In Inuktitut, the only verbs exhibiting obligatory noun incorporation are light verbs, which are characterized by a lack of substantive (i.e., non-functional) meaning; Johns (2007) analyzes them as elements of the category v which, due to the syntax of Inuktitut root categorization in general, must attach directly to some (nominal) root, thus leading to the appearance of c-selection (for N(P)/root) without the need for arbitrary lexical features. Similarly, in Niuean obligatory pseudo-noun incorporation is limited to the class of existential verbs (Massam 2009), meaning that arbitrary lexical specification for obligatory incorporation is unnecessary.

[19]In Section 2.4 I discuss and adopt a more recent theory of extended projections with added heads in both projections, and which does not include PP as a part of the nominal extended projection.

that this does not explain the asymmetries discussed above, in that it leads to the prediction that verbs *should* be able to select for properties of V in a CP complement, contrary to fact. Thus, they dismiss the theory of extended projections.

BD&K conclude that the DP Hypothesis is incorrect, and instead D(P) appears within the NP. The selectional asymmetry motivating this conclusion is not limited to English: BD&K show that it exists in Korean and Vietnamese as well. It poses a real (though not often acknowledged) problem for existing theories of selection and phrase structure, which predict either that a predicate can select a lexical head dominated by associated functional heads, or that selection is limited to the top functional head, regardless of whether the lexical head is N or V. In the following section I propose a theory that maintains elements of the DP Hypothesis (specifically, a hypothesis of extended projections)[20] while explaining the asymmetry between clauses and nominals in terms of differences in the semantic types present at various points in the extended projections.

2.4 Selectional asymmetries without c-selection

In this section I propose a theory of phrase structure and s-selection that accounts for the selectional asymmetry described above without reference to syntactic categories or features, and without abandoning the notion of functional projections in the noun phrase. I propose that the phasal constituents CP, *v*P (or, I will argue, an Asp(ect)P), and DP constitute distinct interpretive domains: CP denotes propositions, generally with some illocutionary force; *v*P denotes a description of an event or state; and DP denotes an individual.[21] It is these domains and their semantic properties that get selected for by predicates, rather than syntactic categories and features. Being a matter of semantics, this selectional relationship is established not in the narrow syntax, but at the point at which the phase containing the

[20]However, while extended projections are like the DP Hypothesis in that they posit that there functional heads above N that head project their own phrases (e.g., DP), they differ in that the head of the nominal extended projection is, in a sense, N rather than D.

[21]I assume that there are other domains of this type as well, such as PP and AP, although I do not discuss those further here. See Chapter 4 for discussion of PPs and their interpretation.

selecting head is transferred to the semantic interface; this explains why material embedded in the selected phase is not visible to selection, as it will have already been transferred and so will not be visible at the interface at this point in the derivation.

Thus, the asymmetry can be explained: A verb taking a propositional (CP) complement will not be sensitive to properties of the embedded eventuality (vP) since the properties of that eventuality will have already transferred, and so will be inaccessible to the verb at the point in the derivation where the verb and its are transferred. On the other hand, predicates taking individuals (i.e., DPs) as complements may be sensitive to properties of the head noun, since the whole nominal extended projection is within a single domain and therefore accessible at the point where they are transferred. I start in Section 2.4.1 by motivating and presenting the three semantic domains that I will be assuming. Then in Section 2.4.2 I outline the theory of s-selection that explains the selectional asymmetry. Finally, in Section 2.4.3 I discuss the relationship between s-selection and the internal structure of extended projections.

2.4.1 Phases and semantic domains

The facts of selection as outlined above in Section 2.3 show that in terms of clausal and nominal complements, there are three main kinds of constituents that are selected, each with its associated properties. Predicates that select for CPs are sensitive to such things as whether the complement is finite or not, interrogative or not, subjunctive or indicative, and so on. Predicates that select for vPs may be sensitive to whether the complement is an eventive or stative predicate, and perhaps to physical properties of the event (e.g., whether it can be seen, heard, etc.). Predicates that select for DPs may be sensitive to whether the complement is singular or plural, animate or inanimate, abstract or not, and so on. While these properties have syntactic correlates, they all can be considered to be semantic properties, since they affect the interpretation of constituents. These domains line up with the constituents that are generally accepted as phases, with C, v, and D (and potentially others, such as some

adjectival and prepositional functional heads) as phase heads (e.g., Chomsky 2000, 2001, 2008; Citko 2014; Chomsky et al. 2017). Here I discuss these domains and their relevant properties, beginning with a brief discussion of phases.

Questions about the identity, nature, and even existence of phases in syntactic theory are still under lively debate in the literature; see Citko (2014) for a detailed overview, and Chomsky et al. (2017) for recent discussion.[22] However, the precise characterization of phases and their role in syntactic theory is mostly irrelevant to the current discussion. What is relevant is that the semantic domains involved in s-selection correspond to constituents that have been shown to constitute locality domains in various independent respects, involving diverse phonological, syntactic, and semantic properties.

While there has been extensive discussion of the syntactic and phonological properties associated with phases, there does not appear to have been as much discussion of their semantic properties (Citko 2014). In general, phases are considered to be "complete syntactic objects", "relatively independent in terms of interface properties" (Chomsky 2000, p. 106), but there does not appear to be much consensus of what is meant by "complete" and "independent" in this context. Syntactically, phases are the domains of feature valuation, with phase heads as the locus of uninterpretable features, and define locality domains for movement; phonologically, phase heads trigger spellout and so define the domains of phonological processes. In terms of semantics, however, it is not clear what properties should be associated with phases, except that they are "complete"/"independent" entities at LF. A more explicit statement is made by Chomsky (2000), who claims that a phase is "the closest syntactic counterpart to a proposition: either a verb phrase in which all theta roles are assigned or a full clause including

[22]Under some analyses (e.g., Chomsky 2000), the phasal status of vP depends on whether the verb is (active) transitive or unergative (sometimes called v*P), or unaccusative or passive (just vP, or VP), with the former two types considered phases, and the latter two not. v*Ps have more phasal properties than the other types, especially in terms of features and their valuation (Chomsky 2001; Citko 2014). However, they all still constitute locality domains in that movement out of both v*Ps and vPs must proceed through the edge, as shown by Legate (2003) with evidence from reconstruction effects, Quantifier Raising, and parasitic gaps. I follow Legate in assuming that all instances of vP are phasal.

DPs, too, are excluded from the original definition of phases (Chomsky 2000). However, they show many properties associated with phases (Citko 2014) and so are generally included under more recent definitions of phases. Again, since they pattern with CP and vP in terms of selection, I assume that DP is a phase as well.

tense and force" (p. 106). Of course, the word "proposition" is used here in a sense somewhat differently from that generally used in semantics: instead of referring to a statement with truth conditions, Chomsky appears to use it to refer to a predicate and its arguments.[23]

The correlation of phases with the semantic domains involved in selection suggests that semantically, phases should be characterized as (potentially) complete descriptions of specific kinds of entities: objects (or individuals) for DP, eventualities (used in the sense of Bach 1986, including dynamic events and non-dynamic states) for vP, and propositions (or questions, commands, etc.) for CP. A similar claim has been made by Arsenijević and Hinzen (2012). For DPs, this is a fairly unproblematic claim, although see below for some discussion of whether or not there are other semantic domains within the DP, as claimed by Zamparelli (2000) (I conclude that there are not). For vPs and CPs this lines up with various claims about the semantics of different parts of the clausal spine, although the claims are not often made with reference to phases (with the exception of Ramchand 2008, 2018).

The eventuality domain

The idea that there is a division in the clause, with the lower part describing an eventuality and higher parts denoting something else, dates back at least to Higginbotham (1983), who analyzes reports of direct perception such as (19) as in (20) (p. 107):

(19) John saw Mary leave.

(20) [$\exists x$: x is an event & leave(Mary, x)] John saw x.

In other words, there is an event of Mary leaving, and John sees that event. This analysis is adopted in Moulton (2009, p. 136) as well, and accounts for various properties that set direct

[23]As noted in Footnote 22, Chomsky in that paper does not consider unaccusative and passive vPs to be phases, on the grounds that they do not assign an external theta role and so do not have a "complete" argument structure. However, it is not clear how unaccusative vPs are incomplete, since they do not "select" or require an external argument anyway (Citko 2014). This constitutes additional motivation (adding to the cyclic movement evidence from Legate 2003 discussed in Footnote 22) for my assumption that vP is phasal in all cases.

perception reports with bare infinitive complements as in (19) apart from reports of indirect perception, where the same verb takes a full CP complement, as in (21):

(21) John saw that Mary left.

In the two types of perceptual reports, the relationship between the experiencer (John) and the thing perceived (Mary's departure) is different. In (19) but not in (21), John must have witnessed Mary's actual departure; in (21) he did not necessarily see her leave, but he came to know through things that he saw that she had left (e.g., he may have looked around and noticed that she was not present and her car was no longer in the driveway). Furthermore, in (19), John may not realize that what he saw was Mary's departure; hence, adding a continuation such as *but he thought she was still present* is not a contradiction for (19). In contrast, this kind of continuation is not possible with (21), in which John must be aware of the fact that Mary has left (even if he did not perceive it directly). In other words, direct perceptual reports such as (19) denote that an event is perceived but assert nothing about what the perceiver does or does not know, while indirect perceptual reports such as (21) mean that the subject has come to know a certain fact using one of their senses, but do not mean that any specific event was perceived (Moulton 2009). This is related to the fact that the complement of a direct perceptual report denotes an event, while the complement of an indirect perceptual report denotes a proposition.[24]

In Higginbotham's (1983) analysis, then, *v*Ps (or in his terms, naked infinitives) are analyzed as descriptions of individual eventualities, indicating an action or relationship involving different individuals but not specifying any particular time interval; temporal information is contributed by T and similar heads in the higher phase (see, e.g., Felser

[24]See Moulton (2009, Ch. 4) for extensive discussion of various kinds of perceptual reports. Moulton also discusses sentences where perceptual verbs take infinitival complements, as in *Martha saw Fred to be driving too fast*. As with finite indirect perception reports, these are analyzed as involving the perceiver coming to hold some belief, suggesting that the infinitival complement is more like the proposition denoted by a finite CP than like the eventuality denoted by *v*P, which accords with the current proposal. However, I will not discuss infinitive clauses in detail in this thesis.

1998; Ernst 2002; Grohmann 2003; Ramchand 2008, 2018; Ramchand and Svenonius 2014; Wiltschko 2014, and citations therein for similar claims). In this way, they are similar to DPs, which also assemble an individual description, except that the individual denoted by a DP is generally an object rather than an eventuality; however, deverbal nouns are generally analyzed as eventuality descriptions, as pointed out by Higginbotham (1983), and so vP complements like (22) receive an interpretation quite similar to DP complements derived from the same noun, as in (23) (Higginbotham 1983, p. 107):

(22) John saw Mary depart.

(23) John saw Mary's departure.

According to Higginbotham, the only interpretational difference between the two is that the complement in (22) is an indefinite event description, while that in (23) is definite.

While I have been referring to the category of these uninflected verb phrases as vP, there is evidence that the category is actually the projection of an aspectual head, specifically that which hosts the English progressive *-ing* suffix (Felser 1998; Ramchand and Svenonius 2014; Harwood 2015; Ramchand 2018). Felser (1998) motivates this claim by showing that a verb suffixed with *-ing* can appear in the complement of direct perception reports, as in (24):

(24) a. Mary saw John drawing a circle.
b. Mary heard it raining.
c. Mary felt something dangerous approaching.

Felser notes that in many such examples, including (24a), the complement can be analyzed as a DP with the participle (and its complement) as a modifier, with a meaning like 'Mary saw John as he was drawing a circle'. However, in examples such as (24b) and (24c), in which the nominal following the perception verb is not interpreted as itself being directly perceived (i.e., the "weather-*it*" in (24b) is not interpreted as being actually heard, and in

(24c) what is (figuratively) "felt" is the approach, not the thing itself), the thing perceived is unambiguously an event, as in cases without *-ing*.

Felser further shows that the *-ing* in these sentences is the same morpheme, with the same meaning, as in matrix progressive clauses. Specifically, when perception verbs appear with an *-ing* complement, the perceiver is understood as seeing an ongoing event, but not necessarily the event as a whole, while without *-ing* the subject must perceive the whole event, as illustrated by the contrast in (25) (Felser 1998, p. 355):

(25) a. *I saw her **drown**, but I rescued her.

b. I saw her **drowning**, but I rescued her.

In (25a), the subject must have seen a full event of a person drowning; since drowning ends in death, rescue is impossible, so (25a) is a contradiction. In (25b), on the other hand, the subject saw an event of drowning in progress, with no entailment that the end of the event was seen, so the sentence is not a contradiction. In other words, the contrast between (25a) and (25b) is that of perfective versus imperfective (or progressive) aspect, which is to be expected if the *-ing* morpheme is a progressive Asp(ect) head.

The conclusion that the progressive *-ing* head forms a coherent unit with the lower phase of the clause, rather than the upper phase, is supported by movement evidence provided by Ramchand and Svenonius (2014) and Harwood (2015).[25] For instance, in the English expletive *there*-construction, the thematic subject can appear only in one position, immediately preceding the progressive participle, as illustrated in (26), where the full range of English auxiliaries is present (Ramchand and Svenonius 2014, p. 156):

(26) a. *There could have been being a truck loaded.

b. There could have been a truck being loaded.

c. *There could have a truck been being loaded.

[25]Ramchand and Svenonius (2014), as well as Ramchand (2018), label the head as V_{EVT} and Evt respectively. I stick to the more familiar notation of Felser (1998) for convenience.

d. *There could a truck have been being loaded.

e. *There a truck could have been being loaded.

Furthermore, in examples with VP fronting and pseudoclefts, the constituent being targeted must include the progressive auxiliary, and cannot include higher auxiliaries, as shown in (27) for VP fronting and (28) for pseudoclefts (Ramchand and Svenonius 2014, p. 156):

(27) If Mary says the cakes will have been being eaten, then ...

a. *... [eaten], they will have been being.

b. ... [being eaten], they will have been.

c. *... [been being eaten], they will have.

d. *... [have been being eaten], they will.

(28) A: John should have been being praised. B: No, ...

a. *... [criticized] is what he should have been being.

b. ... [being criticized] is what he should have been.

c. *... [been being criticized] is what he should have.

d. *... [have been being criticized] is what he should.

Thus, in addition to Felser's syntactic evidence, there is evidence that a constituent including progressive *-ing* forms a unit relevant to movement as well; this is consistent with the constituent being a phase. This is in contrast with the perfective *-en* suffix and higher auxiliaries, which fall into the upper phase.

Ramchand and Svenonius (2014) argue that the presence of progressive *-ing* in the lower phase, in contrast to perfective *-en* in the upper phase, reflects a difference between the two in terms of their semantic relationship with the event denoted by the vP. Recall that the event denoted by the lower phase does not include temporal properties; the temporal parameters, and their anchoring to the utterance time (i.e., specification for tense), occurs in

the C-T domain. Ramchand and Svenonius argue that the English perfective aspect picks out a period of time that is not congruent with the run time of the event denoted by vP. Specifically, it picks out a reference time which is preceded by the run time of the event; this reference time is then located relative to the utterance time by the tense morpheme (past, present, or future). For example, in (29), the tense is present, but the event of writing the letter must have occurred in its entirety prior to the time of utterance (Ramchand and Svenonius 2014, p. 159):

(29) John has (now) written the letter.

They argue that this is due to both the perfective morpheme and the tense morpheme having their own temporal properties, which is made possible by both being in the higher phase. On the other hand, the temporal reference point denoted by the progressive aspect cannot be outside the run time of the event in this way. Ramchand and Svenonius claim that this is because the progressive morpheme does not pick out a time interval at all, but instead a mereological subpart of the event denoted by the vP, specifically a non-final part of the event (which is only possible with dynamic events, hence the morpheme's incompatibility with stative predicates). While this subpart is necessarily a distinct time interval from that occupied by the entire event, the crucial difference is that it must be contained within the full event's time interval. Thus, consider the sentence in (30):

(30) John is building a house.

While this sentence may be true even if the house is not "built" (i.e., completed) for quite some time after the sentence is uttered (indeed, it may never be completed at all; see Copley and Harley 2015; Ramchand 2017, 2018), crucially the event of building must be underway in some form or another. Furthermore, with progressive aspect separate temporal modification

of the different mereological subparts is not possible, as shown in (31) (Ramchand 2017, p. 245):

(31) a. *John is building a house tomorrow now.

b. *John was building the house today yesterday.

Thus, the time interval picked out by the progressive aspect is more closely tied to the event denoted by the VP than that associated with the perfect. This state of affairs falls out naturally if the progressive is located in a part of the clause where temporal information has not yet been added, while the perfective is located above this point.

The propositional domain

The above discussion suggests that the clausal functional sequence can be divided into at least two zones: a lower zone, which we will call AspP following Felser (1998), and a higher one that includes T and C, as well as any aspectual and modal heads above the progressive morpheme (in English, at least; see Ramchand and Svenonius 2014 for some discussion of how some other languages differ from English in terms of which auxiliaries fall into which zones). These zones line up with the classic phases, and also with syntactic and semantic accounts of complements of direct perception that pre-date theories of phases and extended projections (e.g., Higginbotham 1983). However, while there are many theories that divide the clause into multiple semantic domains, many of these involve more than just two domains. Specifically, TP and CP are considered to constitute separate semantic domains in some analyses, including those of Grohmann (2003), Ramchand and Svenonius (2014), and Wiltschko (2014).[26] While

[26]Wiltschko (2014) divides the clause into four zones. Starting from the bottom, they perform the functions of classifying eventualities (verbal root elements), establishing point-of-view in the eventuality (aspectual heads), anchoring of deictic parameters (tense/Infl heads), and discourse linking (C and the left periphery). While these four kinds of heads may perform distinct functions, in my analysis I consider the classificational role to be played in the lower phase (as well as at least some of the point-of-view heads), while the rest are functions of the upper phase, all arguably playing different roles in "anchoring" the eventuality to the utterance or discourse context. Wiltschko also proposes that the nominal extended projection is divided into the same four domains; see discussion of the structure of the nominal domain below.

T and C, and the heads related to each, play distinctive semantic and syntactic roles in the clause, for my purposes they are part of the same semantic zone.

In the proposal of Ramchand and Svenonius (2014) (as with that of Grohmann 2003), TP and CP represent distinct semantic domains, yet their properties are not as distinct from one another as either is from the lower phase. The TP domain introduces the temporal parameters that are absent in the lower phase, and provides specification for these parameters in the form of (upper) aspectual, modal, and tense marking. At the upper bound of this domain, the eventuality is fully anchored to the utterance situation, and so in the CP domain, discourse and speaker-oriented modification can occur. Ramchand and Svenonius consider the two zones to denote objects of different ontological types: situations (i.e., eventualities endowed with temporal parameters) in TP, and propositions in CP. However, the main difference between the two is that the temporal parameters are not fully specified in the TP domain, while they are in the CP domain. In a later version of the analysis, Ramchand (2018) still considers the two domains to be distinct, but only in their functions in the clause, not in ontological type: they differ mainly in that the temporal anchoring parameters are not fully specified below TP, and above TP they are. I consider this contrast to be analogous to the difference between the bare VP and the complete AspP phase: the semantic description becomes more complete and fleshed-out as the phase is built up, meaning that the upper part of the phase has properties that are absent in the lower part, but this does not imply that the two parts of the phase are of different semantic ontological types. In other words, while further subdivision of the two domains as in Ramchand and Svenonius (2014), Wiltschko (2014), and Ramchand (2018) is illuminating in terms of what kinds of auxiliaries, modifiers,

Another proposal worth mentioning is that of Ernst (2002), who proposes a Fact-Event Object (FEO) Calculus in which the semantic type of the clause is built up in the following stages: Specified Event, Event, Proposition, Fact, Speech Act. The FEO Calculus also specifies that any one of these types can be freely converted (i.e., at any point in the clause) into any higher type, and that certain heads can also convert it to a lower type. While this work has had important influences on later work, it provides more distinctions than are needed in this work, as well as too much flexibility in the syntax-semantics mapping. While I admit that further flexibility may be needed in order to account for the adverb ordering facts that motivated Ernst's analysis, I will not consider his FEO Calculus further in this thesis.

and so on can appear in which parts of the clause, it does not appear to affect the domains that are involved in selection, which involve the coarser phasal divisions in the clause.

The object domain

Similarly, the claim that the nominal extended projection contains only one semantic domain is not universally accepted. While there are many proposals, some highly articulated, for the syntactic structure of DPs (e.g., Zamparelli 2000; Borer 2005a; Laenzlinger 2005, 2010; Svenonius 2008; Wiltschko 2014), most of these are concerned mainly with the syntactic effects of the structure, and do not make explicit claims about the semantic ontology involved; the exact number of syntactic heads per se is not relevant to the current discussion. Often when such claims are made, the motivation is the supposed parallelism between clausal and nominal extended projections, presupposing that the ontological makeup of nominals must mirror that of clauses (see, e.g., Laenzlinger 2005, 2010; Wiltschko 2014; Ramchand 2018). However, as we saw in Section 2.3, this symmetry does not apply to the selectional properties that have motivated the current analysis, and so I do not consider arguments based on them to apply to this analysis.

The one proposal I am aware of in which the different levels of the nominal extended projection correspond to semantic entities of different sorts, in the same sense as proposed above for clauses, is that of Zamparelli (2000), in which there is a Kind projection (KIP) immediately dominating NP which is interpreted as a *kind*, which is ontologically separate from the argument type of the nominal as a whole. However, while kind readings are available for nominals, they involve various levels of structure, both within and between languages; for example, English kind-denoting nominals may be bare mass nouns or plurals, or definite noun phrases (Carlson 1977; Krifka et al. 1995; Chierchia 1998). The kind denotation appears to depend more on the context in which the nominal occurs than on the internal structure of the nominal, and it is certainly not limited to nominals lacking the upper layers of the clause, since they can include the definite article. Therefore I assume, contra Zamparelli, that kinds

do not correspond to a distinct domain within the nominal projection, and therefore that the nominal extended corresponds to a single semantic domain throughout the functional sequence. This is in accordance with phase theory, where DP is standardly assumed to constitute a single phase, unlike the clause.

Summary

I propose three semantic domains, one nominal and two clausal, that are associated with different types of semantic objects, and which correspond to the three classical phases: CP, vP (or, more accurately, AspP), and DP. In DP, descriptions of individual objects are assembled, which may be single items or pluralities, abstract or concrete, animate or inanimate, definite or indefinite, and so on; these various meanings are built up over the course of the functional sequence, but the denotation is an object description throughout the process. In the AspP the description assembled is that of an eventuality, which has one or more participants and may consist of more than one subevent; the Asp head may further specify a particular part of the event, which may be the event as a whole. The CP constructs a proposition, which is anchored to the utterance situation and has some force. This provides a semantic characterization of the classic phases in which each corresponds to a (potentially) complete description of some kind of semantic entity; this is similar to the proposal of Arsenijević and Hinzen (2012).[27]

This point of view provides a way of thinking of the three phases in a way such that a symmetry holds between DP and AspP, rather than between DP and CP as in the standard view of the relationship between nominals and clauses. Both DP and AspP are interpreted as descriptions of entities that may exist in the world, either as objects or as eventualities that those objects may participate in. In other words, objects and eventualities are *particulars* (see, e.g., Davidson 1970; Maienborn 2018): they denote entities or situations that can be located

[27]In practice, these descriptions are not always complete, as when elements of a phase are omitted or moved out of that phase; however, each constituent has the potential to comprise a complete description, all else being equal.

in the world, and which are unique in the sense that no two separate objects or eventualities can be considered to be the same entity, even if they can receive identical descriptions (e.g., even if the participants and the eventuality itself are identical, two events of a man kicking a ball cannot be described as the *same* event; likewise for seemingly identical individuals, such as twins); see Higginbotham (1983), Tenny (1987), Felser (1998) for similar claims of symmetry between DP and AspP. On the other hand, the denotation of CP is not a particular: while propositions can be described as properties of possible worlds, they are not located in space and time in the same way as objects and eventualities; instead, propositions are abstract objects that are introduced for various cognitive operations, but do not have an independent existence outside our minds (Maienborn 2018).[28] This state of affairs is not expected in a model where DPs and CPs are assumed to be parallel; in such a model, any similarities of that sort would be expected to hold between DP and CP, rather than DP and AspP. Having established the existence of the three relevant domains, we now turn to their selectional properties.

2.4.2 S-selection and semantic domains

The theory outlined above, in which phases delineate semantic domains, each of a separate semantic type, allows for an account of Bruening et al.'s (2018) selectional asymmetries that is stated in semantic, rather than syntactic, terms. I propose that selectional properties of predicates are limited to material in the closest semantic domain/phase; a predicate cannot select for properties of other phases embedded within the complement. So, a predicate selecting for a propositional complement (CP) may be sensitive to features of that proposition (e.g., finiteness, mood, whether it is a question, statement or exclamation, etc.), but not properties of the eventuality conveyed by that proposition (i.e., the embedded AspP). On the other hand, predicates selecting for eventualities (AspP) may be sensitive to properties of the

[28]Maienborn (2018) argues that certain kinds of states are also abstract objects in the same sense as propositions. The same is likely true of many abstract nouns. Thus, the difference between AspP and DP on the one hand and CP on the other is that the former domains can (and frequently do) denote particulars, while CP cannot.

eventuality, and predicates selecting for objects may be sensitive to any properties of that object, including properties of the head noun itself.[29]

Specifically, I propose that selectional relationships are established at the points at which syntactic material is "transferred" to the semantic (or "conceptual-interpretive") interface (see, e.g., Chomsky 2000, 2001, 2008; Citko 2014; Chomsky et al. 2017 for discussion of the exact mechanism behind this). In the point of view defended in this thesis, selection is not part of the narrow syntax at all: it does not involve reference to formal features or syntactic categories at all, but rather the interpretive correlates of these features. Thus, I claim that selection plays no role in the narrow syntax itself; I assume, following Chomsky et al. (2017), among others, that the narrow syntax is free to create any kind of complementation structure that is possible through Merge. It is at the interfaces that the well-formedness of the resulting structure is determined. At the point at which a phase is transferred to the interfaces, any material that has been previously transferred is inaccessible, as is material above the transferred constituent. This means that when selectional relationships are established, all that is visible to the interface is the selecting predicate, the associated functional material in its phase, and the top part of the phase associated with the predicate's argument(s). This includes (semantic) information contributed by heads within that phase,[30] but crucially excludes any contributions from phases embedded within the argument.

The selectional asymmetries of Section 2.3, then, are a consequence of this proposal. This keeps many standard assumptions about selection, and renders some others unnecessary. As

[29]It remains somewhat of a mystery why verbs never seem to select for features of D itself, such as definiteness and possession, as pointed out by Baltin (1989). This may be an accidental result of the kinds of meanings that verbs and determiners denote; perhaps there is just no verbal meaning that could ever be sensitive to whether or not the complement definite, or possessed. This must remain as a question for further investigation. However, as mentioned in Footnote 17, there are constructions that require definite or indefinite DPs, such as existential sentences and topic constructions.

[30]Since, by standard assumptions, the only part that remains in the syntax after transfer is the phase head (and its specifier), I must assume that the head of a phase is endowed with all of the relevant semantic properties introduced by heads in that phase. This assumption receives support from the fact that these heads are often morphologically marked for features of the lower head. For instance, D is often inflected for number, gender, and so on, and as mentioned in Section 2.3, C is often marked for finiteness, mood, and other features generally associated with lower heads. Since these heads can be overtly marked for these morphosyntactic features, it is likely that they are semantically associated with the interpretive correlates of the features as well.

pointed out by Bruening et al. (2018, p. 2), and argued for in works cited there, selection is strictly local: heads can select only for properties of their immediate sister (or a specifier, which is in a sisterhood relation to a projection of the head). The difference is that what is being selected is not a particular head or its features, but a semantic entity corresponding to an entire phase or semantic domain. What cannot be selected for are features contained in phases that are embedded in the complement. This rules out sensitivity to properties of the complement AspP phase when a predicate selects for a proposition (CP), in the same way that properties of arguments of a selected constituent (whether the constituent is propositional, eventive, or an object) are not selected for. For example, there is no verb that takes DP complements but requires that the noun have a complement, and similarly for the CP and AspP phases.

Note further that, in this system, reference to syntactic features is not necessary. With selection targeting semantic domains, category features become irrelevant. Furthermore, the syntactic features that have been argued to be relevant in selection arguably have semantic correlates. For nominals, the features selected include things like whether the complement is animate, abstract, and so on, which are clearly related to the semantics of the nominal, and even when a plurality is selected for, it is semantic plurality rather than the syntactic feature that is relevant, as seen in (17) above. On the clausal side, properties such as whether or not the clause is a question have clear semantic consequences. The semantic contributions of finiteness and mood are less clear (Pesetsky 1991), but Wiltschko (2014) provides a recent account of the semantic contribution of these kinds of features in terms of how the embedded clause is anchored to the matrix proposition. Thus, c-selection is unnecessary, in terms of both syntactic categories and finer-grained syntactic features.

Under the current account, then, selection is concerned only with semantic features of the complement; however, it is constrained by phases (and the semantic domains associated with them), which is not a property that is generally associated with semantic well-formedness. Below, I illustrate this with the examples of *alternately* and *respectively*, whose interpretation

depends on properties of the event which may be located far away in the structure of the sentence, across multiple phase boundaries. This suggests that selection, despite it semantic nature, shouldn't be seen as involving conditions on the structure of a sentence as a whole, but is instead active at the syntax-semantics interface, where both syntactic and semantic properties are relevant.

This is not to say that predicates cannot have meanings that are incompatible with elements outside the immediate closest phase. This can be seen with adverbials like *alternately* and *respectively*.[31] Consider the sentence in (32):

(32) The light flashed green and red alternately.

The adverbial is only felicitous in a specific situation involving subintervals where the light is green, followed by subintervals where it is red, and there specifically must be at least two of each kind of subinterval (arranged in a red-green-red-green pattern). Thus, the denotation of *alternately* must make reference to at least four different existentially-bound time intervals, which (by hypothesis) must be located in the CP clause, despite the fact that (as a manner adverb) *alternately* appears to modify the AspP clause (Ernst 2002). Similarly, consider the following sentence:

(33) a. Daddy bear, mommy bear, and baby bear ate porridge that was too hot, too cold, and just right respectively.

b. *The three bears ate porridge at three temperatures, respectively.

In (33a) we see that *respectively* requires a set of DPs and a set of APs, with equal numbers of elements in each set, and in (33b) we see that this is syntactically conditioned, in that each argument must be syntactically present in its own right – and all this despite the adverb being in a complex noun phrase where they ought not to be visible to the adverb.

[31] Thanks to Rob Truswell (p.c.) for pointing this out, and for providing many of the following examples.

This tells us that there can be fine-grained conditions on the felicity of predicates in certain contexts that have different locality conditions than the s-selection that has been considered here. However, I argue that these conditions are not the same sort of thing as s-selection. Instead, they belong to world knowledge and the non-grammatical, encyclopedic content of lexical items: it is not *ungrammatical* for *alternately* to modify an event with fewer subintervals, or where the subintervals appear in a different pattern (e.g., green-red-green-green). However, since this would contradict our knowledge of the meaning of *alternately*, the sentence would be deviant. Similarly, the agent of *kick* must be an entity with legs, ruling out (34), but we do not consider "having legs" to be a grammatical feature of a DP in the same way that definiteness and plurality are. Instead, (34) faces a similar kind of deviance to that of Chomsky's famous example, (35).

(34) ??The snake kicked the ball.

(35) ??Colourless green ideas sleep furiously.

The sentences are deviant, but this can be attributed to world knowledge and the content of the lexical items when the meaning of the sentence as a whole is interpreted (as in (1b) in Section 2.2.1; Chomsky 1965), not to properties such as selection that are active at the points in the derivation where the syntax-semantics interface is accessed (i.e., at spellout).

Thus, while there are elements of word meaning that are sensitive to properties of the sentence as a whole, the properties generally attributed to selection or subcategorization, determining the categories and properties that a predicate can have as its arguments, are semantic and phase-bounded. What is selected is mediated not by formal features in the syntax, but by interpretive properties evaluated at the semantic interface, at the point of the derivation at which the selecting phase undergoes transfer. This provides a theory in which selection is entirely semantic, yet it is bounded by the syntactic structure in specific ways, being sensitive to the (coarse-grained) semantic type of the nearest phase. This provides

an account for the selectional asymmetries of Section 2.3 without involving any syntactic features, nor any semantic features that are not independently motivated. Incidentally, it also provides a natural semantic correlate for the three classic phases: CP is a description of propositions, vP (or more accurately, AspP) is a description of eventualities, and DP is a description of objects. When an entity of one semantic class is formed and the next-highest head is merged, the completed object is spelled out and becomes opaque to selection.

2.4.3 Selection and extended projections

In the analysis outlined above, selection is a (semantic) relationship, established at the point of transfer to the semantic interface, that holds between a verb (or other selecting predicate) and its complement(s). This does not account for the relationships between heads and their complements within a given extended projection (e.g., those between C and TP, v and VP, Num and NP, and so on), despite the fact that these relations have been often treated as instances of c-selection (e.g., Grimshaw 1991; Bruening 2009; Adger 2010; Bruening et al. 2018), sometimes with additional constraints that fix the order of the functional hierarchy. However, I claim that the relationships between heads in an extended projection should not be subsumed under the selectional mechanism proposed above, which is instead limited to relationships *between* extended projections (or, more precisely, between the lexical item at the base of one projection and the topmost level of another). Instead, the order of elements within an extended projection is an emergent property deriving from the roles the different elements play in the construction of the semantic entity expressed by the constituent, as in Borer (2005a,b), Ramchand (2008, 2018), Ramchand and Svenonius (2014), Wiltschko (2014), Svenonius (2016).

In this kind of analysis, the position of a head in an extended projection will be determined by the role it plays in building up the semantic entity the projection denotes. The lexical roots themselves form the bottom of the extended projection and contribute a meaning that is generally quite generalized and abstract (see, e.g., Halle and Marantz 1993; Borer 2005a,b;

Ramchand 2008, 2018). The heads in the functional sequence immediately dominating the root serve to individuate and quantify this abstract meaning such that it can be used to describe particular entities, and the heads at the top of the functional sequence connect these entities to referents in the world or the discourse. For instance, DP denotations are generally claimed to start with the general, abstract meaning of a nominal root, which gets delineated and quantified by such elements as plural markers, classifiers and numerals, and become associated with real-world entities through articles and demonstratives (e.g., Zamparelli 2000; Borer 2005a; Laenzlinger 2005, 2010; Svenonius 2008; Wiltschko 2014). Given the roles they play in this process, functional heads such as D and Num need not be specified as selecting certain heads, nor even as part of the nominal functional projection, since this follows from their semantics. I assume the same holds for the verbal/clausal extended projections as well (see, e.g., Ernst 2002; Borer 2005b; Ramchand 2008, 2018; Laenzlinger 2010; Ramchand and Svenonius 2014).

Thus, the content and organization of heads within extended projections can be accounted for in semantic terms without the need for the kind of selection proposed in Section 2.4.2, which is instead active in selectional relationships between extended projections. The current proposal accounts for regularities in the functional sequence within and across languages, yet allows room for variation, since there is not necessarily one single way that a given kind of extended projection can be built up. While I will not be presenting here a fully worked-out theory of extended projections from which the functional sequences follow automatically (although see Svenonius 2016 for a proposal for how extended projections can "emerge" through acquisition), I assume that the account proposed here is on the right track and that a more complete theory is possible.

2.5 Conclusion and discussion

In this chapter I have discussed the development of the notion of selection, in particular the work of Grimshaw (1979, 1981) and Pesetsky (1982, 1991), which proposes three types of selection: c-selection for syntactic categories and features, s-selection for semantic properties and types, and l-selection for lexical items. I then proposed a theory of extended projections in which different regions of the functional sequence can be associated with different types of semantic entities (as with the clausal spine) or one single type (as with the nominal spine), forming domains that line up with phases, namely CP, AspP, and DP, along with a theory of selection stated in terms of these semantic domains rather than syntactic categories or features. Taken together, these proposals account for a selectional asymmetry between clausal and nominal complements noted by Bruening (2009) and Bruening et al. (2018) without syntactic selection and without abandoning the DP Hypothesis. This suggests that a purely semantic notion of selection is on the right track.

As noted in Chapter 1, the goal in this thesis of providing a semantic account for selectional properties (rather than specifying them as features in lexical entries) requires a two-pronged approach. I must show both that the properties selected for are semantic, not syntactic in nature, and that the elements that a given predicate will select are predictable from that predicate's semantic properties. This chapter was mostly intended as a proof-of-concept for the first part of the problem, showing that s-selection can provide a natural solution to locality problems that are difficult to explain in terms of c-selection. However, in Section 2.2.3 I presented research by Nathan (2006) showing that whether or not predicates will take concealed questions as complements is predictable based on the semantics of the predicate, and does not need to be specified in the predicates' lexical entries, contra Grimshaw (1979, 1981) and Pesetsky (1982, 1991), thus providing a solution to the second part of the problem of selection for a small set of predicates. In the next two chapters I extend this kind of analysis to a larger set of predicates in a pair of case studies, turning first to the case of

eat and *devour* and similar predicates in Chapter 3, and then in Chapter 4 to the puzzle of selection for particular lexical items.

Chapter 3

Semantic Conditioning of Argument Omission

3.1 Introduction

In this chapter and the next we turn to how the semantics of a selecting predicate determines its selectional restrictions. Here I focus on a puzzle in c-selection that has motivated the claim that c-selectional properties cannot be predicated from the selecting predicate's semantics, namely the availability of the Unspecified Object Alternation (UOA).[1] It has long been known that there are pairs of near-synonymous transitive verbs, like *eat* and *devour*, of which one can drop its object and the other cannot:

(1) a. John ate (some pizza).
    b. John devoured *(some pizza).

Of course, these two verbs are not true synonyms; *eat* and *devour* have a clear difference in meaning. The difference is one of hyponymy; the set of events described by *devour* is a subset of that described by *eat*. The meaning of *devour*, then, contains the meaning of *eat*, plus

[1] This terminology is due to Levin (1993).

some further specification of the way the eating is done. However, this conceptual difference between the meanings of the two verbs is not the kind of semantic content that is typically seen as determining argument structure; it is not clear how a semantic difference affecting how the subject consumes their food could affect the availability of object omission. This is what is meant by "near-synonymy" in this case. The fact that these two verbs differ in argument structure despite the lack of obviously-relevant semantic differences is taken by some (e.g., Jackendoff 2002) as evidence that argument structure is not reducible to semantics, and that specification of syntactic properties in the lexicon is unavoidable. However, here I show that there is a crucial difference between *eat* and *devour* that determines whether or not UOA is available: *eat* specifies only a Manner of acting, while *devour* specifies both a Manner and a Result (in roughly the sense of Rappaport Hovav and Levin 2010), namely that the object must be completely consumed in an event of devouring (a difference noted by Smollett 2005 and Piñón 2008). I claim that Manner and Result, as components of verb meaning, have syntactic consequences for a certain set of verbs, constraining which arguments must be overtly present in the syntax.

3.1.1 The Unspecified Object Alternation and syntactic theory

The relevance of UOA, and specifically the contrast between *eat* and *devour*, to the status of c-selection in the grammar is well known to linguists, but appears to be explicitly discussed relatively rarely in published work. One notable exception is Jackendoff (2002), an exposition of Jackendoff's theory of Conceptual Semantics, in which the encoding of argument structures and selectional features in lexical entries plays an important role in the generation of clauses. Jackendoff defends the use of such features in reference to UOA, claiming that it cannot be accounted for by the semantics of the lexical items, and must therefore be arbitrarily specified in verbs' lexical entries. Here I outline Jackendoff's views on UOA, and point out some shortcomings of his approach.

The model of Conceptual Semantics, presented in Jackendoff (1990, 1991, 1996, 2002) and elsewhere, is part of a framework of parallel architecture that is based on the idea that different elements of the grammar are located in different cognitive modules, which are connected through various linking rules and interface constraints. An item's lexical entry consists of associations between information in different modules that are linked through coindexing. The lexical entry of a verb includes its argument structure, which lists the different arguments that it takes, as well as information on whether or not each argument is obligatorily expressed in the syntax. So, the argument structures of the verbs *devour*, *eat*, and *swallow* are as in (2) (adapted from Jackendoff 2002, p. 143):

(2) a. [DEVOUR (X_{obl}, Y_{obl})]

b. [EAT (X_{obl}, Y)]

c. [SWALLOW (X_{obl}, (Y))]

The argument structures of *eat* and *devour* differ only in that the second argument of *eat* is not marked as obligatory. Thus, *eat* always has two semantic arguments, as even when it is used intransitively, there is understood to be some entity being eaten. This is contrasted with *swallow*, where the second semantic argument itself is optional; arguably, there does not have to be any entity being swallowed. The precise grammatical functions and syntactic realizations of the different arguments are determined by linking hierarchies and other constraints on the syntax-semantics interface.

Jackendoff (2002, p. 134, fn. 15) explicitly argues that the differences between these verb classes is, in fact, essentially due to arbitrary lexical specifications of the verbs. He notes that it is tempting to argue that whether a verb's object will be obligatory or optional depends on the specificity of the verb's semantics, so that verbs with a narrow meaning (like *devour*) will require an object, while for verbs with a wider meaning (like *eat*), the object will be optional. Jackendoff counterexemplifies this claim with pairs of verbs like *serve* and *give*, where the former may drop its indirect object while the latter may not, despite the fact that

serve seems like a more specific counterpart to *give*. Jackendoff also raises the examples of *juggle (six balls)* and *flirt (with Kim)*, stating that these verbs have highly specific semantics yet may drop arguments. However, since the criteria by which the specificity of semantics is determined are not laid out, it is difficult to say whether a verb should be considered "too specific" for this alternation without another verb to compare it to. Furthermore, even if Jackendoff is correct in saying that there is no connection between the specificity of a verb's denotation and the availability of UOA, that does not rule out the possibility that there are other semantic criteria that influence the availability of this alternation, thus rendering the argument structures non-arbitrary.

Resnik (1993) proposes a different way of predicting whether or not an verb will allow its object to be dropped, involving the inferability of properties of the object. In brief, if the properties of an object are easily inferred (i.e., there are not many different kinds or classes of things the verb can take as an object), the object is more likely to be optional, while if the objects' properties are not easily inferred, they will be obligatory. Glass (2014) extends this kind of analysis to *eat* and *devour*, showing that while the complement of *eat* is some kind of food in a majority of cases (in 80% of cases in CoCA, the corpus she used), the complement of *devour* is some metaphorical or non-food substance (e.g., *devour autobiographies*) more often, and denotes some kind of food only 14% of the time. Thus, *eat* allows UOA, and *devour* does not. However, while this kind of analysis works much of the time, Resnik notes that it does have its exceptions in both directions. Furthermore, while the omissibility of objects is a largely categorical matter (in relatively neutral contexts at least; see Section 3.1.2), in that a verb can generally either drop its object or not, the inferability scores in this kind of analysis are gradable; thus, it is difficult to say why the cutoff point where objects become obligatory is at a certain level of inferability, rather than some higher or lower level. Therefore, I will not discuss Resnik and Glass's analysis of *eat* and *devour* further, although it may turn out upon further investigation to account for pragmatic differences in the likelihood or frequency of object omission among the non-Result verbs that are unexplained on the current account.

An observation that suggests that the obligatoriness of arguments is derived from verb semantics in a principled, non-arbitrary way is that the translation equivalents of *eat* and *devour* in other languages seem to be consistent in the obligatoriness of their objects. While I do not attempt to do a proper crosslinguistic survey here, a small sample of three languages shows consistent transitivity properties:[2]

(3) *French*

a. Jean a mangé (la pizza).
John has eaten the pizza
'John ate the pizza.'

b. Jean a dévoré *(la pizza).
John has devoured the pizza
'John devoured the pizza.'

(4) *Dutch*

a. Jan at (de strudel).
John ate the strudel
'John ate the strudel.'

b. Jan verslond *(de strudel).
John devoured the strudel
'John devoured the strudel.'

(5) *Arabic*

a. jõn ʔakal(a) (ʔal-xubzah)
John ate the-pita.SG-FM
'John ate the pita.'[3]

b. jõn ʔiltahama *(ʔal-xubzah)
John devoured the-pita.SG-FM
'John devoured the pita.'

If this correspondence between meaning and argument structure holds across languages, as the evidence in (3)-(5) would suggest, then this provides evidence that the possibility of

[2]Thanks to Basile Roussel, Marieke Woensdregt, and Saleh Al-Qahtani for their grammaticality judgements.
[3]The final vowel in *ʔakala* 'ate' is absent when the object is omitted.

UOA is not arbitrary, and is predictable from the semantics. If on the other hand it were an arbitrary lexical property, this kind of consistency even in a small sample of languages would be unexpected.

3.1.2 Scope of the phenomenon

While the above discussion has implied that the object of *devour* and similar verbs can never be omitted, this is not strictly true. As has been discussed by Goldberg (2001, 2005); Cummins and Roberge (2004); Mittwoch (2005); Glass (2014); Levin and Rappaport Hovav (2014), among others, there are examples in which verbs that normally require an explicit object, like *devour*, can acceptably appear without an object. For the most part, this is only possible in certain kinds of contexts. Some of the relevant contexts are given below along with representative examples adapted from Glass 2014, p. 123; most of the contexts and examples are originally from Goldberg 2001):

(6) a. Tigers only **kill** at night. *generic*

b. Dresses I would **murder** for. *modal*

c. Scarface **killed** again. *repeated action*

d. The singer always aimed to **please**/**impress**. *infinitive*

e. Why would they give this creep a light prison term? He **murdered**!! *emphasis*

f. He **burglarized**, but she **murdered**! *contrastive focus*

Similar sets of contexts are suggested by the other authors cited above. In each of these contexts, the speaker is emphasizing the action denoted by the verb itself, while the themes or patients are backgrounded. The exact reason why these contexts, and not others, should facilitate the omission of objects that are otherwise obligatory is not clear (although various insightful proposals are made by the authors cited above); however, given the analysis to be developed in this chapter, it is perhaps not surprising that they are all contexts in which the

resultant state holding of the theme of the event is less relevant than the nature of the action itself.

In contrast, Levin and Rappaport Hovav (2014) point out that with UOA verbs like *eat*, such a special context is not required for the object to be omitted; the UOA is freely available in "out-of-the-blue" contexts. Thus, while it is a simplification to state that the UOA is entirely unavailable for *devour*-type verbs, a categorical difference exists between verbs like *eat* and those like *devour*: the UOA is freely available for the former, while only available in a restricted set of contexts for the latter. Because of this, I will set aside examples like those in (6) in the ensuing discussion, although admittedly a full account of the UOA must be able to explain these data as well.

3.1.3 Proposal and roadmap

Having established the scope of the problem and some theoretical background, I now turn to my proposal and analysis. I claim that there is a semantic reason why verbs like *eat* allow UOA and verbs like *devour* do not, and it has to do with whether or not the verbs express the meaning components of Manner and Result, in roughly the sense of Rappaport Hovav and Levin (2010). Part of the meaning of *eat* is that the event denoted is undertaken by an agentive causer. According to the theory that I develop below, this means that it is a Manner verb. However, *eat* does not entail that its object has maximally undergone a scalar change (in a sense to be made clear in Section 3.3) – it is not a Result verb. On the other hand, while *devour*, like *eat*, expresses Manner, it also expresses a Result: it entails that, at the end of the event, the full extent of the object is in a state of having been consumed. I claim that if a verb expresses Manner, then its agentive subject must be overtly present in the syntax, while if a verb expresses Result, then the argument of which the result state is predicated must be present. Therefore, since *eat* expresses only Manner, then only the subject is necessary in the sentence, and the object can be dropped freely. However, a verb expressing both Manner and Result, like *devour*, requires both arguments to be present.

I begin in Section 3.2 by establishing some properties of the omitted objects in UOA sentences, concluding that they are not syntactically present as covert elements. Next, I move to my analysis. In Section 3.3 I introduce the notions of Manner and Result as components of meaning that impose restrictions on argument realization, and show how this proposal relates to similar claims in the literature. In Section 3.4 I apply this analysis of Manner and Result to *eat* and *devour*, showing that the former is a Manner verb and the latter is a Manner-Result verb; I then discuss some theoretical consequences of this analysis. In Section 3.5, I apply this analysis to a wider set of verbs, completing the typology by showing that there are dynamic verbs, like *clean*, which are specified for neither Manner and Result and therefore may express either. I also show that other verbs for which UOA is not available pattern with *devour* as Manner-Result verbs. In section 3.6 I provide the conclusion.

3.2 Properties of omitted objects

In this section I will present some properties of the omitted objects. I show that they are interpreted as indefinite masses, corresponding to the "typical" object of the verb; however, there is no evidence that they are present in the syntax. This suggests that it is really an instance of omission of an argument,[4] rather than the presence of a null pronoun or variable present in the syntax.

3.2.1 Interpretation of omitted objects

The understood object of verb that has undergone UOA is generally interpreted as a "typical" object of the verb, in some sense. Chomsky (1986) cites an observation by Howard Lasnik that the meaning of the intransitive use of *eat* is somewhat different from the transitive use, and is specifically something more like *dine*; Chomsky notes that "[o]ne can say 'John ate his

[4]Since there is no evidence that the missing object is present at any point of the derivation, I will treat this as omission; thus, it contrasts with valency-reducing operations such as the passive, which are better characterized as instances of deletion. See Footnote 11 for further discussion.

shoe,' but 'John ate' cannot be understood to include this case" (p. 8). Similarly, Fillmore (1986) notes that while one can, and often does, bake a number of foods besides typical "baked goods" such as breads and pastries, including potatoes and hams, *John is baking* generally cannot be taken to mean John was baking, for example, potatoes. Fillmore also observes that the intransitive form of *drink* specifically denotes consumption of an alcoholic beverage. However, these interpretations can be overridden, as in the following examples (Fillmore 1986, pp. 97, 106; the latter is attributed to Michael Silverstein, p.c.):

(7) a. When my tongue was paralyzed I couldn't eat or drink.

b. As long as we're baking anyway, we may as well do up the ham now too.

Therefore, these restrictions on the interpretations on the understood objects of UOA verbs are tendencies at best; this aspect of their meaning will not be discussed in depth in this chapter.

The understood objects of verbs that have undergone UOA are interpreted as indefinite masses or plurals. For their indefinite status, I give evidence from AnderBois (2012). AnderBois notes that the understood objects may not be coreferential with any previous discourse referents. This is shown in the following examples (adapted from AnderBois 2012, p. 44; throughout this section I note the putative positions of the understood objects with an underscore):[5]

[5]Referential null objects like those in (i) do occasionally appear in English, though they seem to be restricted to certain special contexts and registers. For example, the sentence *I brought in the sandwich, and Jill ate* is most readily interpreted as meaning Jill brought the same sandwich that I brought (Rob Truswell, p.c.). This is even possible with verbs like *devour*, as shown in the following example: *She snatched one of Brianna's stuffed mushrooms from a plate and devoured* (Nora Roberts *Born in Shame*, chapter 15, p. 232. 1996 Jove Books, New York). However, this appears to be largely limited to literary contexts, in which the author takes liberties with the grammar for artistic effect, rather than reflecting the ordinary way in which these verbs can be used. This kind of construction is also frequently used with cooking verbs (for which UOA is normally unavailable) in recipes; thanks to Diane Massam (p.c.) for examples and discussion of this point. As with the restricted contexts discussed in Section 3.1.2, I will set these aside in this chapter and focus on more neutral contexts, although a full theory of argument realization must allow for such apparent exceptions.

(8) a. A: What happened to my sandwich?
B: #Fido ate ___.
b. A: I see you've got today's *Guardian*.
A: #May I read ___?

The unavailability of coreferential interpretations is a property of indefinite DPs; definite DPs (including personal pronouns) typically corefer with other referents in the discourse. AnderBois also shows evidence from sluicing for the indefinite status of the understood objects. Sluicing is a phenomenon where material in a sentence can be elided due to the presence of an antecedent in the discourse (Ross 1969), as in (9), where the crossed-out material may be elided (adapted from AnderBois 2012, p. 44):

(9) Someone left, but I don't know who ~~left~~.

It has been shown by Chung et al. (1995) that, while weak indefinites may serve as the antecedent of sluiced elements, definite and strongly quantified DPs may not. The understood objects of verbs that have undergone UOA may be the antecedent of sluicing, as shown in (10):

(10) a. Mary is eating, but I don't know what ~~she is eating~~.
b. John cleaned last night, and Michelle is going to find out what ~~he cleaned~~.

Thus, the understood object is interpreted as weakly indefinite.

Evidence from telicity suggests that the understood object of a verb that has undergone UOA is interpreted as a bare plural or mass. It is well known (see Tenny 1994, Jackendoff 1996, Krifka 1998, Borer 2005b, Ramchand 2008, and others) that the telicity of sentences containing UOA verbs depends on the object. If the object is bounded, or quantized,[6] then the sentence is telic (although see Section 3.4.2 and Smollett 2005 for arguments that this telic

[6]A predicate denoting a entity or event x is considered quantized if the same predicate cannot apply to any entity or event y that is a proper subpart of x; thus, *apples* and *water* are not quantized, but *an apple*,

interpretation does not necessarily hold, especially given supporting context, hence the (a) examples are marked as questionable rather than ungrammatical); if not, then the sentence is atelic. This is shown below, using the *in/for X time* test for telicity, where predicates which may be modified with *in X time* are telic, and those which can take *for X time* are atelic:

(11) a. Mary ate a bowl of soup in ten minutes/??for ten minutes.

b. Mary ate soup *in ten minutes/for ten minutes.

(12) a. John cleaned the tables in ten minutes/??for ten minutes.

b. John cleaned tables *in ten minutes/for ten minutes.

With a bounded object, such as a specified amount of a mass as in (11a) or a definite DP as in (12a), the sentence is generally interpreted as telic; when there is an unbounded object such as a bare mass (11b) or plural (12b) the sentence is atelic. Sentences with the same verbs having undergone UOA are atelic, as shown in (13):

(13) Mary ate *in ten minutes/for ten minutes.

(14) John cleaned *in ten minutes/for ten minutes.

Thus, the understood objects of UOA verbs pattern with bare masses and plurals, which are weak indefinites.

Further evidence for a weak indefinite reading of understood objects comes from the analysis of Steedman (2015). Steedman starts with the observation, attributed to Fodor and Fodor (1980), that these understood objects, unlike indefinite pronouns like *something*, always have low scope with respect to other quantifiers in the sentence. The following contrast holds:

(15) a. Everyone ate. $\forall > \exists / \#\exists > \forall$

b. Everyone ate something. $\forall > \exists / \exists > \forall$

three apples, and *two litres of water* are; atelic predicates are not quantized, but telic predicates are; see Krifka (1998) for a more detailed semantic definition.

In (15b), either the universal quantifier in the subject or the existential in the object can take wide scope in the sentence. On the other hand, in (15a), only the universal quantifier can take wide scope; the understood object can only take the lowest scope in the sentence. Steedman provides an analysis for this and related facts which states that these objects are not (overtly or covertly) present in the derivation, but instead the verb *ate* as used in this context is lexically specified as having a weak indefinite object of eating. This analysis will be discussed further in the next subsection, along with other evidence that there is no covert object present in the syntax.

3.2.2 Omitted objects are not present in the syntax

While the understood objects may have the properties just discussed, there is no evidence that they exist as syntactic entities; that is, all evidence suggests that there is no empty pronoun or variable in the object position. Here I discuss some different kinds of empty elements that have been proposed in the literature, and some syntactic diagnostics to test for their presence. Then I apply these tests to UOA verbs.

Various different types of null objects are attested cross-linguistically, and depending on the language, these null objects have different properties and are subject to varying analyses. In some languages, there are null objects which receive a definite interpretation, much like a third-person pronoun in English. This kind of null object is analysed as a variable bound by a null operator in the topic position for Mandarin by Huang (1984) and for European Portuguese by Raposo (1986); Cole (1987) analyses a similar definite null pronoun in Imbabura Quechua as an instance of the null pronoun, *pro*. However, these analyses are not applicable to the English omitted objects in UOA sentences; as shown above, these are indefinite, rather than definite.

As for indefinite null objects, Campos (1986) has claimed that a certain class of null indefinite objects in Spanish are best analyzed as involving an empty category, in this case a bound variable. These are null objects of the sort in (16b) (Campos 1986, p. 354):

(16) a. Compraste café?
'Did you buy coffee?'
b. Sí, compré.
'Yes, I bought (some).'

Campos concludes that these are bound variables; first, they cannot be *pro* by virtue of the simple fact that they are indefinite, and *pro*, like all personal pronouns, is definite. Next, Campos shows that the Spanish null objects pattern with bound variables by various diagnostics. The clearest diagnostic is the Subjacency test, introduced by Raposo (1986). If null objects are variables bound by a silent *wh*-operator at the left edge of the matrix clause, then they are subject to the subjacency constraint, which states that the binding relationship cannot cross more than one bounding node. Bounding nodes include CP and DP, so the prediction is that the null argument cannot appear embedded within a complex DP (i.e., within either a clause embedded in a DP object or a relative clause). This is indeed the case for null indefinite objects in Spanish, as shown in (17c) (adapted from Campos 1986, p. 255), in which the object is embedded in a CP complement to a noun:

(17) a. Juan traerá cerveza a la fiesta?
'Will John bring beer to the party?'
b. Su novia me dijo que traería ∅.
'His girlfriend told me that he would bring (some).'
c. *Existe el rumor de que traerá ∅.
(int.) 'There exists the rumor that he will bring (some).'

Campos also shows that these null arguments obey the Sentential Subject Constraint and the Doubly Filled Comp Constraint; they can appear as subjects of unaccusative intransitives, but not unergative intransitives; and they cannot be found in adjunct clauses. All of these

are expected of variables bound by a null operator. Thus, Campos concludes that the null indefinite objects found in Spanish are bound variables.

While the English null objects under discussion are indefinite, like those that Campos discusses, those in English differ in that are not constrained by Subjacency. Recall that the null bound variable pronouns in Spanish cannot appear in a complex DP, including relative clauses. Omitted objects in English, however, are not bound by this restriction, as shown in (18):

(18) a. The children who ate __ at the bakery have gone home.

b. Anyone who can cook __ is welcome here.

The fact that the omitted objects are not subject to the Subjacency constraint means that they are not A′-bound, which suggests that they are not variables. To my knowledge, they do not fit the properties of any independently diagnosable null elements. This does not preclude the possibility that there is some null item that obligatorily takes a weak indefinite reading and narrow scope.[7] However, it is more parsimonious to assume that the object is not syntactically present at all, and to follow an analysis similar to that in Steedman (2015), in which there is an intransitive reading of *eat* for which the object is interpreted as weak indefinite. This explains the interpretation and syntactic properties of verbs having undergone UOA. However, it still does not explain why this is available for verbs like *eat* but not for *devour*; it is to this problem that I now turn.

[7]Such an analysis is proposed by Cummins and Roberge (2004) and Pérez-Leroux et al. (2008), in which verbs having undergone UOA have a null, bare N complement; this is claimed to be the same kind of null bare N as the cognate objects proposed for unergative verbs by Hale and Keyser (2002). As pointed out by Diane Massam (p.c.), this could explain some similarities between the understood object in UOA verbs and the object in (pseudo-)noun incorporation, including obligatory low scope and the restriction to canonical objects. However, given that a cognate object is often unavailable for the UOA verbs under consideration (e.g., *#John ate a big eat*), it is not clear that the two phenomena should be conflated. It should also be pointed out that the analyses made by Cummins and Roberge (2004) and Pérez-Leroux et al. (2008) appear not to be incompatible with the absence of any null non-referential bare Ns.

However, if it were shown that a null bare N is indeed present in UOA contexts, then an explanation would still be needed for why this element is readily available for verbs like *eat*, but available only in rare contexts (see Section 3.1.2) for verbs like *devour*. Thus, the claims made in this chapter would still be valid, modulo minor changes to the syntax involved.

3.3 Manner, Result, and argument realization

In this section I propose that argument omission is constrained by whether or not the predicate in question expresses Manner or Result, components of lexical meaning defined in terms of the relationships of the core arguments to the event denoted by the predicate. I borrow the terms "Manner" and "Result" from Rappaport Hovav and Levin (1998, 2005, 2010), though I define them in a somewhat different way than they are used in those papers. A verb that expresses Manner requires that its external argument be an Agent of the event; a verb that expresses Result requires that its internal argument undergo some scalar change resulting from the event. When a verb expresses Manner (i.e., it is a "Manner verb"), the agentive subject cannot be omitted or replaced in the sentence, and likewise, when a verb expresses Result (a "Result verb"), the object undergoing the scalar change must be overtly expressed. In this section I begin by discussing Rappaport Hovav and Levin's conception of Manner and Result. Next I move on to the current account, which focuses on the relationship between the event expressed by the verb and certain participants of that event.

3.3.1 Manner and Result in verb meaning

The components of lexical meaning that I refer to as Manner and Result correspond closely to properties of verbal lexical semantics that were introduced in the literature by Rappaport Hovav and Levin (1998, 2005, 2010), from which I borrow the terminology. However, as discussed in this section, there are crucial differences between their characterization of Manner and Result and my own. Here I discuss their conception of Manner and Result, and in the next subsection I summarize my own characterization.

Rappaport Hovav and Levin (1998, 2005) show that Manner and Result are components of the meaning of dynamic verbs, which they find to be in complementary distribution in the lexical semantics of individual verb roots, a claim known as Manner-Result Complementarity. In Rappaport Hovav and Levin (2010), they refine the notions of Manner and Result in

terms of the types of dynamic change they denote in a sentence, scalar for Result verbs and nonscalar for Manner verbs; they explain their (apparent) mutual incompatibility within roots in terms of a Lexicalization Constraint on event schemas.

In the account of Rappaport Hovav and Levin (2010), Result verbs involve a scalar change in some participant, along a scale lexically specified by the verb (or a combination of the verb and direct object). The scales may involve either physical distance or location, as in verbs of directed motion (e.g., *go*, *enter*, *ascend*), or some property, as in change-of-state verbs (e.g., *warm*, *cool*, *break*); see Kennedy (2001), Kennedy and McNally (2005). In either case, the verb may denote change along either a two-point scale or a multiple-point scale, which has consequences for aspectual class (Beavers 2008). Two-point scales are those for which the location or property is either attained or not attained; an example of this in the motion domain is *enter*, and a change-of-state example is *break*. Changes along two-point scales are conceived of as instantaneous, so verbs that denote this kind of scalar change are typically classed as achievements. Multiple-point scales involve intermediate points, and are typically associated with gradable adjectives, or attributes that can have multiple values, such as the motion verb *ascend* (along the scale of height) or the change-of-state verb *warm*. Multiple-point scales can be either closed or open, depending on whether or not there is an end-point to the scale, though this is often contextually determined.[8]

Rappaport Hovav and Levin's (2010) Result verbs can typically undergo the causative alternation; their intransitive variants are what are typically referred to as unaccusative verbs. The event schema they propose is shown in (19), in which the verb root lexicalizes the result-state (Rappaport Hovav and Levin 2010, p. 24):

(19) [[x ACT] CAUSE [y BECOME <*RESULT-STATE*>]]

[8]Further divisions among the Result verbs are made by Beavers and Koontz-Garboden (2017), who propose that some "Result" verbs denote only a scalar change, with no specified result (their "scalar change" verbs) while others do specify a result ("scalar result" verbs). However, this distinction appears to be orthogonal to the matter at hand, as it is more concerned with the scalar component itself, while the distinction that is relevant here involves whether or not the internal argument is maximally affected by the scalar change, regardless of the nature of the scale or the change itself.

The ACT and CAUSE portion of the event is absent in the inchoative form of the verb; the result-state is the scale that is named by the verb root. See Levin and Rappaport Hovav (1998) for more on this type of event schema and the causative alternation.

Manner verbs are characterized by Rappaport Hovav and Levin (2010) as verbs denoting events of nonscalar change, for which the dynamic change cannot be measured along a single scale, but which instead "involve complex changes – that is, a combination of multiple changes" (p. 32). These are the verbs like *exercise*, *scrub*, *jog*, and so on, which denote action in a certain manner, but not necessarily leading to a specific measurable change. Many of these verbs are typically construed as leading to a specific change (e.g., *scrubbing* generally results in the patient becoming clean, and *jogging* generally leads somewhere), and these resulting changes can be overtly expressed as resultative XPs (20) (in satellite-framed languages like English, at least; see Chapter 4 for discussion of cross-linguistic variation in this respect), but they are not lexically entailed by the verb, as they can be denied without contradiction (21):

(20) a. John jogged (to the store).
b. John scrubbed the floor (clean).

(21) a. John jogged in place.
b. John scrubbed the floor, but it didn't get any cleaner.

These verbs cannot undergo the causative alternation, and since they do not encode result state, they are given the simpler event schema in (22):

(22) [x $\text{ACT}_{<MANNER>}$ (y)]

In this schema, the verb root lexicalizes the Manner, which modifies the ACT predicate. The second argument (y) is optionally present, depending on the meaning of the root and the particular context.

Manner and Result, as characterized by Rappaport Hovav and Levin, are not mutually exclusive in the event structures of sentences; this is demonstrated in (20), in which the matrix verb introduces the Manner, and the resultative PP or AP provides the Result. What they claim is that an individual verb root can only express one or the other (see e.g. Levin and Rappaport Hovav 1998, 2013, 2014 for more on this claim). To account for this, they propose the following constraint on event schemas (Rappaport Hovav and Levin 2010, p. 26):

(23) The lexicalization constraint: A root can only be associated with one primitive predicate in an event schema, as either an argument or a modifier.

Thus, by their analysis, a verb root may appear as an argument to a BECOME predicate, as in (19), or it may modify an ACT predicate, as in (22), but it may not appear in both positions at once. If both positions are filled, it must be by separate roots, as in (20).

While Rappaport Hovav and Levin (2010) have characterized Manner and Result as mutually exclusive components of verb meaning, and framed their lexicalization constraint in terms of event templates in order to account for it, counterevidence to the claim of Manner-Result Complementarity has called this analysis into question. Beavers and Koontz-Garboden (2012, 2017) have shown evidence of a group of verbs, including many manner-of-killing and manner-of-cooking verbs, that express both Manner and Result, contrary to the predictions of Rappaport Hovav and Levin; these verbs are discussed below in Section 3.5. In this chapter I propose another class of counterexamples to the claim. Therefore, while I adopt Rappaport Hovav and Levin's terminology of Manner and Result, I will not adopt their analysis. Instead, I link the meaning components to entailments about the roles of different participants in the event.

3.3.2 Realization of Agents and Themes

Here I show that the meaning components of Manner and Result are best characterized not in terms of scalar versus non-scalar change, but instead in terms of the relation certain

participants bear to the event referred to in the sentence. Furthermore, these meaning components impose requirements that certain arguments must be obligatorily expressed. Specifically, verbs with the Manner component entail that there is an Agent acting in a certain manner, and this Agent may not be omitted. Verbs expressing Result entail that there is some Theme, the entirety of which must undergo some scalar change, and this argument may not be omitted. I discuss the two components in turn.

Manner and Agents

I propose a somewhat different characterization of Manner than that of Rappaport Hovav and Levin (2010). Rather than simply defining Manner in terms of non-scalar change (which Rappaport Hovav and Levin essentially characterize as a lack of scalar change; see Beavers and Koontz-Garboden 2012), I propose that the Manner component of verb meaning is an entailment that the event is brought about by a participant acting in a particular manner – that is, an entailment that there is an Agent in the event. This entailment is implicit in Rappaport Hovav and Levin's event-schematic characterization of Manner, shown in (22) above, in which the Manner component modifies an ACT predicate; however, they do not explicitly link Manner to the Agent role. Furthermore, I propose that the entailed Agent must be realized, and may not be omitted.

The link between Manner and agentivity is made by Beavers and Koontz-Garboden (2012), who show that while non-Manner verbs, such as the Result verbs *break* and *shatter*, allow instruments and inanimate causers as subjects, Manner verbs like *scrub* and *brush* do not, as shown by the contrast between (24) and (25) (Beavers and Koontz-Garboden 2012, p. 344):

(24) ✗*Manner*

a. John broke/shattered the vase with a hammer.

b. The hammer broke/shattered the vase.

c. The earthquake broke/shattered the vase.

(25) ✓*Manner*

a. John scrubbed/swept the floor with a stiff brush.

b. #The stiff brush scrubbed/swept the floor.

c. #The earthquake scrubbed/swept the floor.

In (24), the Result verbs *break* and *shatter* allow instruments (*the hammer*) and non-agentive causers (*the earthquake*) as their subjects, while the non-Manner (Result) verbs in (25) do not – the only possible subject for these verbs is a participant acting in a *scrubbing* or *sweeping* manner.

The examples above show that not only is an Agent required in the event denoted by a Manner verb, but this Agent must be expressed as the external argument of a verb. For instance, while the most natural construal of (24b) is one in which the hammer is an Instrument used in the breaking event by some Agent, as in (24a), this construal is unavailable for (25b), despite the fact that a scrubbing or sweeping event with a stiff brush as an instrument is possible as shown in (25a). In other words, not only do the events described by Manner verbs require an Agent (as opposed to a non-agentive causer, as in (24c) and the infelicitous (25c)), this Agent must be expressed as the external argument of the verb. This is in contrast to non-Manner verbs, for which an Agent is not needed in the event, and if it is present in the event (as is implied in (24b)) it need not be expressed as an argument.

A similar observation is made by Reinhart (2002, 2010), who links the property of requiring an Agent to the causative-inchoative alternation. Specifically, she notes that verbs that require an Agent do not undergo this alternation, while verbs that do not require an Agent may do so.[9] This is shown in (26) and (27):

(26) The window opened/broke. ✗*Manner*

[9]Note that not all Result verbs can undergo this alternation; for example, the inchoative form of *kill* is blocked by the verb *die*, and likewise, *kill* blocks the causative form of *die*. However, in Hebrew these two words have the same root (Reinhart 2010), suggesting that the English situation is an accidental property of the lexicon rather than being systematically related to their meanings.

(27) *The floor scrubbed/swept. ✓*Manner*

Reinhart (2010, p. 33) states that "conceptualization of eventualities cannot disregard participants (roles) whose mental state is relevant to the eventuality"; she takes this to mean that, if a verb requires an agentive cause, then the agentive cause must be expressed syntactically. This is related to the characterization of Manner and Result by Rappaport Hovav and Levin (2010) discussed above in Section 3.3.1, in which Manner verbs do not undergo the causative-inchoative alternation by virtue of their event structure (22), while Result (i.e., non-Manner) verbs with the structure in (19) above can do so by removing the upper part of the structure, namely the ACT and CAUSE predicates.

Thus, Manner can be characterized as the requirement that there is an Agent, or a participant acting in a certain manner, in the event structure. Furthermore, this Agent must be expressed as the external argument of the verb, and may not be omitted, as shown in (27), or replaced with a non-agentive external argument, as shown in (25). This allows a more precise and testable definition of Manner than that of Rappaport Hovav and Levin (2010) as non-scalar change; rather than involving a change that cannot be characterized as scalar, it involves entailments about the role one of the participants plays in the event, and is made testable by the fact that this participant must be expressed as the external argument.

Before going further, a quick note is in order on what exactly is meant by "agency" here. The definition typically given to an agentive subject is one in possession of a mental state, acting volitionally. However, this definition is somewhat too restrictive. For example, machines are often treated in language as though they had volition, as in (28):

(28) a. The printer drew a circle.

b. The scanner read the bar code.

In addition, inanimate objects and natural forces can occasionally be the subject of Manner verbs, as in (29):

(29) a. The kettle whistled.

b. The wind moaned.

This has caused some authors (e.g., Pietroski 2000; Folli and Harley 2008; Copley and Harley 2015) to extend the definition of agentive causation to include any case where the force causing the event is spontaneously generated by inherent properties of the causing entity itself, and sustained throughout the event. This notion is referred to by Folli and Harley (2008) as *teleological capability*. This includes computers and other artifacts that act "spontaneously", and certain other inanimate objects that are seemingly capable of generating energy on their own, "as if by 'magic'" (Copley and Harley 2015, p. 138). It excludes animate entities acting non-volitionally or by accident, instruments or natural forces that participate only in the initiation of an event, and circumstances leading to the initiation of an event.

Result and Themes

The definition of Result that I adopt here is closer to that of Rappaport Hovav and Levin (2010) than that which I adopt for Manner. Like Rappaport Hovav and Levin, I take Manner to be the entailment that the event involves some scalar change. However, I take this further and connect the scalar change to a participant in the event, namely the Theme argument, such that a Result verb entails that the Theme argument undergoes a scalar change in its entirety. Furthermore, as with the Agent entailed by a Manner verb, this Theme must be realized as a syntactic argument of a verb, in this case the internal argument.

When I claim that the Theme must undergo a scalar change "in its entirety", I do not mean that the change must reach some specified endpoint or that the event must be telic; instead, the change (to whatever extent it occurs) must affect the entire entity denoted by the Theme. To illustrate, consider (30).

(30) The soup cooled.

For this sentence to be true, the entire quantity of soup referred to by the subject must cool to some degree; if only part of the soup cools, while the rest stays warm, the sentence is not true. This is the case regardless of how much the soup actually cools by, which depends on the context. See Section 3.4.2 for further discussion of this distinction, which is crucial to the role of the Result component in verbs of consumption and other incremental theme verbs.

That the Theme of a scalar change must be syntactically present, and cannot be omitted, has been observed by Rappaport Hovav and Levin (2001), Rappaport Hovav (2008), and Beavers and Koontz-Garboden (2012). For instance, Rappaport Hovav (2008, p. 24) notes that "scales require that the participant whose property is measured by them be overtly realized". Thus, Result verbs cannot occur in a number of syntactic constructions in which the internal argument is omitted, or replaced with some argument that is not thematically related to the main verb. This includes UOA (which has been discussed in detail above), *out*-prefixation, and resultative XPs predicated of a "non-selected" object. Each of these is possible for non-Result verbs, and impossible for Result verbs. This can be seen for UOA by the contrast in (31):

(31) a. All last night, John scrubbed. ✗*Result*

b. *All last night, John broke. ✓*Result*

Out-prefixation is a construction in which the normal object of the verb is replaced by an individual not directly involved in the event denoted by the verb root:

(32) a. John outscrubbed the other cleaners. ✗*Result*

b. *John outbroke the other clumsy children. ✓*Result*

The last construction involves the addition of a resultative XP. These are permitted for either Result or non-Result verbs, so long as the object is "selected" by the verb, as in (33), where

the floor is predicated of both *scrub* and *clean*, and *the window* is predicated of both *break* and *to pieces*:

(33) a. John scrubbed the floor clean.

b. John broke the window to pieces.

However, in the case of a resultative XP with a "non-selected" object, the object is predicated of the resultative XP, but not of the verb itself; thus, in the intended readings of (34), *his knees* are not themselves *scrubbed*, and *his knuckles* are not *broken*, but in both cases they become *sore* as a result of the event denoted by the main verb:

(34) a. John scrubbed his knees sore. ✗*Result*

b. *John broke his knuckles sore. ✓*Result*

These examples show that Result verbs are not possible in constructions where the Theme (the entity undergoing the entailed scalar change) is omitted.

Thus, the characterization of Result that I adopt here is similar to that of Rappaport Hovav and Levin (2010) in that it involves the notion of scalar change. However, there is more emphasis on the relationship between the event and the argument undergoing that change: Result verbs denote an event in which the full extent of some argument (the Theme) undergoes a scalar change (in a sense that I will clarify in Section 3.4.2). Furthermore, this argument must be syntactically realized, and may not be omitted.

It should be added that there are grammatical contexts in which the entailment of scalar change can be overridden. The most well-known example of this is referred to as the "imperfective paradox" (Dowty 1979; see Copley and Harley 2015 for recent discussion and analysis): in imperfective and progressive aspects, the usual entailment of a result state in a given event can be overridden, as shown in the following contrast (Copley and Harley 2015, p. 105):

(35) a. #Mary painted the dresser black, but she didn't finish.

b. Mary was painting the dresser black, but she didn't finish.

Ordinarily, the presence of the resultative predicate means that the theme ends up painted black at the end of the event, and so the denial of such a result leads to a contradiction, as in (35a). However, in the progressive aspect, no such result is entailed, and so the resulting state can be denied without contradiction (35b). While a full understanding of the imperfective paradox is ultimately needed in order to properly characterize the syntax and semantics of result states, the phenomenon is outside the scope of this thesis, and so such examples will be set aside.

Discussion

Here I have proposed a characterization of Manner and Result that is similar to that of Rappaport Hovav and Levin (2010) in many ways, but differs in some details. Instead of being defined in terms of whether the change described by the event is scalar or not, it involves the relationship between the event and certain participants therein: a Manner verb has an Agent acting in some manner, and a Result verb has a Theme which undergoes a scalar change. In each case, the argument in question must be syntactically present in the sentence, and may not be omitted.[10] The reason why these components of verb meaning impose such

[10]The definition of Manner and Result taken here is reminiscent of the *agent-manner* and *patient-manner* features proposed by Hale and Keyser (2002) in order to account for the following contrast (pp. 35–36):

(i) a. Mud splashed on the wall.
(cf. The cars splashed mud on the wall.)
b. Ice cream dripped on the sidewalk.
(cf. The child dripped ice cream on the sidewalk.)
c. Water spilled on the floor.
(cf. The puppy spilled water on the floor.)

(ii) a. *Mud smeared on the wall.
(cf. They smeared mud on the wall.)
b. *White pipeclay daubed on the dancers' bodies.
(cf. The kurdungurlu daubed white pipeclay on the dancers' bodies.)
c. *Quarter moons stamped on the leather.
(cf. The saddlemaker stamped quarter moons on the leather.)

requirements on argument realization is not entirely clear. However, if the two are construed as corresponding to separate subparts of the event structure, as in Rappaport Hovav and Levin (1998, 2001, 2010) (a "causing" subevent involving an Agent acting in a certain way, and a "result" subevent involving a Theme undergoing some scalar change), then the correlations between Manner and Result and argument omission can be seen as consequences of the Argument-per-Subevent Condition of Rappaport Hovav and Levin (2001, p. 779): "There must be at least one argument XP in the syntax per subevent in the event structure." But still, the exact explanation for this condition, and whether it should be seen as a part of the grammar or of human cognition in general, is not entirely clear.

Whatever the ultimate reason for the correlation between Manner and Result and the obligatory realization of arguments, it amounts to a semantic selectional requirement that holds at the point in the derivation where syntactic material is transferred to the semantic interface, according to the account proposed for selection in Chapter 2, Section 2.4.2. In this case, the constituent being transferred is the lower phase of the clause (AspP), which includes the verb itself along with its associated functional material, including heads responsible for introducing arguments and building event structure (see discussion of the event domain in Chapter 2, Section 2.4). In keeping with the assumption that the syntax builds structures freely and any ungrammaticality (or unacceptability) comes from incoherence at the interfaces rather than a "crash" in the derivation (see, e.g., Chomsky et al. 2017), I propose that the selectional restrictions apply to the interpretation of the phase as a whole, rather than to any

Hale and Keyser claim that the verbs in (i) have somewhere in their lexical entry "an adverbial semantic 'feature' that identifies the physical motion, distribution, dispersal, or attitude" (p. 35) of the patient argument, and dub these the patient-manner verbs. The verbs in (ii), on the other hand, include an adverbial feature that defines actions by an Agent that are necessary to perform the action named by the verb; these are the agent-manner verbs.

Hale and Keyser characterize these features as indices that must be coindexed with one or the other of the core arguments: the patient-manner feature must be coindexed with the nearest argument (the internal argument), while the agent-manner feature must be coindexed with the second-nearest (the external argument). These coindexation requirements result in ungrammaticality when that argument is omitted; therefore, the Agent can be omitted with patient-manner verbs (i), but not with agent-manner verbs (ii). While I do not commit to a syntactic analysis along these lines, it is highly likely that Hale and Keyser's agent-manner feature corresponds with the Manner component as characterized here, and patient-manner with Result.

particular heads or roots. In other words, at the semantic interface, a constituent denoting an event interpreted as having the Result component will necessarily have the necessary functional material to introduce an agentive external argument (i.e., some form of v or Voice, depending on the analysis), and likewise for Result and themes.[11] Thus, the syntactic facts of selection can be accounted for without any need for c-selectional features (arbitrary or otherwise) in any lexical entries.

Now that Manner and Result are characterized in terms of agentivity and themehood in the event, rather than scalar versus nonscalar change, one can raise the question of what the properties of a verb with both of these meaning components would be. The event described by such a verb would require an Agent to act in a certain manner to bring it about, and would result in a scalar change affecting another participant. Syntactically, such a verb would not allow the omission of either the external argument or the internal argument; both would need to be realized in a sentence containing the verb. Rappaport Hovav and Levin (2010) claim that no such verbs exist, and that Manner-Result Complementarity holds (which they explain using the Lexicalizaton Constraint). However, in the next section, I show that *devour* is just such a verb.

3.4 Deriving the selectional difference between *eat* and *devour*

In the previous section I proposed an analysis of Manner and Result in terms of whether the event described by the verb requires an Agent acting in a certain way and a Theme affected by a scalar change (respectively). Furthermore, these meaning components affect the omissibility of arguments, such that Manner verbs require that the Agent be realized, and Result verbs

[11]This explains how the obligatory arguments can be deleted due to morphosyntactic argument structure alternation operations such as the passive: what is required for a Manner interpretation is a syntactic configuration associated with agentive external arguments; it is this kind of configuration that feeds the passive operation. Similar points can be made for other such operations. Thus, the possibility of such operations is expected regardless of the presence of Manner and Result.

require that the Theme be realized. In this section I use these meaning components to derive the difference between *eat* and *devour* presented in the introduction: *eat* expresses Manner, but not Result, meaning that the Agent (the one doing the consuming) must be realized but the Theme (the thing being consumed) may be omitted. In contrast, *devour* expresses both Manner and Result, so both the Agent and the Theme are obligatory. Thus, I show that the difference between them does not need to be stipulated as selectional features, but is instead derivable from their semantics. A further consequence of this is that *devour* provides a counterexample to the claim of Manner-Result Complementarity (Rappaport Hovav and Levin 2010).

3.4.1 Manner in *eat* and *devour*

Both *eat* and *devour* encode the Manner component in their lexical semantics. I will demonstrate this using the constructions discussed above in Section 3.3.2, as well as by showing that the interpretation of these verbs in sentences with the adverb *accidentally* patterns with Manner verbs, rather than non-Manner verbs. First, as shown in (24) and (25) above, the external argument of Manner verbs must be an Agent, and cannot be an instrument or a non-agentive causer. This can be seen in the following examples:

(36) Max/*this spoon/*hunger ate/devoured the soup.

(37) a. ??The rust/*years of neglect ate the metal of the car.

b. ??The spilled acid/*the industrial accident resulting in an acid spill devoured the metal of the car.

Note that, while *the rust* and *the spilled acid* may count as agentive in the sense of teleological capability (Folli and Harley 2008), as discussed in Section 3.3.2, instruments (such as *this spoon*) and circumstances (such as *hunger*, *years of neglect*, or *the industrial accident resulting*

in an acid spill) do not. Furthermore, as expected for Manner verbs, neither *eat* nor *devour* can appear in an inchoative form, with the Theme in subject position:

(38) *The soup ate/devoured.

Therefore, in terms of argument realization, both verbs are Manner verbs.

The status of these verbs as Manner verbs is reinforced by the fact that, in the presence of an animate subject, the subject must be acting agentively. Recall that the Manner component is characterized as the lexical requirement that the event described must be brought about by an Agent acting in a certain way. Thus, for *eat* and *devour*, the Agent must be performing actions specific to eating and devouring events: consuming the Theme through the mouth (with the additional requirement for *devour* that the event be done particularly quickly or voraciously), and doing so of their own volition. This is in contrast to non-Manner verbs, for which the way in which the external argument (if present) brings about the event is not specified, and may not be deliberate. This contrast can be seen in the possible interpretations of the following examples:

(39) a. John accidentally broke the glass. ✗*Manner*

b. #John accidentally scrubbed the floor. ✓*Manner*

In (39a), there are (at least) three possible interpretations: (i) John meant to break something else, but accidentally broke the glass instead; (ii) John was interacting with the glass in some way that accidentally led to its breaking; (iii) John was performing some unrelated action which accidentally led to the glass breaking. In (39b), on the other hand, only the first two kinds of interpretation are available, with John either doing some (deliberate) scrubbing that accidentally affected the floor instead of something else, or John doing something with the floor that accidentally involved a scrubbing action; there is no possible interpretation in which the entire action is an accident. This is because Manner verbs like *scrub* denote

actions that can only come about through agentive action. By this diagnostic, too, *eat* and *devour* both pattern as Manner verbs, as can be seen in (40) and (41):

(40) #John accidentally ate some mushroom soup.

(41) #John accidentally devoured some mushroom soup.

In both of these sentences, either John was deliberately consuming something, which accidentally happened to be that particular soup, or John meant to do something else with the soup (e.g., taste it and spit it back out), but accidentally ended up consuming it. They cannot mean that he was doing some unrelated activity that accidentally resulted in the consumption of mushroom soup. This, too, suggests that *eat* and *devour* are both Manner verbs.

3.4.2 Result in *eat* and *devour*

Here I show that *devour* has a Result component in its lexical semantics, but *eat* does not. I show this first using the constructions discussed in Section 3.3.2 above. However, since these constructions all involve the omission of the Theme argument, and since it is the availability of argument omission that is the phenomenon under consideration in this chapter, I will also provide further semantic evidence of the contrast, which shows that the internal argument of *devour* in its entirety must undergo a scalar change (i.e., the entirety of the Theme must be devoured), while that of *eat* does not necessarily do so.

In Section 3.3.2 I demonstrated that verbs that do not have the Result component allow their Theme arguments to be omitted in various constructions, while result verbs do not. Here I show that *eat* can occur in these constructions, while *devour* cannot. Of course, we have already seen that this is the case for the UOA – that is the very contrast that is the topic of this chapter. The contrast holds for *out*-prefixation as well, as seen in the following contrast:

(42) John out-ate his siblings.

(43) *John out-devoured his siblings.

Furthermore, *eat* can take a resultative XP predicated by a non-selected argument, while *devour* cannot, as shown in (44) and (45):

(44) John ate the restaurant out of business.

(45) #The lion devoured the zoo out of business.

In (44), the most plausible interpretation is not that John ate the restaurant itself, but that he ate so much food that the restaurant could not afford to feed him and consequently went out of business. In (45), such a reading is not available; if there is a possible interpretation, it is one in which the lion devoured the zoo itself, in which case *the zoo* is not a non-selected argument. This shows that the contrast between *eat* and *devour* does not simply involve the presence or absence of UOA, but should instead be characterized as *eat* allowing the Theme argument to be omitted in general, which *devour* does not allow. This is consistent with a scenario in which *devour* is a Result verb, and *eat* is not.

To support this conclusion, it is necessary to show that events of devouring necessarily involve the Theme being consumed in its entirely, while eating events do not entail complete consumption of the Theme. First, it is necessary to clarify what is meant by "in its entirety" in this context, a clarification I deferred when discussing the Result component in Section 3.3.2. When a verb has the Result component, the requirement is that the entity referred to by the Theme be maximally affected by the event in question – in other words, there is no part of the entity that could be affected, but is not. This is a relatively straightforward assumption for change-of-state verbs such as those discussed in Section 3.3.2; consider (30), repeated here as (46), and (47):

(46) The soup cooled.

(47) John's face reddened.

As discussed above, (46) is true iff the entire quantity of soup in question cooled. In contrast, (47) may be true if there are parts of John's face that did not become red. For example, in a scenario where the skin of John's face turned red, but his eyes and facial hair did not, then it is not technically true that his *entire* face reddened. However, given our world knowledge of faces and reddening, such as the fact that skin reddens readily while other body parts do not, one can safely consider the non-red parts to be generally irrelevant to reddening events, and so (47) is still true. On the other hand, if only part of his facial skin turned red but the rest did not (e.g., if his cheeks reddened but his nose, forehead, and chin stayed their normal colour), then one would be less inclined to consider (47) to be true. In other words, the event of reddening affects the maximal part of John's face that participates in reddening events, given our knowledge of faces and reddening, but may leave the rest unaffected.

This distinction becomes more relevant with verbs of consumption (e.g., *eat*, *devour*, and *read*) and creation (e.g., *build*, *write*). Unlike with change-of-state verbs, in which the (maximal relevant part of the) Theme generally gradually undergoes some change at the same time (e.g., in (46), the entirety of the soup becomes cool together, and in (47), the relevant parts of the face become red at the same time), with verbs of consumption and creation (Tenny's 1994 *incremental theme verbs*), the event generally passes through the Theme entity gradually. That is, with events of consumption, the Theme will generally get more and more consumed as the event progresses, and likewise for verbs of creation (see Tenny 1994 and Krifka 1998 for extensive discussion of this property). In the present account, incremental theme verbs will be considered to be Result verbs iff, at the end of the event in question, the Theme is maximally affected by the verb – that is, iff the all of the parts of the entity relevant to the event in question are consumed, read, built, written, and so on. With verbs like *eat* and *devour*, the relevant parts of the entity are the edible parts, which vary depending on the thing being eaten (and sometimes the individual doing the eating). For instance, a chicken drumstick can be considered to be completely consumed even if the bone, tendons, and other inedible parts (which for some individuals include the skin, but for others do not) are left.

Given the claim above that *devour* is a Result verb and *eat* is not, this predicts that an event of devouring must maximally affect the edible parts of the Theme, while events of eating do not necessarily maximally affect the relevant parts. The standard view in the literature (e.g., Verkuyl 1972, 1993; Tenny 1994; Jackendoff 1996; Krifka 1998) holds that this is not the case, and that incremental theme verbs uniformly require that a quantized or bounded object be maximally affected by the event – in present terms, that all incremental theme verbs, including both *eat* and *devour*, have the Result component. This means that if the Theme is quantized or bounded (in the sense discussed in Footnote 6) the event will be telic. However, Smollett (2005) challenges this view, claiming that sentences with incremental theme verbs such as *eat* and *build* may be atelic even if the Theme is quantized, though this reading may be difficult to access without some contextual support (see Piñón 2008 for further discussion of this claim). Smollett provides the following examples to illustrate:

(48) a. Kathleen ate an apple for a couple of minutes while on the phone.

b. Kathleen ate an apple for a couple of minutes, and then she read her novel.

These sentences are well-formed despite the fact that they have a quantized Theme *an apple* and a *for X time* adverbial, which forces an atelic interpretation. In present terms, the Theme is not maximally affected by the event: the apple may not be finished by the time she is off the phone or reading her novel.

Smollett argues that, contrary to the claims of Tenny (1994) and Krifka (1998) (among others), a quantized object does not provide an endpoint to the event (i.e., it does not *delimit* the event). However, it does make an endpoint contextually available. Thus, in an event of eating an apple, the event does not *necessarily* proceed until the apple is maximally eaten, as evidenced by examples like (48), although the pragmatic availability of an endpoint that the Theme introduces means that without some additional context, there is usually an assumption is that the endpoint is reached. She shows further that there are sentential elements that can

force a delimited interpretation, such as resultative XPs and verb particles, as shown in (49) (modified from Smollett 2005, p. 55):

(49) a. *Kathleen ate an apple **to the core** for a couple of minutes while on the phone.
b. *Kathleen ate **up** an apple for a couple of minutes while on the phone.

In the terms of this chapter, these additional elements add a Result component where it was previously absent.

Smollett considers her analysis to apply to all incremental theme verbs. However, she only examines a small sample, largely limiting her examples to *eat* and *build*. I propose that while her claims are true of *eat*, they are not true of *devour*; for the latter, the quantized Theme truly does delimit. Thus, in terms of its aspectual properties and argument realization properties, *devour* is equivalent to *eat up*, as has been observed by Resnik (1993), who cites similar claims in Browne (1971) and Mittwoch (1971) (a notion that is further supported by the impossibility of **devour up*).[12] This can be shown with the following examples:

(50) a. *Kathleen devoured an apple for a couple of minutes while on the phone.
b. *Kathleen devoured an apple for a couple of minutes, and then she read her novel.

These sentences are ungrammatical due to the fact that the phrase *for a couple of minutes* forces an interpretation in which the event is atelic – it does not reach a point at which the apple is maximally devoured. Thus, unlike *eat*, *devour* is a Result verb.

This conclusion is further supported by the availability of the conative alternation (e.g., Tenny 1994). The conative construction involves embedding the object DP inside a PP headed by *at*. This serves to remove the implication that the object is totally affected by

[12]Resnik (1993), Browne (1971) and Mittwoch (1971) connect this property to the availability of UOA, as is done in this chapter. However, they do not connect the claim to a more general analysis of verbal lexical semantics and argument realization, and Resnik in particular ends up rejecting this analysis in favour of the analysis outlined above in Section 3.1.1, framed in terms of statistical tendencies.

the event; therefore, it is not available for Result verbs, which require that a totally-affected argument be expressed. This is seen in the following examples:[13]

(51) a. John scrubbed (at) the stain. ✗*Result*

b. John melted (*at) the ice. ✓*Result*

The conative construction is available for *eat*, but not *devour*:

(52) John ate at the pizza.

(53) *John devoured at the pizza.

This shows that unlike *eat*, *devour* is incompatible with an interpretation in which the Theme is not maximally affected, lending further support to the conclusion that *devour* is a Result verb, and *eat* is not.

3.4.3 Consequences: Selection and Manner-Result Complementarity

The above discussion shows that the selectional differences between *eat* and *devour* derive from the fact that *eat* expresses only Manner and *devour* expresses both Manner and Result. I now turn to some theoretical consequences of this finding. First, this shows that the selectional difference between *eat* and *devour*, in terms of availability of UOA, is not arbitrary. Instead, it is deriveable from differences in their meaning, in terms of whether they express the manner in which an event is caused, or a Result state holding of an argument, or both. As discussed in Section 3.3, expression of Manner and Result have consequences for argument realization: expression of Manner requires that the Agent acting in that manner must be

[13]The conative construction looks at first glance like an instance of argument omission, where the object is omitted and replaced with a PP. However, in the true object omission constructions (UOA, *out*-prefixation, resultative XP with a non-selected object), there is an understood object of the sort discussed in Section 3.2; this is not the case in the conative. In other words, (51a) cannot be interpreted as 'John scrubbed *stuff* at the stain'.

overtly expressed, and expression of Result requires that the Theme of which the Result holds must be expressed. Since *eat* encodes only Manner, then the Agent must be expressed, but the Theme of the eating can be omitted; since *devour* encodes both, neither argument can be dropped. Therefore, their c-selectional properties do not need to be listed in their lexical entries.

The other consequence of the analysis is that this provides a counterexample to Rappaport Hovav and Levin's (2010) claim of Manner-Result Complementarity, which they explain using the Lexicalization Constraint. Note that this constraint as phrased by them (quoted in (23) above) refers specifically to the association of roots with predicates in event schemas, rather than with Manner and Result per se; the link to Manner and Result comes from their analysis of the two meaning components as associated with different predicates in event schemas. Since they are expressed in different positions in a schema, and a root can only be associated with one position, then a root can express only one or the other. In this chapter I do not address how Manner and Result are associated with syntactic or semantic structures; I only show that both can be expressed by a single verb root. However the claim is analyzed, though, it is clear that *devour* is a counterexample to the claim of Manner-Result Complementarity.

Next I bring this analysis to a wider set of verbs and propose a fuller typology of how Manner and Result are expressed in verb meanings. I also bring other verb types that have been claimed to be counterexamples to the Lexicalization Constraint into the typology, and show that other verbs that disallow UOA pattern with *devour* in expressing both Manner and Result.

3.5 A typology of Manner and Result

In this section I apply the conception of Manner and Result developed in the previous sections, and the accompanying diagnostics, to a wider set of verbs, and develop a typology of these

semantic features. In Section 3.3 we saw verbs expressing only Manner and only Result, and in Section 3.4, we saw that *devour* expresses both Manner and Result. Here, I show that there is a class of verbs, exemplified by *clean*, which are underspecified for Manner and Result, and can express either in a sentence. This leads to a four-way typology of the semantic features of Manner and Result: a verb may be specified for one or the other, or neither, or both. Finally, I show how certain other classes of verbs fit into this typology.

I should note that I am limiting my typology to dynamic (i.e., non-stative) predicates here. The idea is that stative events do not involve any change, and so they cannot involve the meaning components of Manner and Result. So, in addition to the four-way typology proposed below in Section 3.5.2, stative predicates constitute a fifth type, for which Manner and Result are not applicable. However, I will not discuss stative predicates in any depth here.

3.5.1 Underspecification and Manner-Result ambiguity

So far we have seen verbs that express only Result (e.g., *break*), only Manner (*eat*), and both Manner and Result (*devour*). Here I show that there are dynamic verbs that are underspecified, that is, not specified as expressing either Manner or Result. A verb that is underspecified for Manner and Result shows ambiguity, and is able to appear in a sentence expressing either one or the other. Levin and Rappaport Hovav (2013, 2014) show that certain verbs that have been claimed to violate the Lexicalization Constraint are in fact ambiguous between Manner and Result, including *cut* and *clean*; I will illustrate this using *clean*, though the same arguments could be used for the others. I will be drawing from Levin and Rappaport Hovav (2014), though since, as discussed in Section 3.3, my conception of Manner and Result is different from that of those authors, the conclusions I draw will be somewhat different.

As Levin and Rappaport Hovav (2014) demonstrate, *clean* can function as either a Manner verb or a Result verb, with a slightly different meaning in each case. As a Manner verb, it

denotes actions or routines associated with cleaning or tidying, usually around one's home or place of work. As a Result verb, it denotes an event of becoming clean. Note that this is different from a word like *devour*; instead of denoting both Manner and Result, it denotes either one or the other. Furthermore, *clean* must denote one or the other component of meaning; it cannot appear in a sentence expressing neither Manner nor Result.

Clean can appear in sentences without an agentive subject, either occurring with a non-agentive causer, or undergoing the inchoative alternation. It can occur with an instrumental subject, as shown in (54), or with a non-agentive causer as subject, as in (55):

(54) This broom cleaned the floor better than that one.

(55) The rainstorm cleaned the sidewalks.

It also patterns with non-Manner verb with respect to the *accidentally* test:

(56) John accidentally cleaned the sidewalk (by spilling a bucket of water on it).

This sentence can be interpreted such that the cleaning itself is an accident. In these sentences, then, *clean* is not expressing Manner, since Manner verbs require the realization of an agentive causer. Here, the word denotes an event in which the Theme (*the floor* in (54), *the sidewalks* in (55)) ends up in a result state of being clean.

The tests for Result also show that *clean* is not a Result verb. The following example shows that the object is not necessarily maximally affected by any scalar change:

(57) John cleaned the floor for hours.

The most natural interpretation of (57) is not an iterative one, but instead one in which there was a single floor-cleaning event that spanned hours (at the end of which the floor may or may not be considered "clean"). It also undergoes the conative alternation:[14]

(58) John cleaned away at the kitchen for hours.

In these sentences, the verb denotes events in which the subject undergoes some routine associated with cleaning or tidying up, rather than necessarily denoting a Result of some argument becoming clean. For example, (58) is compatible with a situation in which the kitchen does not end up any cleaner as a result of John's actions.

Note that so far in the discussion of *clean*, I have only shown that, in certain sentences, it does *not* have certain components of meaning. I have only been able to conclude that in (54)-(56), it does not express Manner, and in (57)-(58), it does not express Result. So far, this has been compatible with a situation in which *clean* never expresses either. However, in this case, it would be able to appear in a sentence with neither an agentive causer nor a selected object. This kind of sentence is not possible. In sentences where the subject is a nonagentive causer, the selected object cannot be omitted or replaced:

(59) a. *This rainstorm out-cleaned the last one.
b. *All day long, the rainstorm cleaned.
c. *My broom cleaned itself to shreds.

Furthermore, if *clean* could appear expressing neither Manner nor Result, then there would be no constraints on argument omission, and it could appear in sentences with no arguments. This is not possible with either expletive *it* or *there*:[15]

[14]The conative alternation is difficult to obtain without a particle such as *away*. The reasons for this are unclear to me.

[15]Weather verbs, such as *rain* and *snow*, can appear without arguments, as shown in (60a); this suggests that they are specified for neither Manner nor Result, yet do not have the same requirement as *clean*, that they must express one or the other meaning in a given sentence. The question of why weather verbs differ from other dynamic verbs in this way is outside the scope of this chapter.

(60) a. #It cleaned (up) yesterday.
(cf. It rained yesterday.)
b. *There was cleaning (up) yesterday.

As the comparison with the verb *rain* suggests, (60a) is possible only if *it* has a non-expletive meaning, referring to some agentive cause. Thus, while *clean* is not necessarily specified for either Manner or Result, it must take on one or the other meaning in a sentence.

A possible alternative to treating *clean* as underspecified for Manner and Result is to analyze it as lexical ambiguity between a Manner *clean* and a Result *clean*. However, there is a conceptual advantage to the approach taken here. We have seen verbs denoting only Manner, only Result, Manner *and* Result, and Manner *or* Result. If the last set (i.e., that exemplified by *clean*) is real, rather than a collection of cases of lexical ambiguity, then the four form a typology that is expected if Manner and Result are treated as semantic features of a verb's meaning; see below for discussion of this typology. The existence of a "Manner or Result" set of verbs is expected if a verb can (or must) take on one or the other component of meaning in a sentence, as in the case of *clean*.

If a verb that is unspecified for either Manner or Result can take on one of those meaning components in a given sentence, that would suggest that these components can be added to a verb's meaning freely. That is, a verb specified for only Manner should be able to express both Manner and Result in a sentence, and likewise for a verb expressing only Result. This seems to be the case, although it can be difficult to diagnose. Rappaport Hovav and Levin (2012) point out that, even for Result verbs that can normally appear in inchoative sentences, there are contexts in which this alternation is impossible. For example, while both *clear* and *empty* can appear without an agentive subject, this is ungrammatical (or at least questionable) with certain arguments:

(61) a. The sky cleared.
b. ?*The table cleared.

(62) a. The tub emptied.

b. ?*The trash can emptied.

The generalization is that, when an event necessarily involves an agentive cause, that cause generally cannot be dropped. Thus, in (61), events of tables clearing almost always involve some Agent, while this is not the case for skies, and similarly for events of emptying for trash cans versus tubs in (62). This could mean that in cases where these verbs are used in such agentive causers, such as events of tables being cleared and trash cans being emptied, the Result verbs are expressing Manner as well.[16] There are likely similar examples for Manner verbs taking on a Result meaning, but this is a more difficult situation to come by. In any case, however, even if verbs can take on these meaning components as discussed here, it is crucially the case that they cannot be dropped. Thus, a verb specified for both Manner and Result, like *devour*, always expresses both Manner and Result, and both constraints on argument realization are necessarily present.

3.5.2 The typology

Now we have seen four types of verbs, in terms of specification of Manner and Result. A verb denoting an event of dynamic change can be underspecified for Manner and Result (e.g., *clean*), or specified for only Manner (*eat*), only Result (*break*), or both Manner and Result (*devour*). Treating Manner and Result as binary semantic features, which lead to the constraints on argument realization discussed in Section 3.3, a full typology can be defined, with each of the four available combinations of positive and negative values filled.[17] This typology is shown in Table 3.1. As discussed above, verbs marked with a negative value for

[16]Rappaport Hovav and Levin (2012) attribute this phenomenon to the Proper Containment Condition, which states that "when a change of state is properly contained within a causing act, the argument representing that act must be expressed in the same clause as the verb describing the change of state" (p. 41). This may achieve the same effect as the analysis I propose, though I do not explore the matter here.

[17]Nothing hinges on these features being binary; if [Manner] and [Result] are treated as privative features, with an absence of the feature rather than a negative value, then the same four-way typology is predicted.

one of the features can still express that component of meaning, but verbs marked positive must necessarily express that meaning.

	[– **Manner**]	[+ **Manner**]
[– **Result**]	Underspecified verbs e.g., *clean*	Manner verbs e.g., *eat*
[+ **Result**]	Result verbs e.g., *break*	Manner-Result verbs e.g., *devour*

Table 3.1: Typology of Manner and Result

It should be pointed out that this typology accounts only for a subset of verbal predicates, specifically transitive dynamic predicates. As discussed above, non-dynamic predicates do not necessarily involve any notion of agentive action or change of state, so they will not be specified for these features, and unlike underspecified dynamic predicates like *clean*, will not need to take on one or the other of the features in a sentence.[18] Furthermore, non-transitive dynamic predicates, such as weather verbs and the so-called "Theme unergatives" (e.g., *whistle, babble, glow*; see Levin and Rappaport Hovav 1995; Reinhart 2002, 2010), as well as ditransitive predicates, do not fall neatly into this picture due to their different number of arguments; I will not consider these groups of verbs in this study. However, for the set of verbs under consideration here, the typology in Table 3.1 can be explained using two principles: (i) a transitive dynamic predicate must express at least either Manner or Result; (ii) some verbal roots, by virtue of their meaning, necessarily express Manner or Result, or both (i.e., they require that their external argument be an Agent, and/or that their internal argument undergo scalar change). Principle (i) is likely a consequence of the nature of dynamicity; an event involving one or more participants is not dynamic if there is no participant acting agentively, or undergoing some change (or both).[19] Principle (ii) is a consequence of the lexical semantics of certain verbs; verbs specified for Manner or Result will satisfy (i) vacuously.

[18]Hale and Keyser (2002) note that psychological verbs are specified as pertaining to the mental state of the external argument (e.g., *love, respect*), while for others, the object is the experiencer (e.g., *anger, worry*). They attribute this to similar manner features to those they propose for dynamic predicates, as discussed in Footnote 10.

[19]This generalization does not appear to apply to zero-place predicates, such as weather verbs: they are dynamic predicates, but do not necessarily express either Manner or Result as they are characterized here. This is why the generalization is stated such that it applies only to transitive dynamic predicates. It is unclear

The [– Manner, – Result] verbs are simply those transitive verbs which do not satisfy (ii), but which must take on one or the other feature in order to appear in a dynamic sentence.

3.5.3 Other verbs

Having proposed a typology of Manner and Result, I now discuss how other verbs fit into the typology. We have seen a number of Manner verbs (verbs specified as [+ Manner, – Result]), such as *eat*, *sweep*, *scrub*, and *jog*. We have also seen several Result verbs ([– Manner, + Result]), including *break*, *open*, *rise*, and other verbs traditionally classed as unaccusative. As for ambiguous verbs ([– Manner, – Result]), in addition to *clean*, there is *cut*, as mentioned above and extensively discussed in Levin and Rappaport Hovav (2013, 2014). But so far, *devour* is the only Manner-Result verb we have seen. However, Beavers and Koontz-Garboden (2012) argue for certain other classes of Manner-Result verbs, including manner-of-killing verbs, and it is to these that we now turn.[20] I show that under the present characterization of Manner and Result, some of the verbs they discuss are diagnosed as Manner-Result verbs, but others fall into different categories.

For the verbs of killing, Beavers and Koontz-Garboden (2012) list *crucify, drown, guillotine*, and *hang*.[21] To this list I add *assassinate* and *murder*; while they do not specify the method by which the object is killed, they still necessarily require an agentive subject, which is

to me why weather verbs fall outside this generalization, but the reason is likely related to the fact that they denote events without necessary participants.

[20]Beavers and Koontz-Garboden (2012) also discuss manner-of-cooking verbs and ditransitive ballistic motion verbs, such as *throw*, *toss*, and so on; I will not discuss either group here, as they raise additional complications that are beyond the scope of this chapter. Manner-of-cooking verbs vary widely with respect to these tests for reasons that seem largely due to world knowledge of cooking techniques, rather than Manner and Result per se. As for ballistic motion verbs, their ditransitive nature complicates the diagnostics, though they may well pattern as Manner-Result verbs under the current analysis.

Furthermore, Beavers and Koontz-Garboden (2017) argue that certain motion verbs, including *climb* (contra Levin and Rappaport Hovav 2013, who claim that *climb* is ambiguous like *cut* and *clean*), *ski*, and some others, also entail both Manner and Result. However, these verbs are different from those discussed here, in that the Agent and the entity undergoing the scalar change are (generally) the same individual, and so realized as a single argument. Thus, they are not relevant to the current discussion of UOA, although they appear to fit the prediction made here that the argument in question cannot be omitted.

[21]They also list the verb *electrocute*; however, they note that, for some speakers, this verb does not necessarily entail a result state of death (I share this judgement), and so for these speakers it is simply not a Result verb. Due to this inconsistency, I will leave this verb aside.

the definition of Manner that I adopt in Section 3.3. Of these verbs, *crucify, guillotine, assassinate*, and *murder* pass the diagnostics for both Manner and Result, while *drown* and *hang* are diagnosed as expressing Result, but not Manner. All except *drown* and *hang* require an agentive subject, as demonstrated in the following examples:

(63) *Non-agentive subjects*

a. *John's heretic views crucified him.

b. *John's crimes guillotined him.

c. *The president's lack of adequate bodyguard assassinated him.

d. *John's ill-fated love affair murdered him.

e. The tsunami drowned John.

f. This noose hanged the rebel leader.

(64) *"Accidentally" interpretations*

The killer accidentally #crucified/#guillotined/#assassinated/#murdered/drowned/?hanged the president.

All of the verbs listed above require a selected object, as demonstrated in the following sentences:

(65) *Theme maximally affected*

The killer #crucified/#guillotined/#assassinated/#murdered/#drowned/#hanged the president for hours.

(66) *Conative construction*

John *crucified/*guillotined/*assassinated/*murdered/*drowned/*hanged at his foes, but to no avail.

Thus, while *drown* and *hang* are Result verbs, the rest pattern with *devour* as Manner-Result verbs.

We have now seen that *devour* is not alone as a Manner-Result verb; it is joined by certain verbs of manner-of-killing. I have also shown here that the set of verbs that has been classified as "manner-of-killing" by Beavers and Koontz-Garboden (2012) and others cited therein is not a unified class, but rather includes verbs that fit in different cells of the typology in Table 3.1.

3.6 Conclusions

While Manner and Result have long been considered to be important components of the lexical semantics of verbs, often with aspectual consequences, I have shown that they impose constraints on argument realization. If a verb expresses Manner, then an agentive external argument must be projected, and if a verb expresses Result, then an argument of which that Result is predicated must be projected. I have shown that a verb root may be specified one or the other of these meaning components, or both, or neither, yielding a full typology of the two semantic features, [± Manner] and [± Result]. This provides an argument against the Lexicalization Constraint, as Manner and Result are not in complementary distribution. This also explains the difference in argument structure between *eat* and *devour*: *eat* is specified for only Manner, meaning that only the subject must be realized, and the object can be dropped; *devour* is specified for both Manner and Result, meaning that both the subject and object must be realized, and UOA is impossible. C-selection features are not necessary in the lexical entries of these verbs to account for the difference between them, as it is not arbitrary, but instead conditioned by the meanings of the verbs. Thus, the lexical entries for these words can be simplified, in keeping with the goals of this thesis.

Chapter 4

The Distribution of Selected Prepositions

4.1 Introduction

Of the various verb-complement relationships, one kind that has particularly resisted principled explanation is that which involves a verb taking a PP complement that must be headed by a particular, seemingly idiosyncratic, preposition, as in the case of *rely*:

(1) John relies *(on) his computer.

These are problematic since *on* does not appear to express its usual, locative meaning; it is not the case that there is an event or state of "John relying" which is located on his computer, for instance. Instead, it intuitively feels that *rely on* is acting as a single lexical item that takes *his computer* as a complement. Here I refer to expressions such as *rely on* as idiosyncratic verb-preposition combinations (IVPCs). Authors have taken various approaches to account for this phenomenon. Some (e.g., Baltin 1989; Everaert 1991, 1993, 2010; Bruening 2010) treat expressions like *rely on* simply as idioms that consist of a verb and its prepositional complement. For some others (e.g., Pesetsky 1991, 1995; Neeleman 1997),

the verb and preposition are analyzed as working together to assign a thematic role to the complement of P, through various mechanisms. Another line of research (Botwinik-Rotem 2004; Botwinik 2013) proposes that the verbs involved in this phenomenon form a class that cannot assign accusative case, and so some preposition must be inserted to license the complement. Although some of these studies (Neeleman 1997; Botwinik-Rotem 2004; Botwinik 2013) provide some generalizations as to the set of verbs and prepositions that may be involved in IVPCs, they are seen by all authors as quite unpredictable on the whole, as evidenced by the fact that verbs with similar meanings often take different prepositions in different languages; for instance, unlike its English counterpart, the Russian verb *zavizet'* 'depend' selects *ot* 'from' (Pesetsky 1991), rather than a preposition meaning 'on'.

In this chapter I provide an analysis of IVPCs that stems from the observation that certain kinds of IVPCs are systematically absent in a set of languages that can be characterized in terms of Talmy's (1985; 1991; 2000) Framing Typology. Specifically, languages like English, Dutch, Russian, Finnish, Hungarian, and Hebrew are all satellite-framed languages, and all have verbs that cannot appear without a certain preposition, like *rely*. On the other hand, French, Arabic, Italian, Turkish, and Basque are all verb-framed, and all lack such verbs, although they do have other kinds of IVPCs. I explain this curious fact by claiming that IVPCs fall into various categories, which correspond to different kinds of complex predicate. The typologically-restricted category, exemplified by *rely*, involves a particular rule of complex predicate formation in which the verb contributes monadic predicate that comes to embed another predicate; the availability of this rule determines the placement of a language in the Framing Typology, such that it is available in satellite-framed languages and unavailable in verb-framed languages. On the other hand, other kinds of IVPCs involve a process of complex predicate formation that is available in all languages. Thus, the correlation between the types of IVPCs present in a language and its Framing properties receives a principled explanation.

I begin the chapter in Section 4.2 by establishing the three categories of IVPC that will be the topic of this chapter, each of which is associated with an approach to PP complementation that has been taken in the literature. These types are: Dummy Case Assigner (DCA) IVPCs, in which the preposition is a DCA, inserted to license the complement DP when the verb itself does not assign accusative Case, as in *despair of*; idiom IVPCs, in which the verb has a separate meaning on its own and can take complements without the selected P, but takes on a non-compositional meaning in the presence of that P, as in *believe in*; and non-idiom IVPCs, in which the verb does not have an interpretation in the absence of the selected P, and that P is not a DCA, as in *rely on*. It is the latter group that is typologically restricted; the first two kinds are present in both satellite-framed and verb-framed languages.

Next, in Section 4.3 I show that, for all types of IVPC, the possible combinations of verbs and prepositions are predictable from the semantics of the lexical items themselves. To show this, I establish a theory of thematic relations that combines the insights of Reinhart's (2002; 2010) Theta System with Jackendoff's (1990) two-tiered thematic system, such that the features of the Theta System describe Agent-Patient relations on the action tier, while other relations belong on the thematic tier and are characterized in terms of abstractions of spatial relationships (a version of the "Localistic Hypothesis" of Gruber 1965; Jackendoff 1983, 1990). Taken together, this two-tiered system allows an analysis of IVPCs such that the thematic properties of the verb and the preposition must be compatible, with the preposition duplicating or reinforcing an aspect of the lexical semantics of the verb. This allows for the possible combinations of verbs and prepositions to be explained in a principled way, while still allowing for the flexibility and idiosyncrasy in the combinations seen within and between languages.

In Section 4.4 I turn to the cross-linguistic distribution of IVPCs. I show that, while French has DCA and idiom IVPCs, it lacks non-idiom IVPCs. Before turning to a wider set of languages, I discuss the Framing Typology, adopting an analysis based on that of Gehrke (2008) that can be extended to IVPCs, in which satellite-framed languages are distinguished

from verb-framed languages by the presence of a rule of semantic composition (Rule C; Snyder 2005, 2012) that allows the formation of complex predicates with manner verbs that lack any incremental component in their semantics; this kind of complex predicate is impossible in verb-framed languages. I then provide a survey of nine languages (excluding English and French) to show that non-idiom IVPCs are systematically present in satellite-framed languages, and absent in verb-framed languages. Finally, in Section 4.5 I provide an analysis of IVPCs in which they are characterized as complex predicates in the sense of Neeleman and Van de Koot (2002), with non-idiom IVPCs involving a specific kind of complex predicate in which the verb contributes a monadic, rather than diadic, predicate; I equate this with the mode of semantic composition made available by Rule C, thus explaining the typological restrictions on non-idiom IVPCs. Thus, this chapter shows that there are regularities in the distribution of IVPCs both within and between languages that are unexpected in an account where IVPCs are made possible by arbitrary syntactic features, and provides an account for those regularities based on the lexical semantics of the verbs and prepositions, and principles of semantic composition that are independently necessary from analyses of complex predicates and the Framing Typology.

4.2 Kinds of verb-preposition combination

In this section I introduce the three kinds of IVPCs that are the topic of this chapter, along with a review on the literature on l-selection and PP-complements that provides the basis for each one. First, in Section 4.2.1 I discuss Dummy Case Assigners, which are usually left out of discussion of IVPCs, and claim that they characterize the first kind of IVPC under discussion. I then turn to more canonical IVPCs, those more frequently analyzed as involving l-selection. The term "l-selection" was coined independently at least twice, by Pesetsky (1991, 1995) and by Everaert (1991, 1993), although it is canonically associated with Pesetsky. In Section 4.2.2 I discuss Everaert's notion of l-selection; for Everaert, l-selection is the mechanism behind

idioms in general, and IVPCs are simply somewhat minimal examples of idioms, consisting only of a verb and a preposition. I claim that this is the source of the second kind of IVPC, namely idiom IVPCs. In Section 4.2.3 I discuss Pesetsky's notion of l-selection, which is framed in terms of a verb and preposition jointly assigning a θ-role to a single argument; this, I claim, is the mechanism behind non-idiom IVPCs.

4.2.1 Dummy Case Assigners

The first way in which IVPCs can come about is when the preposition is a Dummy Case Assigner (DCA, to borrow the terminology of Tremblay 1996). The most well-known instance of DCAs is not with IVPCs, but rather in the case of *of*-insertion in the complements of deverbal nouns as in (2b), argued by Chomsky (1986) to be a last-resort operation to satisfy the Case Filter (i.e., to provide Case to an argument and thereby license it in an environment where it cannot otherwise be licensed by structural Case).

(2) a. The Romans destroyed **the city**.
b. the destruction **of the city**

Tremblay (1996) argues that the French prepositions *à* 'at, to' and *de* 'of, from', in contrast to other French prepositions (which I follow Tremblay in calling "lexical prepositions"), are DCAs that are inserted to satisfy the Case Filter. Specifically, they both alternate with thematic arguments of the verb that are otherwise realized as DPs: *à* precedes the subject of the embedded infinitive in causatives to assign dative case, as in (3), and *de* precedes complements of deverbal nouns, as in (4), the French parallel of (2) (adapted from Tremblay 1996, p. 80; DAT stands for dative case):

(3) a. **Charles** lit un roman.
Charles reads a novel
'Charles is reading a novel.'

b. Anne a fait lire un roman **à Charles**.
Anne AUX made read a novel DAT Charles
'Anne made Charles read a novel.'

(4) a. Les Romains ont détruit **la ville**.
the Romans AUX destroyed the city
'The Romans destroyed the city.'

b. la destruction **de la ville**
the destruction of the city
'the destruction of the city'

As in English *of*-insertion, these prepositions do not contribute any meaning to the sentence, but only serve to license arguments of the (verbal or nominal) predicate. In contrast to *à* and *de*, Tremblay argues that the lexical (i.e., non-DCA) prepositions necessarily introduce some relation distinct from the meaning of the predicate.[1] Marelj (2004) proposes that there are two versions of the English preposition *to*: one is a DCA assigning dative case, and one is a lexical (i.e., non-DCA) preposition with a locative or directional meaning. The former marks Recipients and alternates with dative DPs in ditransitive structures (5a), while the latter marks Goals and does not alternate with a dative DP (6a) (adapted from Marelj 2004, p. 76):

(5) a. Max shipped his clothes **to Mary**. *Dative* to

b. Max shipped **Mary** his clothes.

(6) a. Max shipped his clothes **to London**. *Locative* to

b. #Max shipped **London** his clothes.

I propose that English IVPCs that involve *of* are instances of DCA, in which a verb is unable to assign accusative case and yet takes a complement, necessitating *of*-insertion.

[1]Tremblay (1996) appears to apply the DCA analysis to all instances of *à* and *de*, not just those that alternate with DP arguments as in (3) and (4). However, I argue in Section 4.4.1 that there are two kinds of *à*, one of which is a dative DCA and the other a locative preposition, following Marelj's (2004) analysis of English *to*, outlined below.

Tremblay also argues that the English preposition *with* is ambiguous, appearing as a DCA in some constructions (including Locative Alternation contexts, e.g., *Anne presented Mary with a gift*) and as a lexical preposition in others. This is not incompatible with the account I develop in this chapter; however, I have not seen any English IVPCs involving *with* that appear to be DCAs. See Section 4.3.3 for some discussion.

These IVPCs include *despair of, dispose of,* and *tire of.* (I have no proposal as to why these particular verbs do not assign accusative case and need a DCA, although it should be noted that they all fall into the same semantic class as other IVPC verbs in terms of the thematic properties of their complements, as discussed in Section 4.3.2.) There do not seem to be any English IVPCs that involve dative *to*; while there are many verbs that can take complements headed by *to* (e.g., *talk to, listen to*), they all seem to have a compositional meaning involving the locative (or more accurately, directional) *to*. However, in a non-ditransitive context, it is difficult to tell whether *to* is used in a locative or a dative sense, so it may be that certain cases of verbs requiring a complement headed by *to* are in fact instances of DCA; further research is needed to explore this point. Furthermore, I propose in Section 4.4.1 that in French, the dative DCA *à* does appear in some IVPCs, in addition to the genitive DCA *de*.

4.2.2 Idiom IVPCs

I now turn to IVPCs that cannot be analyzed as involving a DCA; these are often analyzed in terms of l-selection. One dominant formulation of l-selection treats it as the mechanism behind any idiosyncrasies above the level of the individual morpheme. To this end Everaert (1991, 1993, 2010) develops a general definition of l-selection as selection for particular lexical items, and considers its coverage to include all idiomatic expressions. Similar accounts of idiomaticity are found in Baltin (1989) and Bruening (2010), among others (although neither author treats l-selection as separate from a general notion of "selection"). Perhaps the most explicit characterization of this view of idiomaticity as selection is provided by Everaert (2010), who also provides extensive discussion of precedents to this claim. Everaert provides a formal definition of l-selection as selection by a head for particular lexical items contained in that head's maximal projection, as shown in (7); from this, he provides the formal definition of idioms in (8), which employs his notion of l-selection (Everaert 2010, p. 94):

(7) a. L-selection involves the selection by one terminal element α of another terminal element β where the projection of β is in the syntactic domain of α.

b. The syntactic domain of head α is the set of nodes contained in Max(α) that are distinct from and do not contain α.

(8) An idiom is a syntactic constituent X such that there is a set of terminal elements Q, Q = (α_1,...,α_i,...,α_n) for n≥2, for which it holds that α_i is the head of X and for all α_j, j≠i, α_j is L-selected by α_i.[2]

By this definition, the IVPCs of interest in this paper are simply idioms, though somewhat more minimal than bigger idioms like *kick the bucket* or *The cat* {*is/was/...*} *out of the bag*.

While the adoption of a formal definition of idioms is beyond the scope of this chapter, I assume a somewhat somewhat narrower characterization than that in Everaert's account, although I think it more closely reflects the way the term is generally used. Everaert's definition in (8) makes no claims about the meaning of the idiom in relation to the meanings of the words when used in isolation, yet a hallmark of idiomaticity is that the interpretation of the idiom is non-compositional – it is not predictable based on the meanings of the words and the way they are combined. For example, for the phrase *kick the bucket*, there is a compositional meaning available (an event of striking some contextually-specified bucket with one's foot), and yet the idiomatic meaning has nothing to do with kicking or buckets, but instead means (roughly) 'to die'. Thus, I propose that in order for a phrase to be an idiom, each element in that phrase must have some meaning of its own when used outside the idiom, and the meaning of an idiom as a whole must not be predictable based on the meanings of its parts and their composition. This captures the noncompositionality that sets idioms apart

[2]This definition characterizes an idiom as a constituent whose head l-selects one or more terminal nodes in the constituent; this appears to be able to account for attested idioms, but since it allows for selection of terminal nodes embedded arbitrarily deeply in the constituent, it is likely that this definition overgenerates and predicts idioms with structures that are not seen in language. However, as I do not adopt Everaert's account of idioms, I do not address the issue here.

from other kinds of phrase – the elements of the idiom take on some special meaning only in the context of that idiom that is different from their "normal", non-idiomatic meaning.

If IVPCs are a special case of idiomaticity, it is expected that they should pattern like idioms, within and between languages. That is, any language that includes idioms (which includes, to my knowledge, all known natural languages) and verbs taking PP complements or their equivalents (e.g., locative cases in languages such as Finnish and Basque; see Section 4.4.3) would be expected to have IVPCs. In this chapter I argue that this is indeed the case, and that every language has verbs that take on a special meaning when they take a complement headed by a specific preposition. For example, in English, *believe in* has a meaning that is not predictable given the meanings of *believe* and *in*; likewise, *count on* is an idiomatic combination of *count* and *on*. Similar examples appear in French and other languages; see the examples and discussion in Section 4.4. This crosslinguistic universality is to be expected; if a language has idioms, and also has verbs taking PP complements, then there is no reason why a language cannot have V-P idioms. However, even with the caveat added in the previous paragraph regarding the meanings of elements within the idiom versus in isolation, Everaert's definition of l-selection and idioms is not constrained enough to capture the distribution of IVPCs within a language; in Section 4.3 I show that only verbs and prepositions with certain semantics are possible in IVPCs, while Everaert's account does not provide such restrictions. In other words, under the account of idioms outlined above, there is not necessarily an expectation that the idioms will be restricted to certain groups of verbs and prepositions, and impossible with others. Furthermore, I claim that idioms are not the only possible source of non-DCA IVPCs; there are other IVPCs that do not pattern like idioms. I turn to these for the remainder of this section.

4.2.3 Non-idiom IVPCs

Another approach to PP-complementation is that of Pesetsky (1991, 1995), who provides a formulation of l-selection as part of a discussion of the various kinds of selectional features.

C-selection and s-selection, selection for syntactic and semantic properties (respectively), have been discussed in detail in Chapters 2 and 3. Here I discuss Pesetsky's account of l-selection, which will form the basis of the second type of IVPC that I propose in this paper.

It is widely known that, while many verbs can take PPs as arguments, there are at least two kinds of PP arguments (Pesetsky 1991, 1995; Neeleman 1997; Marelj 2004; Botwinik 2013; in Section 4.2.1 above, Dummy Case Assigners were introduced as a third kind). The first kind occurs when a predicate requires an argument of a particular semantic type, such as a direction or location, that can be realized by a PP. For example, the verb *put* requires as one of its obligatory arguments some kind of locative expression, which is generally realized by a PP headed by some locative P, but may also be realized by a locative pro-form (such as *there*) or adverbial (such as *away*);[3] as shown in (9f), this cannot be characterized simply as syntactic selection for either a PP or a locative adverb, but instead any complement with locative semantics is possible (adapted from Pesetsky 1991, p. 9):

(9) a. Bill put the book on the table.
b. Bill put the book under the table.
c. Bill put the book there.
d. Bill put the book away.
e. *Bill put the book.
f. *Bill put the book for the library.

As was discussed in Chapter 2, Pesetsky (1991) describes this kind of phenomenon not as selection for any particular lexical item, or for a syntactic category (P or PP), but rather as s-selection for a locative phrase. In principle, any expression denoting some locative meaning is allowed, regardless of its syntactic properties or lexical makeup.

[3]However, as mentioned in Chapter 2, *there* and *away* as used here could be analyzed as pro-PPs, in which case all of the possible complements are of the category PP (although as shown in (9f), this still does not mean just any PP complement is available). But this relationship is still constrained by the semantics of the PP rather than the presence of a given P head, so it is still distinct from the kind of selection in (10).

The other kind of PP argument involves a PP headed by a particular lexical item. For example, the verb *rely* requires a complement headed by the preposition *on*; no other kind of complement is possible, even those that can replace PPs headed by *on* in other contexts:

(10) a. Bill relies *(on) his computer.

b. *Bill relies under his computer.

c. *Bill relies there.

d. *Bill relies.

Here, a particular lexical item is required, despite the fact that it does not appear to contribute its usual meaning to the sentence – in (10a), it seems that nothing is construed as being "on" Bill's computer in any directional or locative sense. Thus, the selection is not syntactic or semantic, but rather lexical. Hence Pesetsky's l-selection, which "makes reference to *subcategories* of syntactic categories – in the limiting case, to individual words and, additionally (perhaps) to features like [+finite]" (Pesetsky 1991, p. 10). Meanwhile, there is a thematic relationship between the verb *rely* and the DP-complement of the preposition *on*; there is a relationship of "reliance" between Bill and his computer. Neeleman (1997, p. 90) observes that in a thematic sense, "it is not the PP as a whole but the DP contained in it that functions as an argument – an argument to which the verb and the preposition jointly assign a θ-role". In other words, while *rely* lexically selects the preposition *on*, it semantically (or thematically) selects for the DP-complement of *on*.

Pesetsky (1995) formulates a more precise definition of l-selection that takes into account both the lexical and thematic aspects of the selection involved, situated within a theory of selection for arguments bearing various thematic roles, or θ-selection.[4] This theory includes

[4]Pesetsky (1995) points out that the notion of θ-selection contrasts with the more common notions of θ-marking and θ-assignment, which originate in Chomsky (1981) and play a prominent part in many ensuing works. With θ-selection, thematic roles are not assigned by a predicate, but are instead borne by certain expressions and selected for by the predicate. Pesetsky (1995, p. 133) notes, however, that "[p]robably, the two views can be made to describe the same set of situations; thus, they are not distinct theories but merely different points of view."

the notion of *mediated θ-selection*, which is introduced to account for the argument structures of verbs like *give*. Pesetsky observes that, in a sentence like *Sue gave the book to Mary*, the goal of *give* is not *to Mary*, but instead simply *Mary*. He argues that in this case, the goal is selected for by both the verb and the preposition, an option made possible by mediated θ-selection (Pesetsky 1995, p. 133):

(11) *Mediated θ-selection*

A preposition P can participate in mediated θ-selection for a θ-role R if P itself θ-selects R.

In other words, mediated θ-selection is possible when the verb and preposition both select for the same thematic role.

This relationship between the verb *give* and the recipient DP *Mary* is parallel to that described above between *rely* and *his computer* in (10a); to rephrase Neeleman's (1997) observation in terms of θ-selection, both *rely* and *on* can be said to θ-select the complement *his computer*. However, the two examples have a difference: in the case of *give*, the θ-role assigned is that of a Goal, a role that is assigned canonically by the preposition *to*; that is, the thematic properties of the verb and preposition "set sufficient conditions for the acceptability of a particular preposition" (Pesetsky 1995, p. 135). With *rely*, this is not the case. The thematic relationship between *rely* and *his computer* is not easily defined (although see Section 4.3 for discussion), and is not in any obvious way identical to that which normally holds between *on* and its complement. Pesetsky claims that in this case, a preposition may count as a θ-selector of a particular role with a particular verb only because of a "special property" of that verb. L-selection is the name of this special property; Pesetsky (1995, p. 135) defines it as follows:

(12) *L-selection*

If a predicate π θ-selects R and l-selects α, its θ-selection for R is satisfied only by an argument that is also θ-selected by α.

Thus, l-selection, like mediated θ-selection in general, is bound by the requirement that the verb and preposition select for the same thematic role. Pesetsky notes that the choice of preposition here is idiosyncratic, and that the verb-preposition combination is like an idiom in that "a predicate receives an interpretation only if in construction with a designated element, as a consequence of an unpredictable lexical specification" (Pesetsky 1995, p. 135). In other words, while the verb and preposition must select the same thematic role, the choice of a particular preposition among those that can select that role is unpredictable.

In sum, Pesetsky's l-selection accounts for IVPCs by claiming that V and P jointly select for a single θ-role, though the choice of the P involved is (at least partially) idiosyncratic (which distinguishes l-selection from other, non-idiosyncratic cases of mediated θ-selection, in which the semantics of the V and P is sufficient to license the particular V-P combination involved). A similar account is proposed for the same phenomenon by Neeleman (1997), in which the the V and P come to share a θ-role through a process of identification, and this shared θ-role is assigned to the complement of P; in this account, the PP is licensed by an idiosyncratic meaning in order to satisfy Chomsky's (1986) principle of Full Interpretation (although see Section 4.3 for arguments that the verb-preposition combinations are not as idiosyncratic as they appear).

A note is in order on the identity of θ-roles. Pesetsky (1995) frames l-selection in terms of the verb and preposition θ-selecting the same θ-role, as does Neeleman's (1997) account of PP-complementation. Neither author formulates a theory of θ-roles to go along with their definitions, and so they do not explore the consequences of this part of the theory. However, either formulation would imply that, however the θ-role selected by *rely* is defined, that exact role must also be selected by *on*. It is not clear that this is the same role that *on* selects in its

more canonical uses, as in (9a), in which *on* denotes a location relative to its DP-complement. In Section 4.3 I address this issue, and reformulate the definition in terms of non-contradiction, rather than identity, between the roles assigned by the verb and preposition, in roughly the sense of Goldschmidt and Zwarts (2016). In short, the thematic relationship between *rely* and its arguments in (10a) involves some metaphorical sense in which Bill is supported by his computer, and part of the semantics of *on* also includes a notion of support (Zwarts 2010), and so the θ-roles selected by *rely* and *on* are compatible; they do not contradict one another. However, in principle there are other prepositions whose semantics could also be compatible with the θ-role assigned by *rely*, and so there is still an element of idiosyncrasy involved in the selection of *on* by *rely*; that is, in Pesetsky's terminology, it is a case of l-selection, rather than simple mediated θ-selection.

Note that on this account, the mechanism behind IVPCs is distinct from the idiomaticity discussed in Section 4.2.2. On the idiomatic account, IVPCs come about when a specific verb-preposition combination takes on a non-compositional meaning, while on Pesetsky's account, there is a relationship between the verb and preposition in which they jointly assign a θ-role to an argument. In this chapter, I argue that both mechanisms are at play. IVPCs in which the verb has other complementation options besides the PP-complement (e.g., if the verb can also take a DP direct object) are idioms that happens to consist of only a verb and a preposition, as discussed above; I refer to these as idiom IVPCs, and they include *believe in, trust in,* and *count on*. IVPCs with a verb that has no other complementation options, on the other hand, result from a rule like Pesetsky's l-selection; I refer to these as non-idiom IVPCs, and they include *rely on, wait for,* and *comply with*. (This is in addition to DCA IVPCs. Technically, those are also "non-idiom" IVPCs, in the sense that both are distinct from idiom IVPCs; however, in the interest of brevity, I will reserve the term "non-idiom IVPC" for those that are *neither* idiom nor Dummy Case Assigner IVPCs.)

The contrast between idiom and non-idiom IVPCs is subtle, as both kinds appear to share the same properties in terms of the semantics of the verbs and prepositions involved,

as discussed in Section 4.3. Thus, it may be tempting to analyze non-idiom IVPCs as a subclass of idiom IVPCs in which the verb is a *caboodle item* (Harley 2014), a root that may be interpreted only in a particular idiom and does not exist outside of that one syntactic frame. However, in Section 4.4 I show that they differ in their crosslinguistic distribution, such that all languages have idiom IVPCs (and Dummy Case Assigner IVPCs, discussed below), while only certain languages have non-idiom IVPCs. Thus, while non-idiom IVPCs fit the definition of caboodle items, they show a more restricted distribution. For instance, while caboodle items exist in French, as exemplified by the element *leu-leu* in the expression *à la queue-leu-leu* 'in single file' (Rob Truswell, p.c.), I show in Section 4.4.1 that non-idiom IVPCs do not. I develop an account of non-idiom IVPCs that explains their limited distribution in Section 4.5, as caboodle items that, with the following preposition, form a kind of complex predicate that is typologically restricted. But first, I take a closer look at the semantics and language-internal distribution of IVPCs in general.

4.3 Patterns in IVPCs: The Vs and the Ps

In this section I show evidence, mainly building on claims in Botwinik (2013) and Pesetsky (1995), that neither the set of verbs nor the set of prepositions that are involved in IVPCs are randomly distributed across the verbs and prepositions of a language. Instead, the verbs and prepositions that may be involved, as well as the possible combinations of the two, can be characterized in terms of the thematic roles of their complements. However, the kinds of thematic properties that are relevant to verbs in IVPCs differ from those relevant to the prepositions. Thus, before discussing the sets of verbs and prepositions themselves, I will discuss the theory of thematic relations that is needed in order to characterize them, which involves the features of Reinhart's (2002; 2010) Theta System, combined with insights on the semantics of prepositions from Jackendoff (1990), Zwarts and Winter (2000), and Zwarts

(2005, 2010), unifying the two in a way based on the division of labour between the action tier and the thematic tier in Jackendoff (1990).

I propose that the feature-based Theta System accounts for thematic relationships involving participants acting agentively in and being affected by events, which are relationships associated with the action tier, and therefore determine mapping to the direct grammatical functions of subject and object. The thematic tier is more involved with notions of (physical or abstract) displacement and location, and when the participants involved do not fall on the action tier, they are realized as oblique arguments (in English, generally as PPs). Therefore, both are involved in IVPCs: the action tier determines which verbs may be involved in IVPCs, namely those for which the internal argument is not a Patient or another action tier participant. The thematic tier is involved in predicting which prepositions may appear with those verbs.

I should note that the claims made in this section are relevant to all three kinds of IVPC, except that since the prepositions in DCA IVPCs are semantically empty prepositions present only to satisfy the Case Filter, the generalizations made in Section 4.3.3 regarding the thematic properties of prepositions likely do not apply to them.

4.3.1 Two types of thematic relation

To characterize the set of verbs that may be involved in IVPCs, I follow Botwinik (2013) in adopting features from Reinhart's (2002; 2010) Theta System, which specify whether or not a given argument's mental state is relevant to the θ-role, and whether or not it is causally involved in the event denoted by the verb. However, the features of the Theta System are not suited to characterize which prepositions can appear in IVPCs in general, nor which particular pairs of preposition and verb will be possible. The relevant feature clusters are underspecified, and are compatible with a number of different kinds of thematic relation. The fine-grained differences between them are better characterized in terms of (in this case, generally abstract) spatial orientation, paths, and force dynamics, along the lines of the

discussion of preposition semantics in Jackendoff (1990), Zwarts and Winter (2000), and Zwarts (2005, 2010). Here I put forward the beginnings of a theory of prepositional θ-roles that can capture these fine-grained distinctions.

As will be discussed in Section 4.3.2, the thematic properties that determine the set of verbs involved in IVPCs can be characterized in terms of the Theta System of Reinhart (2002, 2010), which deals with such notions as Agent, Patient, Experiencer, and so on. While I do not adopt the Theta System in all of its details in the form proposed by Reinhart, I take the feature specifications to be a suitable description of the roles involved in the action tier; as discussed below in Section 4.3.2, Botwinik (2013) shows that these features can predict which verbs will be involved in IVPCs.

The Theta System is a theory of argument structure and realization that involves a decomposition of the possible θ-roles into two binary features, and a set of mapping rules that determine the surface realization of arguments based on those features. The features and composition of θ-roles involved are summarized below (adapted somewhat from Botwinik 2013, pp. 130–131):

(13) *The features that compose θ-roles*

m = mental state involved ("mental state" is a cover term for notions like volition, intention, emotion, perception)

c = cause change

(14) *The θ-clusters*

[+m+c] = Agent

[+m-c] = Experiencer

[-m+c] = Instrument

[-m-c] = Theme/Patient

[+m] = Sentient

[+c] = Cause

[-m] = Subject Matter/Target

[-c] = Goal

In (14), Subject Matter and Target are intended in the sense of Pesetsky (1995), exemplified by the complements of the prepositions in the sentences *John worried about the television set* and *John was angry at the article*, respectively. The Goal role includes such notions as Recipient, Beneficiary, Spatial Goal, and so on. The system includes rules that map arguments to grammatical functions, which essentially map both fully-specified roles (i.e., those for which both features are specified) and the "positive" underspecified roles [+m] (Sentient) and [+c] (Cause) to the grammatical functions of Subject and Object, while the [-m] and [-c] roles may be realized by oblique (PP) complements; see below and Section 4.3.2 for discussion.

As will be shown in Section 4.3.2, the verbs in IVPCs are those that take an internal argument with the cluster [-m] or [-c]. However, while this classification of θ-roles suffices to predict which verbs may be involved in l-selection, it is too coarse-grained to make any predictions as to which prepositions they will select. Reinhart (2002, 2010) and Botwinik (2013) acknowledge this coarse-grained nature of these roles; Reinhart (2002, p. 289) notes that these two are "the most puzzling, and context-dependent" of the roles. As mentioned above, the [-m] role is taken to correspond to Pesetsky's (1995) Target and Subject Matter roles, while [-c] is labelled as the Goal role, which subsumes the various kinds of goal arguments (Botwinik 2013). However, while Reinhart (2002, 2010) outlines criteria for distinguishing between a [-m] role and a [-c] role (namely, [-m] can be considered to be a "sufficient condition" or cause of the event, while [-c] cannot), these criteria are vague and difficult to apply and test for consistently. Furthermore, neither these authors nor Pesetsky (1995) give clear-cut diagnostics to determine which of the subcategories (e.g., Target versus Subject Matter) a given verb selects for, nor if those listed above constitute an exhaustive list of the more fine-grained roles that make up the [-m] and [-c] roles. Finally, neither these roles nor

other θ-roles that have been suggested for verbs correspond directly to any roles that have been suggested for the complements of Ps in studies of prepositional meaning (e.g., Gruber 1965; Jackendoff 1990; Zwarts and Winter 2000; Svenonius 2004, 2010; Zwarts 2005, 2010); indeed, the semantics of prepositions is generally described in terms of spatial orientations, relationships and paths (or alternatively, in terms of vectors and force dynamics in the case of Zwarts and Winter 2000; Zwarts 2005, 2010), and abstractions thereof, rather than θ-roles as they are used with verbs. Therefore, to my knowledge, current accounts of thematic relations do not provide the tools to predict which prepositions will be able to be l-selected by which verbs, if selection by V is construed in terms of Reinhartian features.

While the formulation of a fully-fledged theory of θ-roles that unites the semantics of verbs and prepositions would be a momentous task and would carry me too far afield for this thesis, here I provide a brief sketch of how such a theory might look for the verbs and prepositions involved in l-selection. Note that by the very nature of the problem, such a theory will not be able to predict exactly which preposition will be l-selected by each verb; IVPCs by definition involve some idiosyncrasy. For example, the theory must be able to account for the fact that English *depend* selects *on*, while the Russian verb *zavizet'* 'depend' selects *ot* 'from' (Pesetsky 1991), and other such differences within and between languages. In other words, the relationship between verbs and the possible l-selected prepositions will be many-to-many, and various different aspects of a verb's meaning might contribute to its l-selectional properties. The key, then, is not finding which prepositions select for the "same" θ-role as a given verb (contrary to the formulation in Pesetsky 1995); instead, it is expected that the semantics of the preposition and the verb are non-contradictory (in a sense similar to that in Goldschmidt and Zwarts 2016), with the preposition reiterating or reinforcing some aspect of the verb's meaning.

The division of labour between the Reinhartian features and the more fine-grained relations found in preposition semantics is reminiscent of the division of labour between the *action tier* and the *thematic tier* in Jackendoff's (1990) theory of Conceptual Semantics. Jackendoff

shows that many traditional θ-roles can be characterized in terms of spatial relations (or abstractions thereof), such as Theme (defined as the object being moved or located), Goal (the end-point of motion), Source (point where motion begins), and so on, while there are others, such as Actor and Patient, that cannot.[5] The latter two are instead best defined in terms of "doer of the action" and "affected entity", respectively, rather than any spatial relations, and in fact often seem to apply to some of the same arguments as the spatial roles in a given sentence. Jackendoff demonstrates this with the following sentences, noting that the (spatial) thematic roles of the subjects and objects differ despite the verb remaining the same (Jackendoff 1990, p. 125):

(15) a. Sue hit Fred.

b. The car hit the tree.

c. Pete hit the ball into the field.

In (15a), thought of in terms of what is moving where in the event denoted by the sentence, the Theme of the event is *Sue* (or more likely, her hand), while the Goal of motion is *Fred*. This is more clearly seen in (15b), where *the car* is the Theme and *the tree* is the Goal. In (15c), on the other hand, the Theme is the object (*the ball*), and the Goal is *the field*, while *Pete* might be seen as the Source of the motion.

However, while the more spatial thematic roles are assigned inconsistently to the arguments of *hit*, the Actor and Patient roles can be assigned consistently to its subject and direct object. Jackendoff (1990) diagnoses these roles with the test frames *What X did was ...* for Actors (16), and *What happened to X was ...* for Patients (17), and shows that the subject is consistently an Actor and the object a Patient ((17) is from Jackendoff 1990, p. 126):

(16) a. What Sue did was hit Fred.

b. What the car did was hit the tree.

[5] In this section I follow Jackendoff's terminology, including the term "Actor", although it is used in a sense that appears equivalent to the term "Agent" used in Chapter 3 in relation to the Manner component.

c. What Pete did was hit the ball into the field.

(17) a. What happened to Fred was Sue hit him.

b. What happened to the tree was the car hit it.

c. What happened to the ball was Pete hit it into the field.

Thus, Jackendoff shows that there are two kinds of thematic roles at play, such that an argument may be assigned a role of each kind in a given sentence. However, not all arguments receive both kinds of roles; *the field* in (15c) is neither an Actor nor a Patient, and there are verbs whose subjects and objects do not receive either of these roles, such as the objects of *enter* and *receive*.

Jackendoff (1990) argues that these two types of roles should be conceived of as two different *tiers* of conceptual roles, the *thematic tier* for the more spatial roles dealing with motion and location and the *action tier* for Actor-Patient relations. The action tier is concerned with who is acting on whom, or which participants are the source and recipients of some force exerted in the eventuality denoted by the sentence, and is extended to such roles as the Experiencers and Stimuli of some psychological predicates. It is this tier that is most closely connected to the realization of arguments in the subject and object positions of the sentence. The thematic tier has to do with (physical or abstract) motion or location, and determines the distribution of oblique arguments (i.e., PPs in English) for those participants that are not represented on the action tier.

The relationship between the Jackendovian tiers and Reinhart's 2002; 2010 Theta System, with the roles featurally defined as in (14), is not immediately clear, as it stands. This is, I think, partly due to inconsistencies with which the terms for θ-roles are used by different authors. For instance, Reinhart, as with many others, treats Theme and Patient as equivalent ([-m-c]) while Jackendoff considers them to be different roles belonging to separate tiers. However, setting these differences aside, a generalization can be made that those roles in (14) that get mapped to subject and object positions – that is, the fully specified and positive-

marked underspecified roles in (14) – are those that fall upon the action tier in some way or another. The negative-marked underspecified roles, namely [-m] (Subject Matter/Target) and [-c] (Goal), which are more vaguely defined in Reinhart's system as discussed above, are those that tend not to have a place on the action tier, and are instead defined only in terms of (physical or abstract) motion and location, properties of the thematic tier.[6] Thus, there is a tight connection between the Theta System and the action tier, and a much looser connection with the thematic tier. This difference is a natural consequence of the different goals of Reinhart (2002, 2010) and Jackendoff (1990): Reinhart is more concerned with determining how different participants in an event will map to the major grammatical functions, while Jackendoff is attempting to account for the full conceptual structure of event descriptions, which includes the more oblique positions in the sentence in addition to subjects and objects.

As for the characterization of the thematic tier, Jackendoff (1990) defines the various roles (Theme, Goal, Source, and so on) as cover terms for various positions in lexical conceptual structures (LCSs), in which they are arguments of various functions, such as GO, TO, IN, and so on. In addition to literal spatial movement and location, these relationships can be used in a more abstract sense to describe relationships of possession, ascription of properties, and so on; the proposal that these different fields are conceived of as abstractions of spatial relations is known as the "Localistic Hypothesis" (Gruber 1965; Jackendoff 1983, 1990). This kind of analysis is used in later works on preposition semantics as well, such as Svenonius (2004, 2010). However, as mentioned above, many recent works on prepositional semantics, such as Zwarts and Winter (2000); Zwarts (2005, 2010), redefine these roles in terms of vectors and

[6]One exception to this generalization is the role of Beneficiary, which Reinhart (2002, 2010) subsumes under the Goal role ([-c]) and Jackendoff (1990) places on the action tier. This is a rare case where Jackendoff corresponds an action tier role with a preposition, *for*. This may suggest that Jackendoff's analysis of Benefactives as part of the action tier is not consistent with his analysis as a whole, or that the Benefactives found in ditransitive constructions should not be equated with the complements of *for*; or perhaps it could suggest that the relationship between the action tier and grammatical functions (and by extension, between Jackendoff's tiers and the Theta System) is more complicated than the current characterization suggests. In fact, given the fact that PPs relate to the thematic tier and non-PP complements to the action tier, any role that can alternate between realization as a PP and an (in)direct object poses a potential problem to the present analysis. Since these roles are outside the current investigation, I will leave this question to further research, and consider the meaning of *for* (and other alternating roles) to be related to the thematic tier, rather than the action tier, although they may well turn out to be involved with both.

force dynamics. These theories retain the fine-grained analyses of the differences between the prepositions and thematic relations found in sentences, while also relating them to what is understood about our non-linguistic conception of movement and forces in the physical world.

In sum, instead of a single set of θ-roles, participants in an event are related to syntactic positions based on their positions on two tiers of meanings. The action tier is related to which participants are acting (agentively or not) on others, and which are being (positively or negatively) affected by the event; the different roles on this tier can be characterized and distinguished by the features of Reinhart's (2002; 2010) Theta System, as in (14) above. The thematic tier is related to our conception of the (physical or abstract) spatial relationships between participants and their movements and locations, and is best characterized in terms of vectors and force-dynamic relationships as defined by Zwarts and Winter (2000); Zwarts (2005, 2010). Since the action tier is related to the direct grammatical functions (subjects and objects) and the thematic tier is more involved in prepositional syntax and semantics, they are both involved in different ways in the determination of which verbs and which prepositions will be involved in IVPCs, in ways outlined below in the remainder of Section 4.3. In particular, in Section 4.3.3 I show how the present view of the thematic tier allows for an account in which the meaning of a PP complement can augment the meaning of a verb as long as the contributions of the two elements are non-contradictory, building on claims made by Goldschmidt and Zwarts (2016) in the domain of physical motion and forces.

4.3.2 L-selecting verbs

It seems to have been widely assumed that the set of verbs that can l-select is random, that is, it is unpredictable based on the semantics of the verb whether or not it will be in an IVPC. This is often not explicitly discussed in studies of IVPCs, although it is sometimes mentioned in passing, as when Pesetsky (1991, p. 10) notes that "[p]redicates simply have arbitrary selectional properties in this domain". It also seems to be an implicit assumption in any proposal that combines l-selection and idioms, to the extent that idiomatic interpretations

are randomly distributed across verbs. Here I show, drawing primarily on Botwinik (2013), that the set of verbs that can potentially take idiosyncratic PP-complements can be defined in terms of properties of the thematic roles of their complements. However, unlike Botwinik, I do not claim that the set of verbs in IVPCs is fully predictable from the verbs' semantics, but rather that there is an implicational universal: all verbs found in IVPCs have certain semantic properties (but not all verbs with those properties will necessarily appear in IVPCs).

One of the more explicit discussions of the arbitrariness of IVPCs is in Neeleman (1997). In addition to idiosyncrasy in the choice of which preposition is selected by a particular verb (to be discussed in Section 4.3.3), he observes that "it seems to a large extent arbitrary whether a verb takes a PP- or a DP-complement", and that "there is some cross-linguistic diversity. If a verb selects a PP-complement in one language, the corresponding verb does not necessarily do so in another language" (Neeleman 1997, pp. 114–115). However, he does point out one exception to this arbitrariness: if a verb's complement is an "affected object", it will always be realized by a DP, rather than a PP.

A similar observation is made by Levin (1999), albeit in a somewhat different context. In an effort to define the notion of "object" in event-structural terms, Levin observes that there are two types of transitive verbs, in terms of the role of the object in the event as a whole. The first are the "core transitive verbs" (CTVs), for which the object is an entity that is directly affected by the actions of an Agent – that is, they are prototypical Patients in Dowty's (1991) sense. The CTVs include such verbs as *cut, destroy, kill,* and the transitive alternants of *break* and *open*. The other type of transitive verbs are those for which the object is not a prototypical Patient, that is, all transitive verbs that do not fall into the set of CTVs. These are the "noncore transitive verbs" (NCTVs). Levin notes that for all CTVs, both near-synonyms in the same language and translation equivalents in other languages will necessarily also be transitive. On the other hand, many English NCTVs have near-synonyms (in English) and translation equivalents in other languages that are non-transitive verbs, taking oblique objects (PPs, or DPs bearing some inherent case, depending on the language).

While Levin (1999) does not address the issue of l-selection per se, her claims can be taken to support the observation in Neeleman (1997) that verbs that can appear in IVPCs cannot take objects that are prototypical Patients, as the Patient role is necessarily associated with CTVs. On the other hand, verbs selecting other roles may take idiosyncratic PP-complements, though they do not necessarily; the NCTVs themselves are transitive, and of the verbs that take oblique objects, not all necessarily have idiosyncratic Ps.

The only study I am aware of that attempts to classify the set of l-selecting verbs in terms of their semantic properties is Botwinik (2013), which builds on Botwinik-Rotem (2004). Botwinik's study focuses on Hebrew, although it includes some data and analysis of English and Russian as well, and is couched in the framework of the Theta System (Reinhart 2002, 2010), as outlined above in Section 4.3.1. Using the decomposition of θ-roles into the features [±m] and [±c] as summarized in (13) and (14) above, Botwinik (2013) examines the verbs that take PP-complements in Hebrew, and finds that the complements of all of these verbs bear the θ-clusters [-m] or [-c].[7] She claims that this follows from the mapping principles of the Theta System, which dictate that "an underspecified internal θ-role is realized as a PP" (Botwinik 2013, p. 131), or as some inherent case, including dative. (Other mapping principles exclude the [+m] and [+c] clusters from this generalization by ensuring that they are mapped to the external argument.)

It seems to be the case that all of the verbs appearing in IVPCs in English and other languages assign some version of the [-m] and [-c] roles. This would explain the observations of Neeleman (1997) and Levin (1999), noted above, although Botwinik's claim goes further in excluding other non-patient object roles, such as experiencers (e.g., the object of *The doctor angered John*). Furthermore, Botwinik's claims predict that *all* verbs that take [-m] or [-c] objects will be PP-verbs. The set of verbs taking [-c] arguments include such English verbs as *support, betray, order,* and *help*, which take DP objects (their Hebrew translation

[7]Botwinik (2013) refers to the relevant group of verbs as PP-verbs, and distinguishes those from verbs that select for locative or directional PPs. She notes in Botwinik-Rotem (2004) that a majority of the PP-verbs under discussion, with only a few exceptions, have the PP-complement as their only complementation option.

equivalents are all PP-verbs). Botwinik claims that these verbs in English actually assign dative case, which is indistinguishable from accusative in English, thus satisfying the mapping principles. However, while dative and accusative may be identical on the surface in English, they are distinguished in French, where dative complements take the preposition *à*, and the third-person pronominal clitics *lui* (singular) and *leur* (plural) rather than the accusative clitics *le, la,* and *les*. At least some of these verbs demonstrably assign accusative case in French, including *aider* 'help' and *favoriser* 'favour, support' (adapted from Troberg 2011, pp. 408, 411):

(18) a. C' est à toi que je dis, père, aide **tes enfants**.
that is to you that I say father help your children
'It's to you that I say, father, help your children.

b. L' examinateur a favorisé **ce candidat**.
the examiner has favoured this candidate
'The examiner favoured this candidate.'

The assignment of accusative case with these verbs is evident from the absence of the dative preposition *à* in their complements. These verbs could be accounted for if accusative case can be assigned as a lexical case by certain verbs, such that it is lexical when assigned by verbs selecting for [-m] or [-c] objects, and structural otherwise. However, these examples suffice to show that Botwinik's generalization amounts to a one-way implication: if a verb is a PP-verb, then it must select for a [-m] or [-c] object, but not necessarily vice versa. While I do not adopt the exact analysis of Botwinik (2013) here, nor do I adopt the Theta System framework as a whole, I will take the θ-clusters of (14) as descriptive terms and adopt a weak version of Botwinik's claim: only verbs assigning (or, in Pesetsky's 1995 terminology, θ-selecting) the [-m] or [-c] roles may take idiosyncratic PP-complements; no other verbs may do so. This aspect of IVPCs, then, is not completely arbitrary, although the set of verbs within the group assigning [-m] or [-c] that will be in IVPCs in a given language still appears to show idiosyncrasy.

4.3.3 L-selected prepositions

While Botwinik (2013) establishes that verbs that take idiosyncratic PP-complements will be those that take complements with the θ-roles [-m] (Target or Subject Matter) or [-c] (Goal), she does not provide an analysis that predicts which prepositions can be selected.[8] However, given Botwinik's (2013) observations, outlined above, on the θ-selecting properties of the verbs in question, as well as Pesetsky's (1995) analysis of l-selection as an instance of mediated θ-selection, a more specific prediction is available. Recall from (12) above that with l-selection, as with other instances of mediated θ-selection, the DP complement of the l-selected P must be θ-selected by both the verb and the preposition. That is, the verb and the preposition must select the same θ-role. This leads to the prediction that, among l-selecting verbs that select for [-m], only prepositions that also select for [-m] will be possible, and likewise for verbs and prepositions selecting [-c].

While this classification of θ-roles suffices to predict which verbs may be involved in l-selection, it is too coarse-grained to make any predictions as to which prepositions they will select. However, recall from Section 4.3.1 the two tiers of the proposed theory of thematic relations: the action tier, encoding Actor-Patient relationships and determining the assignment of arguments to subject and object positions; and the thematic tier, encoding relations of (physical or abstract) movement and location, interacting with the action tier and determining the content and distribution of oblique constituents in the sentence. In the way outlined in Section 4.3.2, the distribution of verbs with respect to IVPCs can be predicted based on the action tier properties of the verb: if the inner argument is of a type that falls on the action tier (e.g., a Patient), then it must be realized as a direct object; however, if it is not on the action tier, as with [-m] and [-c] arguments, then it may be an IVPC. These arguments

[8]Botwinik (2013) does note that the prepositions involved are all "phonologically small" (p. 141) and suggests that this is due to their status (in her analysis) as mere functional material, present only in order to satisfy case requirements. I argue that this phonological smallness, to the extent that it holds of all prepositions in IVPCs, is due to the fact that phonologically "larger" prepositions tend to have richer denotations, and are thus less amenable to extension to more abstract contexts as discussed in this section.

will still have a place on the thematic tier, and it is from the thematic-tier properties that the specific preposition present in the IVPC can be predicted.

To start, consider the following selection of (non-idiom) IVPCs, arranged by the selected preposition:

(19) a. on: depend, rely

b. with: toy, comply

The verbs that l-select a given preposition should share some component of their semantics, in terms of the (thematic) relationship between the event or state they denote and the individual denoted by the complement of the preposition. This shared component should have some connection to the meaning of the selected preposition.[9]

Consider the verbs in (19a), which select the preposition *on*. The meaning of *on* is characterized by Zwarts (2005, 2010) in terms of a force-dynamic relationship in which the complement of *on* (the *ground*) exerts a force that provides support for the external argument (the *figure*; see e.g. Svenonius 2010; Zwarts 2010 on figure and ground in preposition semantics), with the figure resting on the ground in some way. While no literal (or at least, physical) supporting relationship is involved in the semantics of *depend* and *rely*, some metaphorical (or perhaps literal, but non-spatial) support can be construed. Both *depend* and *rely* denote a situation in which the external argument receives some crucial help from the complement of *on*. This can be construed as a situation where the complement is supporting the external argument. For instance, in the sentence *John relies/depends on his computer*, John is in some way supported by his computer. Thus, the θ-role involved in the l-selection of *on* appears to be a role of Support. Since this notion of Support is related to a particular spatial configuration relative to the complement of *on*, or non-spatial abstractions thereof in

[9]It may be that there are further generalizations to be made beyond those discussed in this section. The verbs in (19) show some regularity in their aspectual properties: *depend* and *rely* both denote canonical states, and *toy* and *comply* are activities. Thus, the choice of preposition may be tied to the aspectual class of the verb. However, I do not know if this generalization holds beyond the sample in (19). I leave further investigation of this issue for further research.

accordance with the Localistic Hypothesis, the role of the *on*-PP belongs on the thematic tier rather than the action tier.

Furthermore, the θ-roles involved in (19b) appear to be closely related to the familiar roles associated with the preposition *with*. In a sentence like *John toyed with Ben*, there is a sense in which Ben is being manipulated against his will, much like the hammer in a sentence like *John fixed the deck with a hammer*. Thus, the role of *with* when it appears with *toy* appears to be an extension of its Instrument role. In *comply with*, the role appears to be more closely related to the Comitative use of *with* (e.g., *John went with Mary*; Jackendoff 1990 characterizes this role as Accompaniment); in *John complied with the policy*, there is a sense in which John (or at least his actions) "goes along with" the policy. This role is related to the notion of the participants in the event being located together, with one foregrounded relative to the other (the latter being the complement of *with*; see Jackendoff 1990 for further discussion of *with* with respect to the thematic tier). Thus, while there appear to be various roles associated with *with* in IVPCs, each is related to a role associated with the preposition in less abstract senses, and since they are all related to the (spatial or abstract) interactions and locations of participants in the event, each has a place in the thematic tier. Whether these various roles can be reduced to a single one is unclear, although it should be noted that the more canonical, non-metaphorical uses of *with* are quite varied as well.

The θ-roles suggested above appear to be the right level of granularity for characterizing l-selection. They are more specific than the features proposed by Reinhart (2002, 2010) and Botwinik (2013), and do not seem to contradict the claims of those authors, but instead refine their schema to account for the encyclopedic content of particular verbs and prepositions. As discussed in Section 4.3.1, Reinhart's features mainly have to do with relationships on Jackendoff's (1990) action tier, which determines whether or not a participant can be realized as a DP argument of a verb (subject or direct object), while the choice of preposition is instead determined by the thematic tier, on which Reinhart's system is silent. In addition, it carries over the insights from studies of preposition semantics (e.g., Gruber 1965; Svenonius

2004, 2010; Zwarts 2005, 2010), particularly in the case of spatial prepositions such as *on*. Finally, it allows room for the idiosyncrasy that is characteristic of l-selection. For instance, while the crucial element of the meaning of *depend* in English is the implication of some metaphorical support, its Russian equivalent *zavizet'* selects *ot* 'from', suggesting that the verb in Russian is construed in the sense that the complement is a Source (of aid or support). This is equally compatible with the meaning of the verb, and the fact that English construes the verb in terms of selecting for a Support role, while Russian construes it as selecting for a Source, and not vice versa (or some other possible construal), appears to be idiosyncratic.

As with other kinds of selectional relationships, I assume that the well-formedness of an IVPC is evaluated at the point of transfer to the semantic interface (as discussed in Chapter 2, Section 2.4.2). In this analysis, the question raised by Merchant (2016) of whether prepositions are selected by a root or by its categorizing head does not arise. Merchant provides numerous examples of derivationally-related words that require complements headed by different prepositions, as with *pride oneself in* (verb), *pride in* (noun), and *proud of* (adjective). Since the choice of preposition depends on the category of the word rather than the root on its own, Merchant concludes that it is categorizing heads that select, rather than roots. However, this only follows if selection is an operation that applies in the narrow syntax as the selecting element is merged, as assumed by Merchant. If, as proposed in this thesis, selection applies to already-formed structures at the interfaces, it is not surprising, and perhaps expected, that the categorizing head (and perhaps other elements in the same phase as the selecting item, such as verb particles and prefixes) will have some effect on the choice of preposition (see similar discussion, in a somewhat different context, in Chapter 3, Section 3.3.2). Thus, as long as in each case the selected preposition is compatible with the meaning of the selecting predicate as outlined above, the type of data presented by Merchant is fully compatible with this analysis; given the data presented by Merchant, this appears to

be the case, although further research is needed to verify that each case can be accounted for in this way.[10]

As mentioned above, what has been presented in this section is a mere sketch of a theory, and is not intended as a fully-fledged account of thematic relations. Such a theory should account for a far wider range of verbs, and involve diagnostics that clearly show what θ-role(s) a verb can select for, based on the meaning of the verb. I should also mention again that the thematic roles proposed above should not be treated as primitives in the theory, but rather as a shorthand for the different ways arguments can fit into the conceptual structures associated with the verbs (as in Jackendoff 1990). However, the present sketch should be enough to show that the choice of prepositions l-selected by a given verb is non-random, and that adopting the proposal (based on Pesetsky 1995) that the definition of l-selection as mediated θ-selection is feasible (with the caveat, mentioned above, that the θ-roles selected by the verb and preposition need not be identical, but only non-contradictory). In Section 4.5 I propose a theory of the semantics of IVPCs that builds on the account presented here. The theory to be proposed is based also on the observation that non-idiom IVPCs are possible only in languages that are satellite-framed in the sense of Talmy (1985, 1991, 2000), to which we now turn.

4.4 IVPCs and the Framing Typology

Recall from Section 4.2 that I proposed the existence of three types of IVPC: idiom IVPCs, which include a verb that can take other kinds of complements, but receives an idiomatic interpretation in the presence of a specific preposition (*believe in, count on*); non-idiom IVPCs, in which the verb cannot take any complement besides a specific (lexical) preposition

[10]This conclusion is supported by the fact that the selected prepositions in Merchant's (2016) data are the same semantically light prepositions that appear in IVPCs in general, as discussed above, and in fact many of the examples involve *of* and *to*, of which at least some are likely examples of DCAs. It should also be noted that in many cases, derivationally-related words have lexicalized differences in meaning that are not predictable based on the meaning of the root alone; this could lead to differences in the possible prepositions that derivationally-related words can occur with.

(*rely on, comply with*); and DCA IVPCs, in which the preposition is a Dummy Case Assigner, rather than a lexical preposition (*despair of, dispose of*). The distinction between DCA IVPCs and the other two kinds should be relatively uncontroversial, as it is based on a well-known distinction between DCAs and other (lexical) prepositions (e.g., Chomsky 1981; Tremblay 1996; Marelj 2004; Svenonius 2010). However, at this point the distinction between idiom and non-idiom IVPCs may appear arbitrary. As far as I am aware, the two types are conflated in all previous studies of IVPCs (or l-selection or PP-complements; e.g., Everaert 1991, 1993, 2010; Pesetsky 1991, 1995; Neeleman 1997; Botwinik-Rotem 2004; Botwinik 2013). Thus, it may be tempting to propose that non-idiom IVPCs are in fact a subgroup of the idiom IVPCs, for which the verb happens not to appear outside the idiom; that is, *rely on* may just be an idiom IVPC where the verb happens to be *caboodle* item (Harley 2014), a root that may only be interpreted in a particular syntactic frame, in this case a context in which it takes a complement headed by *on*.

While an analysis of *rely on* and its kin as idiom IVPCs can account for its distribution and properties in English, it does not account for their crosslinguistic distribution. Idiom IVPCs seem to be found in every language, as is expected, given that every language has idioms, and there is no reason not to expect idioms consisting of a verb and a preposition (or postposition, locative case marker, or other equivalent morpheme type) in a language where the necessary kinds of lexical item are available. However, I show in this section that non-idiom IVPCs are absent in many languages. I show this first in Section 4.4.1 with French, in which there are many idiom and DCA IVPCs but no non-idiom IVPCs. I next argue that this difference is linked to the Framing Typology of Talmy (1985, 1991, 2000): satellite-framed languages like English have non-idiom IVPCs, but verb-framed languages like French do not. In Section 4.4.2, I provide an outline of the Framing Typology and some analyses of it, focusing on the analyses of Snyder (2005, 2012) and Gehrke (2008), a version of which I adopt in this chapter. Then in Section 4.4.3 I provide data from a sample of satellite-framed

and verb-framed languages to show that the correlation between the presence of non-idiom IVPCs and the Framing Typology does indeed hold.

4.4.1 IVPCs in French

Idiom IVPCs in French

Like English, French has many verbs that can appear with a variety of different complements, of which one is a PP headed by a specific preposition; that is to say, French has many idiom IVPCs. Among these verbs, a wide range of prepositions are available, such as *en* 'in', *dans* 'in(side)', *sur* 'on', and perhaps others. Examples of this kind of verb are given in (20):[11]

(20) a. *compter sur* 'count/depend/rely on'
compter DP 'count DP'

b. *espérer en/dans/de* 'hope for'
espérer DP 'wait for'
espérer CP/TP 'hope CP/TP'

c. *croire en* 'believe in'
croire DP 'believe DP'
croire CP 'believe CP'

d. *insister sur* 'insist on, stress'
insister pour faire ... 'insist on doing ...'
insister (intrans) 'insist, keep on (intrans)'

As shown here, each of these verbs can also occur with other kinds of complements, including DPs and PPs headed by other prepositions, with (often subtle) changes in verb meaning depending on the complement. These are idiom IVPCs, comparable to English examples such as *count on* and *believe in*.

[11]Definitions in this subsection are taken from the *Collins French Online Dictionary* and *La Trésor de la Langue Française informatisé*.

DCA IVPCs in French

French also has a number of IVPCs in which the verb cannot appear with other complements – that is, IVPCs that are not idioms. However, this only occurs with the prepositions *à* 'at, to' and *de* 'of, from'. I argue that the prepositions in these constructions are DCAs (Spang-Hanssen 1963; Jones 1996; Tremblay 1996), rather than lexical prepositions, and so these are DCA IVPCs, rather than (lexical) non-idiom IVPCs. I will show this first for *de* and then for *à*. The kinds of verbs taking complements headed by these prepositions are discussed in Spang-Hanssen (1963), upon which much of the following discussion is based.

Recall from Section 4.2.1 that like the English preposition *of*, French *de* is inserted to the complement of nouns and adjectives to assign case where accusative case is unavailable. I claim that this is also the case with verbs that take a PP-complement headed by *de*. These verbs fall into two types. Those of the first type appear with a reflexive pronominal clitic (*se* in third person; the first and second person reflexive clitics are indistinguishable from the corresponding non-reflexive accusative clitics). For these verbs, "the relationship between [the verb] and the complement introduced by *de* seems as narrow as that which relates a direct object to a direct transitive verb" (Spang-Hanssen 1963, p. 50).[12] In other words, *de* does not seem to contribute meaning with these verbs. Some examples of these verbs are given in (21):

(21) *se souvenir de* 'remember'
s'emparer de 'grab'
s'occuper de 'be in charge of'
se passer de 'go without'

[12]My translation. The original text: "[...] le rapport entre le groupe verbal ainsi constitué et le complément amené par *de* semble aussi étroit que celui qui relie l'objet direct au verbe transitif direct."

The other type of verb taking *de*-PP complements do not take a reflexive clitic. However, like the verbs in (21), Spang-Hanssen (1963) notes that these *de*-PP complements are akin to direct objects, in that *de* does not appear to contribute to the meaning.[13]

(22) *bénéficier de* 'enjoy, benefit from'
jouir de 'enjoy'
profiter de 'take advantage of'

Since these verbs require *de* in their complements, despite it not making any obvious contribution to the interpretation of the expression, I argue that these are DCA IVPCs. As with the English examples of DCA IVPCs (e.g., *despair of, dispose of, tire of*), it is not clear why these particular verbs do not assign accusative case, although for the examples in (21) it may be related to the presence of *se*. And again as in English, it should be noted that all of these verbs fall into the semantic category outlined in Section 4.3.2, as expected.

Turning to verbs that take PP-complements headed by *à*, these fall into two types. For the first type, the *à*-PP denotes a location, and is therefore pronominalized by the clitic *y* (roughly, 'there'); these examples can be discounted, as locative PPs are a separate phenomenon from l-selection (see Section 4.2.3). For the others, the *à*-PP is pronominalized by the dative clitic (*lui* 3SG or *leur* 3PL; the first and second person dative clitics are no different from the corresponding accusative clitics and so are less informative). Examples of this are given in (23):

(23) *ressembler à* 'resemble'
appartenir à 'belong to'
nuire à 'harm'

[13]For some of these, it may be arguable that *de* is contributing to the meaning, indicating that the object is a Source; *bénéficier de* 'enjoy, benefit from' and *profiter de* 'take advantage of' seem like particularly good candidates for this kind of analysis, although a closer analysis of the lexical semantics of these verbs and others like them in French is needed to be sure. If this is the case, then these examples are not idiosyncratic at all (i.e., not IVPCs), but are instead compositional constructions involving a verb and a lexical preposition. The crucial point here is that they are not (lexical) non-idiom IVPCs, on either analysis.

obéir à 'obey'

plaire à 'please'

résister à 'resist'

This dative *à* is a DCA (Tremblay 1996; see Section 4.2.1), and so I analyze these as DCA IVPCs. The question arises as to why some DCA IVPCs take *de*, while others take *à*. It is shown by Troberg (2011) that verbs that take dative objects fall into two natural classes, in terms of their semantics. The first class includes cases where the verb denotes a local relationship between the complement of the *à*-PP and another argument of the verb, which can include such relationships as co-location, possession and comparison. This is the case with ditransitive verbs (which are not discussed here), as well as statives such as *ressembler à* 'resemble' and *appartenir à* 'belong to'. The second class includes verbs that indicates some directed action (as in *nuire à* 'harm') or emotional state (as in *plaire à* 'please'), in which case the complement of the *à*-PP denotes a Goal, which can include object experiencers of psychological verbs (Troberg 2011).

Thus, it could be argued that verbs that require a complement headed by *à* are not IVPCs at all, as the relationship between the verb and the PP-complement is predictable, rather than idiosyncratic. As for the verbs outside these classes that take a complement but do not assign accusative case, they are DCA IVPCs taking PP-complements headed by *de*. These are distinguished from idiom IVPCs in that the verb does not have other complementation options, and from non-idiom IVPCs in that the preposition does not contribute a meaning that can be characterized in terms of thematic properties, as discussed in Section 4.3.3, but instead appears to simply license arguments that would not otherwise receive Case. As with all IVPCs, the verbs involved in these DCA IVPCs do not have an internal argument that falls on the action tier in the sense discussed in Section 4.3.2.

To sum up, French has numerous idiom IVPCs, as well as DCA IVPCs headed by *de* (and perhaps *à*, although these are less idiosyncratic). However, French does not have

verbs for which a PP-complement headed by a lexical (non-DCA) preposition is the only complementation. Verbs meanings that are frequently realized by non-idiom IVPCs in English and other languages that have them (see Section 4.4.3) are in French either transitive (e.g., *chercher* 'look for'), idiom IVPCs (e.g., *compter sur* 'count on'), or DCAs (e.g., *ressembler á* 'resemble'). Thus, I conclude that French does not have non-idiom IVPCs like *rely on*. In the remainder of this section I show that French is not alone in this pattern, and that the presence or absence of non-idiom IVPCs is tied to the Framing Typology.

4.4.2 The Framing Typology

I have shown that non-idiom IVPCs are lacking in French. In Section 4.4.3 below I show that this absence is not an accident, and that these IVPCs are systematically absent in a typological class of languages, namely the verb-framed languages of Talmy's (1985; 1991; 2000) Framing Typology. Before doing so, however, I will discuss the Framing Typology itself. I begin with the descriptive generalizations behind the typology, and then outline some theoretical accounts. There are a number of competing accounts for this typology, basing the typological difference on various different properties of the languages in question. Since one goal of this chapter is to explain the distribution of IVPCs in principled terms, the main criterion for evaluating analyses of the Framing Typology should be the extension of the analysis to IVPCs. To that end, I focus on the account developed by Snyder (2005, 2012) and Gehrke (2008), a version of which I adopt in this chapter.

Verb-framed and satellite-framed languages

Talmy (1985, 1991, 2000) shows that languages vary as to how the various components of meaning involved in events denoted by sentences are realized by the various lexical items in the sentence. Talmy focuses on motion events, although he argues that his generalizations hold for other event types as well. He claims that there are certain meaning components that are inherent in any event of motion; these include the fact of Motion itself, as well as the

Figure (the entity that is in motion), the Ground (the reference frame or object against which the motion is characterized), and the Path followed by the figure (generally with respect to the Ground); furthermore, there is often a "Co-Event" that provides further information about the motion event, such as the cause or manner of motion. Talmy refers to the Path component as the "framing event", since it is this component that differentiates events of motion from other kinds of event.

Talmy's Framing Typology is based on the observation that languages differ as to where the framing component (i.e., Path) of a motion event is lexicalized in a sentence, on the assumption that a verb root can lexicalize at most one additional component besides Motion itself. In some languages the Path is typically lexicalized in a "satellite" to the main verb of the sentence; satellites include PPs, verb particles and prefixes, and certain kinds of adverbs in the VP.[14] This is the s(atellite)-framed pattern, and languages of this type are s-languages. In these languages, the verb itself often lexicalizes a Co-Event, such as the manner or cause of motion. English is a canonical s-language, as can be seen in (24):

(24) The bottle floated out.

Here, the Path is provided by the satellite, *out*. The verb *floated* indicates the manner of motion. Sentences like (24) are characteristic of the s-framed pattern.

In other languages, the Path of motion is lexicalized in the main verb of the sentence. This is the v(erb)-framed pattern; languages of this type are v-languages.[15] In these languages, if

[14]Talmy does not consider most transitive PPs (i.e., those that are not verb particles) to be included in the set of satellites; however, most authors who have worked with the Framing Typology, including those cited in Section (26), consider any VP-internal PPs to be possible satellites. I follow these authors in making the same assumption.

[15]Slobin (2004) proposes a third type of languages, equipollently-framed languages, in which path and manner are both expressed by verb roots, either in serial verb constructions (as in Chinese) or in separate roots in a complex verb (as in Algonquian languages). Talmy (1985, 1991, 2000), on the other hand, treats these as s-framed languages, on the assumption that the non-path verbal element is the main verb and the others are satellites. As Beavers et al. (2010) and Levin and Rappaport Hovav (2015) point out, the choice between these two analyses depends on theoretical assumptions on the status of serial verbs and complex verbs. Since none of the languages under consideration here are of this type, I do not discuss the matter further.

a Co-Event component is going to be included in the sentence, it must be in some kind of sentential adjunct, such as a gerund or PP. Spanish is a canonical v-language, as shown in (25):

(25) La botella salió (flotando).
the bottle exited (floating)
'The bottle exited (floating).'

In (25), the verb *salió* 'exited' lexicalizes the path; the optional gerund *flotando* 'floating' provides the manner component, although in v-languages this component is often omitted.

Talmy (1985, 1991, 2000) stresses that this typology represents only the "characteristic" lexicalization pattern in a language; that is, an s-language will mostly show the s-framed pattern, but will occasionally have v-framed sentences, and vice versa. This is seen in English v-framed sentences like *John left*, parallel to (25). Similarly, Italian sentences such as (26) have been cited as exceptional, given that Romance languages are classified as v-framed (Iacobini and Masini 2007, p. 159):

(26) Il piccione è volato via.
the pigeon is flown away
'The pigeon took wing.'

Thus, Talmy treats the typology as describing tendencies within languages, rather than absolute rules. However, most generative analyses of the Framing Typology take a different approach in which v-framed patterns are expected to be possible in s-languages; on the other hand, the reverse is impossible, and apparent exceptions such as (26) prove to be v-framed constructions on closer inspection. Before discussing this, I present the theoretical account of the Framing Typology that I adopt in this paper.

Theoretical account

There are a number of different analyses of the Framing Typology available in the literature, taking a number of syntactic and semantic approaches. One common approach is to define the typology in terms of the possible meanings that can be encoded in P and other lexical items (see, among many others, Son 2007; Acedo-Matellán 2010; Beavers et al. 2010; Mateu and Rigau 2010; Real Puigdollers 2010, 2011; Son and Svenonius 2010; Troberg 2011; Acedo-Matellán and Mateu 2013; Troberg and Burnett 2016). While the details of the various accounts differ greatly, the common thread uniting them is the claim that in verb-framed languages, prepositions are unable to encode a bounded Path that can merge as a complement of V. Instead, prepositions in directed motion sentences may only encode locations, and so if they are to appear in this kind of sentence, the Path component of meaning must be encoded in the verb itself. However, recall that the goal of this discussion of the Framing Typology is to explain the crosslinguistic distribution of non-idiom IVPCs; therefore, I am concerned with finding an analysis that can be made to relate to IVPCs. While this Path-based approach has its theoretical merits, it is difficult to see how it can be extended to IVPCs. In English, IVPCs involve prepositions such as *on* and *with*, which cannot be seen as characterizing a Path; thus, it is difficult to see how the possibility of encoding Path in prepositions could be related to the phenomenon under discussion in this paper. Instead, what appears to be at stake is the possibility of combining a verb and preposition into a single predicate. To this end, I adopt the analysis of Gehrke (2008).

Gehrke (2008) provides an account of the Framing Typology that draws on Rothstein's (2004) event semantics and Snyder's (2005) Rule C, which allows the combination of two predicates into a single complex predicate.[16] In Gehrke's analysis, the kind of directed motion

[16]While I adopt Gehrke's (2008) analysis of the Framing Typology in most of its aspects, I remain agnostic as to whether Rule C is related to the Compounding Parameter, as is originally proposed by Snyder (2005) and assumed by Gehrke (2008) as well. As it is originally formulated, Rule C is a general rule of semantic composition that creates both endocentric compounds and complex events. Mateu and Espinal (2007), Son (2007), and Son and Svenonius (2010) show that a correlation between a language's status in the Framing Typology and the possibility of compounding does not hold in Slavic languages, Basque, and a number of other languages. Snyder (2012) claims that their objections do not constitute evidence that the Compounding

events relevant to the Framing Typology (i.e., those with bounded paths) are Accomplishments (in the sense of Vendler 1957; Dowty 1979), that is, events consisting of two components: an activity, and a resulting change of state undergone by the theme of the activity. Gehrke adopts the event template proposed by Rothstein (2004, p. 108) as a general denotation for accomplishment events:

(27) *Accomplishment event*

$\lambda y \lambda e.\exists e_1,e_2[e =^S (e_1 \sqcup e_2)$

$\wedge$ ACTIVITY$_{<x>}(e_1)$ $\wedge$ Ag(e_1)=x $\wedge$ Th(e_1)=y

$\wedge$ BECOME$_{<y>}(e_2)$ $\wedge$ Arg(e_2)=Th(e_1)

$\wedge$ INCR$(e_1,e_2,C(e_2))]$

In this definition, an accomplishment event involves an activity event with an Agent and a Theme and a BECOME event whose argument is the Theme of the activity; the two events are connected by an incremental relation, which is stated in terms of an incremental chain $C(e_2)$ on the BECOME event, which is defined by Rothstein (2004, p. 107) as in (28):

(28) *Incremental chain*

Let e be a BECOME event.

An incremental chain C(e) is a set of parts of e such that:

1. The smallest event in C(e) is the initial bound of e
2. For every e_1,e_2 in C(e) $e_1 \sqsubseteq e_2$ or $e_2 \sqsubseteq e_1$
3. $e \in C(e)$

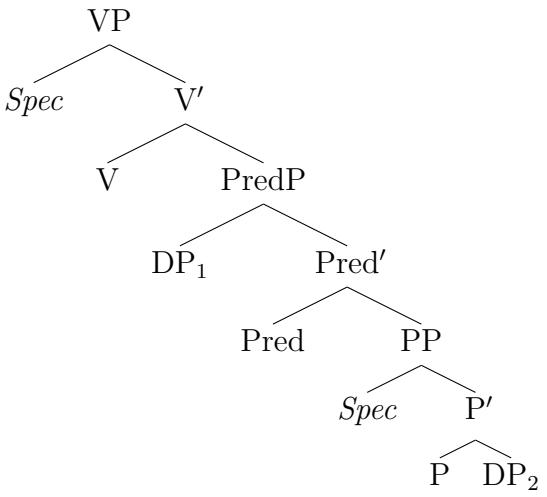
The two subevents involved can be equated to the Manner and Result components of verbal semantics as developed in Chapter 3. Thus, these incremental chains are related to the scalar structures associated with paths and scalar adjectives (see, among many others, Dowty 1979;

Parameter is not related to the Framing Typology, as there are multiple potential confounds that may blur the relationship between the two in individual languages. I consider this to be an open issue; however, as this chapter does not concern compounding itself, I abstract away from the issue here.

Tenny 1987; Jackendoff 1996; Krifka 1998; Rappaport Hovav and Levin 2005; Levin and Rappaport Hovav 2015). In Gehrke's analysis, this notion of incrementality is a part of the denotation of verbs of directed motion (whether or not the verb is a Result verb, i.e., whether it includes a BECOME event in its denotation), as well as in Path prepositions and scalar adjectives.

Finally, Gehrke's analysis incorporates Snyder's (2005) Rule C, which allows non-verbal predicates associated with incrementality to derive a BECOME event from an activity verb that does not itself include a BECOME component in its denotation. However, Gehrke implements this somewhat differently than Snyder. In Snyder's analysis, Rule C combines the activity event argument introduced by the verb with a BECOME event argument introduced by the PP. However, Gehrke follows Zwarts (2005) in assuming that directional PPs introduce an incremental (scalar) structure, but not an event argument – that is, they are atemporal, but spatial. In Gehrke's proposal, however, incremental non-verbal predicates can derive a BECOME event with activity verbs. In this case, they license a PredP projection that allows the PP to be embedded under the verb as a secondary predicate, resulting in the following structure (Gehrke 2008, p. 204):

(29)



In other words, the Pred head both introduces a BECOME event, and serves to glue this event and the event introduced by the verb into a complex event. This complex event is an accomplishment, which conforms to the semantic template in (27).

Returning to the Framing Typology, Gehrke (2008) proposes that s- and v-languages differ in the conditions under which these complex predicates can be built – that is, under which Pred, and its BECOME subevent, are licensed. In both s- and v-languages, they are licensed in cases where the verb itself provides an incremental structure in its denotation, even if BECOME itself is not included (i.e., even if the verb is not itself an accomplishment). The difference between the two types of languages is that s-languages can also license a BECOME event in cases where the incremental structure is present only in the PP, even when the verb itself has no incremental meaning; the operation by which this occurs is known as Rule C. This is not possible in v-languages. To put it another way, s-languages allow the formation of complex accomplishment predicates when an incremental structure is introduced by either the verb or the PP, while v-languages can only form accomplishments when the verb itself already has an incremental meaning. Neither type of language can license the formation of these complex events when an incremental structure is not provided by either the verb or the PP.

Gehrke's (2008) analysis accounts for the various data introduced in Section 4.4.2. First, since both types of languages allow the construction of complex predicates when the verb itself has an incremental meaning, both types of languages allow the path component of a motion event to be encoded in the verb. This is shown for the v-language Spanish in (25), repeated in (30), and for the s-language English in (31), where the verb *salió* 'exit' and its English equivalent encode both incrementality and a BECOME event (i.e., *exit* is an accomplishment):

(30) La botella salió (flotando).
the bottle exited (floating)
'The bottle exited (floating).'

(31) The bottle exited (floating).

On the other hand, since only s-languages can build complex predicates when incrementality is present only on the PP, only these languages can encode a bounded path in a "satellite". This is the case for the English example (32), where the verb *float* is a simple activity verb, encoding a manner of motion but not any path or incrementality, and the PP *into the cave* introduces incrementality in the form of a bounded path that ends in the cave. On the other hand, this reading is not available in Spanish; (33) has only a reading where the PP *en la cueva* 'in the cave' modifies the whole event (i.e., an event of floating takes place inside the cave), rather than imposing a path on the event (Gehrke 2008, p. 195):[17]

(32) The bottle floated into the cave.

(33) La botella flotó en la cueva.
the bottle floated in the cave
'The bottle floated inside (*into) the cave.'

Gehrke (2008) also accounts for the seemingly problematic data in (26), repeated in (34), in which a manner verb appears in a directed motion sentence in a v-language (Italian):

(34) Il piccione è volato via.
the pigeon is flown away
'The pigeon took wing.'

[17]The situation is complicated somewhat by the fact that v-languages often have prepositions meaning something like 'until' or 'up to' (e.g., Spanish *hasta*, French *jusqu'à*, Portuguese *até*), which can give an interpretation similar to that in s-framed constructions like (i). Aske (1989), however, shows that *hasta* does not induce telicity in the same way as goal phrases in s-languages; he argues that with these prepositions, the final location of the movement event is not asserted as in s-languages (although it may be implied). Gehrke (2008) argues that such prepositions put a temporal, rather than spatial, bound on the event. On the other hand, contrary to Aske's data, some Spanish speakers allow a telic interpretation with paths introduced by *hasta* (Andrés Salanova, p.c.), and Grolla (2004) reports a similar situation with Portuguese *até*. While this variation is puzzling and unexpected, its apparent inconsistency across speakers suggests that the situation is more complicated than these constructions being simply s-framed. However, a full account of 'until'-type prepositions is outside the scope of this chapter, and I will set them aside.

In the account of Talmy (1985, 1991, 2000), this kind of example is problematic, as the verb *volare* 'fly' encodes a manner of motion, and so it seems that the path must be provided by the "satellite" *via* 'away'. However, in Gehrke's (2008) account, this is straightforwardly explained if the verb includes a component of incrementality in its meaning, in addition to the manner component that is characteristic of activity verbs; this incremental structure is enough to license the formation of a complex predicate even if the verb itself is not an accomplishment with a BECOME subevent. In many languages (both v-framed and s-framed), a number of "manner" activity verbs can include (or be coerced into a sense in which they include) an incremental meaning. The set of verbs for which this occurs varies depending on the language, and can even vary between speakers within a language, as is expected for a point of lexical variation; however, there are limitations on this variation, with the verbs being generally restricted to those that are canonically associated with directed motion, such as *run, bounce, jump, fly,* and so on, but generally excluding such verbs as *float*, *bounce*, and *dance*. See Real Puigdollers (2010) for extensive discussion of this phenomenon across languages.

Thus, Gehrke's (2008) account of the Framing Typology treats the difference between the two types of languages in terms of the conditions under which a verb and a PP can combine to denote a single complex accomplishment event: s-languages allow this when there is an incremental meaning provided by either the verb or the PP (or both), while v-languages allow it only when the incrementality is provided by the verb. The connection between this complex event formation (Rule C) and the notion of idiosyncratic PP-complementation discussed in this chapter is not immediately clear, since the IVPCs (e.g., *rely on, wait for*) are not complex events in the same way as the directed motion events involved in the Framing Typology (i.e., they are not accomplishments). However, the idea that languages differ in terms of how they can combine verbs and PPs into a single event has a clear connection to IVPCs. I return to this issue in Section 4.5.

With this account of the Framing Typology in mind, I now return to the question of which languages have a pattern of IVPCs like that in English, and which have the more limited pattern of French.

4.4.3 Testing for l-selection

Recall that, while both French and English have idiom and DCA IVPCs, French differs from English in that it does not have non-idiom IVPCs. In this section I argue that this is not an accidental gap in French, but it results from a correlation between a language's status in the Framing Typology and the presence or absence of non-idiom IVPCs, such that s-languages have non-idiom IVPCs, and v-languages do not. I demonstrate this by looking at a selection of languages (Dutch, Russian, Finnish, Hungarian, Hebrew, Turkish, Arabic, Italian, and Basque) and showing that among those, the s-languages have non-idiom IVPCs, and the v-languages do not. For languages that demonstrably have them, it is fairly easy for linguists who can speak a language to come up with examples;[18] therefore, if specialists in a particular language cannot come up with examples of non-idiom IVPCs in their language, then I take that as evidence that that language, like French, does not have them. Therefore, the method for most of this section was an informal survey, in which I simply asked linguists familiar with the various languages whether or not their language has examples of verbs that select for a particular P (or, for some languages, a particular case), aside from the more functional, structural, dative- and genitive-like Ps or cases (which I assume are DCAs), to the exclusion of a bare/accusative DP; in other words, I focused on whether the language has non-idiom IVPCs, disregarding examples that fit the definitions proposed above for DCA or idiom IVPCs. When possible, I corroborated this with data from reference grammars. For Dutch and Hebrew, I supplemented data from my informants with information from

[18]To illustrate this point, when asked about l-selection in Hungarian, Kriszta Szendrői (p.c.) said that they can be found simply by looking up translations of West Germanic l-selecting verbs. Note that this (albeit anecdotal) point lends support to the claim in Section 4.3.2 that the selection of verbs that can take PP-complements is not random (contra, e.g., Neeleman 1997).

papers on l-selection (Neeleman 1997 for Dutch, Botwinik-Rotem 2004 and Botwinik 2013 for Hebrew).[19]

For each of the languages, I provide evidence for its status as a v- or s-language, in addition to evidence for the presence or absence of non-idiom IVPCs. It should be noted that the question of whether a language is v- or s-framed is sometimes controversial; disagreement over a language's status generally stems from one of two theoretical issues. The first is the question of whether the Framing Typology is viewed in formal, generative terms or from a more descriptive, typological viewpoint. The original formulation of the typology in Talmy (1985, 1991, 2000) takes the descriptive approach, such that a language is s-framed if Paths are "characteristically" expressed by satellites, and it is v-framed if it is characteristically expressed by the verb; this approach is taken by Berman and Slobin (1994), and Slobin (2004), and works cited therein, among many others. In this point of view, the occasional exception to the generalization (e.g., some s-framed constructions in v-languages, and vice versa) is unproblematic, and perhaps expected. On the other hand, in the formal approach, the Framing Typology is viewed not in terms of general tendencies of a language, but instead in terms of what is or is not possible in the grammar. Recall the discussion of Section 4.4.2, in which one such formal approach to the Framing Typology, that of Gehrke (2008), is outlined; there, it was pointed out that the contrast between v- and s-languages results from the (non)existence of a means of combining Manner-denoting verbs with Path PPs to form an accomplishment. In s-languages, this is possible, while in v-languages, it is not. From this point of view, s-languages are expected to have v-framed constructions (where the Path is expressed by the verb), but v-languages are not expected to have any s-framed constructions. Apparent exceptions, such as that in (34), in fact involve coercion of a Manner verb into a Path verb, which is only possible for a small subset of verbs, as discussed in Real Puigdollers (2010). As I take a formal approach to the typology, I consider the presence of s-framed constructions

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that cannot be ascribed to coercion to be a diagnostic of an s-language, regardless of the general tendencies or most characteristic type of construction in the language. As will be seen, this means that I consider Hebrew to be an s-language, despite the fact that it patterns with v-languages in terms of the frequency of v-framed constructions in discourse.

The other theoretical issue is one of granularity: in terms of v- versus s-framedness, is the verb as a whole to be considered, or just its root? Among the languages discussed here, this issue comes up with Russian, in which the Path is usually expressed by a verbal prefix on a verb root expressing the Manner of motion (the Path may be further specified in a PP as well). In Talmy's formulation of the typology, these prefixes are considered "satellites", and so Russian is an s-language (see, e.g., Talmy 2000; Slobin 2004; Acedo-Matellán and Mateu 2013). However, since the Path is expressed in the verb itself (albeit in a prefix), other authors (e.g., Snyder 2005, 2012; Gehrke 2008) refer to it as a v-language. In this paper I follow the former interpretation, due to the parallels stressed by those authors between Slavic Path prefixes and Germanic verb particles, which are canonical "satellites".

With this in mind, I present the results of the crosslinguistic survey below, followed by a summary and discussion. I discuss each language in turn; for each I provide evidence that classifies it as s- or v-framed, and some discussion of the possible IVPCs in the language. For the most part I will not be discussing DCA IVPCs (although it seems likely that these are present in some form in all of the languages), focusing instead on non-DCA IVPCs and determining whether they are idioms or not. Recall that non-idiom IVPCs are distinguished from idiom IVPCs in that the verb in a non-idiom IVPC has no interpretation when it does not appear together with a certain preposition. Before I begin, it should be noted that I am considering IVPCs to involve elements other than prepositions in certain languages; in many languages, the meanings expressed by the kinds of prepositions found in IVPCs in English (see Section 4.3.3) are expressed by postpositions or locative case markers, or by various

combinations of these; see Talmy (2000) and Acedo-Matellán (2010) for a similar view of these elements as "satellites" analogous to English prepositions and verb particles.[20]

S-languages

Here I discuss the s-languages Dutch, Russian, Finnish, Hungarian, and Hebrew. As mentioned above, the latter is generally considered to be a v-language; however, I show evidence below that it allows expressions of Path as the complements of Manner verbs in at least some cases; on the formal account of the Framing Typology taken above, this means that it is an s-language. All of these s-languages are found to have non-idiom IVPCs.

Dutch Like other Germanic languages, Dutch is an s-language, which can express the Path of a motion event with adpositions and separable verb prefixes. This can be seen in (35a), where the adposition *in* 'in(to)' appears with the manner verb *zwom* 'swam' as a postposition to give the sentence a directional meaning ('into'; see Koopman 2000; Gehrke 2008; Den Dikken 2010; Real Puigdollers 2010 for discussion of the syntax of Dutch adpositions), and in (35b), where the separable prefix *in* 'in' indicates the path of the 'handing' event (Gehrke 2008, p. 27):[21]

(35) a. Zij zwom het meer **in**.
she swam the lake in
'She swam into the lake.'

b. Zij diende een aanvraag **in**.
she handed a petition in
'She filed a petition.'

As for IVPCs in Dutch, there is much data given by Neeleman (1997), who uses the language (alongside English) to provide data on his study of "PP-complements", that is, IVPCs.

[20]A similar comparison is made by Asbury et al. (2006), who argue that locative case markers are of the category P, along with adpositions; however, I make no claims here as to the categorial status of the elements under consideration.

[21]In (35), the emphasis is in the original; in other examples in this and the following subsection, emphasis on the Path elements is added as in these examples.

Neeleman provides various examples of this throughout his paper, although he does not specify whether any of the Dutch PP-complement verbs are non-idiomatic IVPCs in the sense that the verb cannot take a complement of another category. In fact, he shows that at least two of the verbs, *vertrouwen* 'trust' and *geloven* 'believe', do take DP-complements in addition to their PP-complements, and so these are idiom IVPCs. However, Peter Ackema (p.c.) has provided examples of verbs for which, when they take a complement, it must be a PP headed by a specific preposition, including *lijken op* 'resemble', *rekenen op* 'count on', and *bestaan uit* 'consist of'. Therefore, Dutch has non-idiom IVPCs.

Russian As discussed above, Russian is an s-language by the definition taken here, in that it has a set of productive verb prefixes that can denote the Path of a directed motion event when they attach to Manner verbs. This can be seen in (36), where the prefixes *pri-* 'to' and *u-* 'away' attach to the Manner verb *exat'* 'drive', along with PPs expressing Goals, Sources, and so on, to denote events of directed motion (Gehrke 2008, p. 202):

(36) a. On **pri**-exal **v** Moskvu.
he TO-drove.PF in Moscow.ACC
'He arrived in Moscow.'

b. On **u**-exal **iz** Moskvy.
he AWAY-drove.PF out Moscow.GEN
'He left Moscow.'

Russian is another language that has been used to exemplify l-selection (or PP-complementation) in various studies; as mentioned previously, Pesetsky (1991) uses the Russian example *zaviset' ot* 'depend on' to illustrate the idiomaticity of the choice of preposition in l-selection across languages (the preposition *ot* translates to 'from'), and Botwinik (2013) cites this and other examples from Russian in her study as well, although again neither author addresses whether these examples are idiom or non-idiom IVPCs. My informants have provided other examples as well, such as *polagatjsja na* 'rely on', *izbavitjsja ot* 'get rid

of', and *uklonjatjsja ot* 'avoid', and confirmed that for these verbs, a DP-complement is not available. Therefore, Russian also has non-idiom IVPCs.

Finnish In Finnish there is a rich system of cases that perform most of the locative and directional functions of prepositions in languages like English; Acedo-Matellán (2010) shows that these cases, in addition to adverbial particles, play the role of satellites in the language, citing examples such as (37) (Acedo-Matellán 2010, p. 232, attributed to Fong 2001 and Kolehmainen 2005, p. 170).[22]

(37) a. Toini tanssi huonee-**seen**. / huonee-**sta**.
Toini danced room-ILL room-ELA
'Toini danced into/out of the room.'

b. Uolevi asui täälä, mutta hän muutti **pois**.
Uolevi live.PST here but he move.PST away
'Uolevi has lived here, but he has moved away.'

Finnish has many verbs that select for a case besides accusative; many of these select partitive case, which I exclude here, since partitive case is known to have predictable aspectual effects in Finnish (see, e.g., Kiparsky 1998; Borer 2005b). However, there are also verbs that require complements inflected for locative cases. These include illative, as in *luottaa johonkin* 'trust (into) something', and elative, as in *tykätä jostakin* 'like (from) something'. Finnish, then, also has *rely*-type IVPCs.

Hungarian Like Finnish, Hungarian has a rich set of locative cases that play the role of satellites in the language.[23] These locative cases, along with a set of separable verb prefixes, may occur with non-Path verbs to express the Path in a directed motion event,

[22]Finnish also has a limited set of adpositions, but they do not appear to be involved in IVPCs.

[23]Also like Finnish, Hungarian has a set of locative postpositions in addition to its cases. It is unclear whether these are involved in l-selection. An informant provided the example *kiáll Péter mellett* 'stand up for Peter (literally, stick.out Peter near)', but this appears more like an idiomatic verb-PP combination, like its English translation, than a *rely*-type IVPC.

demonstrating that Hungarian is an s-language ((38a) is from Gehrke 2008, p. 202, (38b) from Acedo-Matellán 2010, p. 233):

(38) a. Mari **be**-táncolt a szobá-**ba**.
Mary into-danced the room-into
'Mary danced into the room.'

b. János **át**-jött.
János over-came
'János came over.'

Examples of verbs selecting a particular locative case in Hungarian include the following (example (39b) is adapted from Komlósy 1994, p. 94):

(39) a. bízik Péter-ben
trust Peter-INESSIVE
'trust in Peter'

b. függ Péter-től
depend Peter-ABLATIVE
'depend on Peter'

Neither of these examples allows a complement that does not have a locative case. Thus, Hungarian, too, has *rely*-type IVPCs.

Hebrew As mentioned above, Hebrew is generally taken to be a v-language (e.g., Talmy 1991, 2000; Berman and Slobin 1994; Slobin 2004; Gehrke 2008); for instance, Berman and Slobin (1994) and Slobin (2004) demonstrate that when expressing directed motion events in a narrative, speakers almost exclusively use verbs that express the Path of motion instead of Manner verbs. However, the following examples show that s-framed constructions, where the verb expresses the Manner and a preposition expresses the Path of motion, are possible in the language ((40a) is adapted from Beavers et al. 2010, p. 361, and (40b) from Son 2007, p. 140):

(40) a. Ha-kelev zaxal **la**-meluna.
the-dog crawled to.the-doghouse
'The dog crawled into the doghouse.'

b. Ha-bakbuk caf **el** **mitaxat** la-gesher.
the-bottle floated ALL under to.the-bridge
'The bottle floated (to) under the bridge.'

Recall that on a formal analysis of the Framing Typology, s-framed constructions such as those in (40) are simply unavailable in v-languages; thus, the presence of grammatical s-framed constructions in Hebrew shows that it is an s-language, despite the fact that in discourse it demonstrates patterns of verb use that are characteristic of v-languages. As for IVPCs in the language, an extensive study of Hebrew PP-complementation is performed in Botwinik-Rotem (2004) and Botwinik (2013). The author gives numerous examples of verbs that select for the prepositions *be-* 'in, at', *al* 'on', *le-* 'to, for', and *me-* 'from/of' (Botwinik 2013, pp. 128-129, 146). A non-exhaustive list of 70 such verbs is provided in Botwinik-Rotem (2004), in which she notes that only five of these verbs can also take a DP-complement; furthermore, only a small number of these alternate with a CP-complement (Irena Botwinik, p.c.). Thus, Hebrew exhibits non-idiom IVPCs.[24]

V-languages

Here I look at the v-languages Arabic, Italian, Turkish, and Basque. The first three pattern like French in lacking non-idiom IVPCs. The same appears to hold for Basque, although the situation is complicated by a number of verbs that take complements headed by deverbal nouns, with clausal meanings. Since this appears to be a separate phenomenon from the IVPCs discussed here, I conclude that Basque, too, lacks non-idiom IVPCs.

[24]The number of non-idiom IVPCs in Hebrew appears to be significantly larger than that in English. This may seem odd, considering the language's tendency toward v-framed constructions in use. However, it does not pose any theoretical problem. The correlation noted in this section is one between the *possibility* of s-framed constructions in a language (i.e., whether or not it is an s-language) and the *possibility* of non-idiom IVPCs; the amount or relative frequency of either construction is not relevant as long as they are present in the language.

Arabic It is claimed by Talmy (1985, 1991, 2000) that the Semitic languages are v-languages. Above I showed that this is not the case for Hebrew on the current analysis; however, the claim does seem to hold for Arabic. When asked for translations of *John danced into the room* and *The bottle floated into the cave*, Saleh AlQahtani (p.c.) noted that direct translations are unavailable, instead offering paraphrases. Similarly, (41) is reported to be possible but not widely attested in Standard Arabic, as expected for an easily coercible verb like 'run' in a v-language (Mateu and Rigau 2009; Real Puigdollers 2010):

(41) ʔasraʕa jōn ila ʔas-soog.
ran John to the-market
'John ran to the store.'

Thus, Arabic appears to be a v-language. In contrast to the languages examined above, Arabic patterns with French in evidently lacking non-idiom IVPCs. Like French, it has idiom IVPCs. For instance, while the expression *jaʕtamid ʕala* translates to 'rely on', the verb *jaʕtamid* without the preposition is a transitive verb meaning 'approve':

(42) a. ʔal-modēru sa-jaʕtamid ʕala ʔat-taqrēr
the-manager will-rely on the-report
'The manager will rely on the report.'

b. ʔal-modēru sa-jaʕtamid ʔat-taqrēr
the-manager will-approve the-report
'The manager will approve the report.'

However, there appear to be no verbs that require a specific, idiosyncratic preposition and that cannot also take a DP-complement; in other words, despite its close relation to Hebrew, Arabic is a v-language that lacks non-idiom IVPCs.

Italian The status of Italian in the Framing Typology has been the topic of some debate. As discussed in Section 4.4.2, it has some verb particles that appear in directed motion sentences; however, as argued in Mateu and Rigau (2009), these are instances of the verb

being coerced into a Path denotation. Crucially, directional particles are not possible with less coercible verbs such as *danzare* 'dance' (Mateu and Rigau 2009, p. 243):

(43) *Gianni è danzato via.
Gianni is danced away
'Gianni danced away.'

Thus, Italian is a v-language. In terms of IVPCs, it shows an almost identical pattern to that in French. As in French, there are idiom IVPCs, such as *contare su (di)* 'count on' (literally 'count on (of)'). In addition, also as in French, there are verbs that require a PP-complement headed by *a* 'at, to' or *di* 'of, from' (e.g., *ubbidire a* 'obey', *(as)somigliare a* 'resemble', *fruire di* 'enjoy the use of', *profittare di* 'profit from, take advantage of'; these examples and translations are from the *Collins Italian Online Dictionary*). Given the similarity in form and meaning between these examples and the French examples in Section (20), I assume that these are DCA IVPCs, and that Italian lacks non-idiom IVPCs.

Turkish Turkish patterns as a v-language, as discussed by (Özçalışkan 2004; Slobin 2004), although like Italian it allows coercion with a relatively wide range of verbs normally construed as verbs of manner of motion. Thus, while verbs like *koş-* 'run' allow a bounded path interpretation (44a), this interpretation is not available for *dans et-* 'dance' (44b):

(44) a. John market-e koş-tu.
John store-DAT run-PST.3SG
'John ran to the store.'

b. *Adam kapı-ya dans etti.
man door-DAT danced
'The man danced to the door.'

As for IVPCs, Turkish is like Finnish and Hungarian in expressing locations and paths using locative cases; however, unlike the latter languages it does not appear to have any verbs that idiosyncratically select one of these locative cases to the exclusion of other kinds of

complement. Two potential counterexamples are the verbs *kuşkulan-* 'suspect' and *hoşlan-* 'like', both of which require complements with ablative case. However, for both of these verbs the complement can be interpreted as a Source (i.e., the thing causing suspicion or being liked), a role that is generally associated with the ablative case in Turkish. Thus, it is likely that these are not idiosyncratic at all. While further research is needed to determine the extent to which the distribution of ablative case is predictable in the language, Turkish appears to fit the pattern of v-languages lacking non-idiom IVPCs.

Basque The situation in Basque is somewhat more complicated, but it appears not to have non-idiom IVPCs either. Basque is another language in which locative relationships are generally expressed by case endings rather than adpositions. Like French and Arabic, it has verbs that take particular cases (usually inessive) for certain meanings, but in each case the verb can also be intransitive or take an object in absolutive case (the normal case for a direct object in Basque, an ergative language). There are also verbs that select for instrumental (*aspertu* 'get bored', *damutu* 'regret'), adlative (*behartu* 'force', *animatu* 'encourage') or genitive locative (*eskatu* 'ask for') case; however, these all require the objects to be nominalized verbal predicates, which have a clause-like meaning and so seem to be a separate phenomenon. Therefore, while this seems like the same sort of idiosyncratic selection that is characteristic of IVPCs, it involves a distinct set of verbs and complements than the other instances of the phenomenon discussed in this chapter (see Section 4.3). For this reason, I assume that Basque lacks *rely*-type IVPCs in the sense developed in this chapter, although I leave the question open as to whether the phenomenon found in Basque is a subtype or relative of idiosyncratic PP-complementation.

Summary

In the languages investigated here, a two-way correlation between the framing typology and IVPCs emerges: s-languages all have non-idiom IVPCs, while v-languages all appear to

lack them (although as mentioned above, further research is needed to fully understand the situations in Turkish and Basque). Thus, the absence of non-idiom IVPCs in French is not an isolated case of an accidental gap in the language; it is not the case that French simply lacks the equivalent of verbs like *rely*, which necessarily take an idiosyncratic, non-DCA PP-complement to the exclusion of other kinds of complement. Instead, non-idiom IVPCs as defined in Section 4.2.3 constitute a natural class in their own right, and this class is unavailable in v-languages. In the following section, I propose an analysis of non-idiom IVPCs that accounts for this restriction.

4.5 IVPCs as complex predicates

In this section I propose an analysis of non-idiom IVPCs that accounts for their cross-linguistic distribution. I propose that they result from embedding a locative predicate under a stative (or in some cases, perhaps activity) predicate. I adopt the analysis of complex predicates proposed by Neeleman and Van de Koot (2002), though I depart from them in allowing a wider range of predicates to be embedded under states. I also propose that the embedding structure needed for non-idiom IVPCs, as well as many of the other complex predicates allowed under Neeleman and Van de Koot's (2002) analysis, are the result of the application of Rule C, and so they form the class of structures that are disallowed in v-languages. First, I provide a brief introduction to the theory of simple and complex predicates, and the rules for mapping them to syntax, that is put forth in Neeleman and Van de Koot (2002), abstracting away from many details of the constraints and the mapping rules that are irrelevant to the current chapter.

Neeleman and Van de Koot (2002) outline a theory of the structure and formation of predicates that generates a limited number of possible kinds of semantic predicate. They propose that a simple predicate must introduce either one or two arguments, and that there are three ontological types of arguments: states, activities, and locations. Furthermore, one

predicate may be embedded within another, with the embedded predicate taking the place of the second argument of the embedding predicate. Various constraints limit the combinations possible in these derived predicates, which are mostly irrelevant to the current discussion. This makes possible the simple predicate types given in (45) and the derived predicate types in (46), which are shown along with some representative members of each class (adapted from Neeleman and Van de Koot 2002, p. 360, pp. 367–368):

(45)
a. $\lambda x\ [_{ST}\ x]$ — exist, green, intelligent
b. $\lambda x\ \lambda y\ [_{ST}\ x\ y]$ — know, see, understand
c. $\lambda x\ [_{ACT}\ x]$ — laugh, shake, work
d. $\lambda x\ \lambda y\ [_{ACT}\ x\ y]$ — kiss, hit, stroke
e. $\lambda x\ \lambda y\ [_{LOC}\ x\ y]$ — contain, have, in, into, out of

(46)
a. $\lambda y\ \lambda x\ [_{ACT}\ x\ [_{ST}\ y]]$ — break, paint, anger, impress
b. $\lambda y\ \lambda x\ [_{ACT}\ x\ [_{ACT}\ y]]$ — boil, shake, rattle
c. $\lambda y\ \lambda x\ [_{ST}\ x\ [_{ST}\ y]]$ — like, hate, fancy
d. $\lambda z\ \lambda y\ \lambda x\ [_{ACT}\ x\ [_{ST}\ y\ z]]$ — show, teach, tell
e. $\lambda z\ \lambda y\ \lambda x\ [_{ACT}\ x\ [_{LOC}\ y\ z]]$ — hand, give, throw

Any predicate, simple or derived, is interpreted as a single eventuality. In derived predicates as in (46) where the upper predicate is an activity, the interpretation is of the argument x acting upon an argument y (introduced by the lower predicate) with the result that the property denoted by the lower predicate obtains of y. Thus, transitive *boil* is interpreted as one participant acting on another such that the second participant boils. In those where the upper predicate is a state, it is interpreted as the argument x experiencing y (in the lower predicate) as having the property expressed by the lower predicate; thus, the meaning of *like* involves one participant experiencing the other as likeable. This interpretive rule, such that the experiencer perceives some state of affairs to hold, is claimed to bar states

from embedding non-stative predicates: Neeleman and Van de Koot (2002, p. 370) claim that "[a]lthough humans classify states as either factual or perceived, locations and entities seem to be uniformly classified as factual", and so they may not act as arguments of stative predicates. However, in the discussion below, I argue that this is not always the case.

As can be seen by the examples given for each one, each of the predicate types in (45)-(46) may be the expressed by a single lexical item. In addition, Neeleman and Van de Koot's (2002) system allows for the formulation of complex predicates that combine the denotations of a verb and an AP or PP complement. This is possible as long as the embedded phrase is a sister to the verb (or a projection of the verb), and only if the resulting structure does not violate the various constraints on derived predicates. An unergative activity verb (including optionally transitive verbs with the object omitted) may combine with location predicates to form a complex predicate denoting an event of directed motion, or with stative predicates to derive a resultative predicate; these are schematized, along with examples, in (47). Similarly, verbs that include embedded predicates in their lexical representation may embed predicates of the same type as the embedded ones, as in (48) (adapted from Neeleman and Van de Koot 2002, pp. 393–395):

(47) a. λ y [$_{\text{ST}}$ y], λ z [$_{\text{ACT}}$ z] $\rightarrow$ λ y λ z [$_{\text{ACT}}$ y [$_{\text{ST}}$ z]]

e.g. John worked his hands bloody.

b. λ y [$_{\text{LOC}}$ y], λ z [$_{\text{ACT}}$ z] $\rightarrow$ λ y λ z [$_{\text{ACT}}$ y [$_{\text{LOC}}$ z]]

e.g. Charles drank himself into the hospital

(48) a. λ x [$_{\text{ST}}$ x], λ y λ z [$_{\text{ACT}}$ y [$_{\text{ST}}$ z]] $\rightarrow$ λ y λ z/x [$_{\text{ACT}}$ y [$_{\text{ST}}$ z/x]]

e.g. John broke the vase into pieces.

b. λ x [$_{\text{LOC}}$ x], λ y λ z [$_{\text{ACT}}$ y [$_{\text{LOC}}$ z]] $\rightarrow$ λ y λ z/x [$_{\text{ACT}}$ y [$_{\text{LOC}}$ z/x]]

e.g. John sent the package to America.

The final kind of complex predicate that Neeleman and Van de Koot (2002) are stative; they claim that this is possible with certain stative verbs, such as *consider*, which take small-clause predicates, under the conditions schematized in (49):

(49) λ x [$_{ST}$ x], λ y λ z [$_{ST}$ y [$_{ST}$ z]] $\rightarrow$ λ y λ z/x [$_{ST}$ y [$_{ST}$ z/x]]
e.g. John considers Mary nice.

Neeleman and Van de Koot (2002) get their data and examples from Dutch and English, both of which are canonical s-languages; they do not discuss whether or how complex predicate formation may differ across languages. However, I propose that the difference between v-languages and s-languages can be stated in terms of their theory. Recall from Section 4.4.2 that s-languages are distinguished from v-languages by allowing (pure) manner verbs to appear in directed motion sentences with a PP (or other element) denoting the goal of motion, or in AP resultatives. These are the structures in (47). On the other hand, both types of languages allow goal PPs with verbs that encode the Path component, and result APs with certain verbs that denote changes of state (e.g., *become*). In terms of the theory outlined above, then, it appears that derivations of the type in (47) are disallowed in v-languages, while they are possible in s-languages. To put this in the terms of the analysis adopted in Section 4.4.2, Rule C is the rule that allows the type of complex predicate formation in (47), in which the verb denotes an activity and the embedded predicate is supplied entirely by its complement.

With this in mind, we now turn to non-idiom IVPCs. Consider again the examples in (50):

(50) depend on, rely on, toy with, comply with

I propose that in each of these examples, the verb on its own denotes a monadic predicate, either a state or activity (depending on the verb), and the PP denotes a state, or perhaps a

locative predicate (though only with a somewhat abstract interpretation of the preposition's normal locative meaning, in the sense outlined in Section 4.3.3). This analysis, along with the above discussion of Rule C, accounts for the absence of these non-idiom IVPCs in v-languages: Rule C allows an intransitive verb to embed a predicate provided by XP complements, which includes non-idiom IVPCs in this analysis.

This analysis raises the question of why the verbs in (50) generally cannot appear as intransitive verbs, as is generally possible with monadic predicates. I argue that this is simply because they are caboodle items (Harley 2014), in the sense discussed above in Section 4.2.3 – that is, lexical items that cannot appear outside of a particular idiom, or syntactic frame. They differ from typical caboodle items, such as *caboodle* itself in English (from the idiom *the whole kit and caboodle* 'everything') or *leu-leu* in French (from *à la queue-leu-leu*, 'in single file'), in that they must necessarily form a complex predicate with their PP complement. Since the verb is never seen outside of the IVPC, I argue that its contribution to this complex predicate is monadic, only contributing the part of meaning that is not expressed by the PP complement. Thus, they are only possible in languages that allow this kind of complex predicate, the s-languages.

With non-idiom IVPCs disallowed in v-languages because they require Rule C, the question arises as to why idiom and DCA IVPCs are possible in those languages. I propose that they do not require Rule C. Specifically, I claim that these two types of IVPC involve verbs that are not monadic predicates, but are instead transitive; thus, their complex predicates are derived as in (48) and (49), which do not require Rule C, rather than as in (47), which does. For DCA IVPCs, this is likely a case of a verb being a transitive predicate that happens not to assign the usual objective case, requiring a DCA to license the complement (although as discussed in Section 4.2.1, there may be regularities as to when DCAs are necessary in a language). For idiom IVPCs, the verbs in their non-idiom usage take some (DP or CP) complement; thus, the formation of a complex predicate with a PP-complement does not involve Rule C. It appears likely that the lexical representation contributed by the verb in an

idiom IVPC is somewhat different from that of the verb outside of idiomatic contexts. For example, the verb *count* likely projects a simple binary activity predicate with no embedding, while the expression *count on* appears to have the same kind of representation as *rely on*; the embedded predicate projected by the PP takes the place of the second argument variable contributed by the verb. While this kind of substitution of an argument variable for an embedded predicate does not appear to be discussed as a possibility by Neeleman and Van de Koot (2002), I propose that it is possible, though it appears to be restricted to idiomatic contexts.

Another difference between this analysis and Neeleman and Van de Koot's (2002) is that the current analysis appears to involve the embedding of locative predicates by states in complex predicates. Recall that in their analysis, this is ruled out by the principle governing the interpretation of embedding stative predicates, which involves the first argument perceiving or experiencing the state of affairs denoted by the lower predicate as true. All of the binary stative predicates that they discuss are psychological predicates, for which this generalization does seem to hold. However, at least some of the non-idiom IVPCs in (50) (and likely other IVPCs as well) denote states; for example, neither *depend, rely,* nor *comply* denotes a dynamic eventuality, in the sense that none necessarily involve any kind of change or movement over the course of the event. For at least some of these (particularly *depend on* and *rely on*), as discussed in Section 4.3.3, the preposition denotes some force-dynamic relationship which is closely related to its locative meaning. Therefore, it seems natural to classify the PPs as locative predicates, in violation of Neeleman and Van de Koot's (2002) claims. It may be that this is possible in instances where the PP has only a fairly metaphorical extension of its locative meaning, or perhaps that it is possible only in non-psychological predicates where the subject is not an Experiencer (e.g., with *rely on*, the subject appears to be more of a Theme that is (metaphorically) located with respect to the complement of *on*, rather than an Experiencer), or a combination of these factors. Another option is that despite the relationship between these PPs and locative *on*, the embedded predicate in *rely on* and

similar examples is, in fact, a state, as is the case with *into pieces* in (48a) above. Whatever the reason, this divergence does not seem like a far stretch from the analysis of Neeleman and Van de Koot (2002).

To sum up the section, I have proposed an analysis of IVPCs that accounts for the absence of non-idiom IVPCs in v-languages. I adopt the account of complex predicate formation from Neeleman and Van de Koot (2002), and claim that some of the derived complex predicates allowed in their system (namely, those in which a verb projecting a monadic predicate embeds another predicate provided by its XP complement) requires Rule C (Snyder 2005, 2012; Gehrke 2008; Section 4.4.2) and so is absent in v-languages. I further claim that IVPCs involve complex predicates, but only those in non-idiom IVPCs involve the type of complex predicate requiring Rule C, which explains why these (but not other IVPCs) are absent in v-languages.

4.6 Conclusion

In this chapter I have taken a close look at idiosyncratic verb-preposition combinations (IVPCs) from a theoretical and typological standpoint. In keeping with the rest of this thesis, this chapter has demonstrated that this phenomenon does not show the properties that one would expect if it were due to arbitrary features stored in the lexical entries of verbs (i.e., l-selectional features). I have shown that IVPCs fall into three types (idiom IVPCs, non-idiom IVPCs, and DCA IVPCs), and that each shows regularities in the verbs and prepositions involved that suggest that they are not as unpredictable and idiosyncratic as is often assumed. Instead, the set of verbs that will be involved in IVPCs, and the prepositions that may appear with a given verb, are predictable from the semantics of the verb and the preposition, in terms of the thematic properties of their arguments. Furthermore, I demonstrated using a crosslinguistic survey that while idiom and DCA IVPCs appear to be present in all languages, non-idiom IVPCs are systematically absent in verb-framed languages. I proposed an analysis

of IVPCs that involved applying Neeleman and Van de Koot's (2002) theory of complex predicate formation to Talmy's (1985; 1991; 2000) Framing Typology, in which IVPCs are complex predicates with the predicate denoted by the PP embedded under that provided by the verb. For non-idiom IVPCs, the verb projects a monadic predicate, and so the derivation of their complex predicates involve Rule C, which is possible in s-languages but not in v-languages. On the other hand, the other kinds of IVPC involve complex predicate derivations that do not require Rule C.

This analysis allows the syntactic, semantic, and distributional properties of IVPCs outlined in this section to be accounted for in a way that predicts that some apparent idiosyncrasy (both in their distribution across the vocabulary and in the verb-preposition combinations that result), but this is constrained in ways that are unexpected under the traditional analysis of IVPCs as involving arbitrary l-selectional features. Therefore, I have provided an account for IVPCs that does not require arbitrary selectional features or other factors of the narrow syntax, but is instead systematically related to the semantics of the verbs and prepositions involved and rules of semantic composition that are independently necessary and typologically restricted.

Chapter 5

Conclusion and Future Research

5.1 Summary and conclusion

In this thesis I have defended the claim that selectional restrictions do not need to be lexically stipulated, but instead are predictable based on the semantic properties of the lexical items involved. I have of course not conclusively shown this, as such a universal claim would require explanations for countless problematic cases. Instead, I have selected some case studies of well-known alternations which have been argued to be arbitrary, and shown that principled semantic explanations are available for each one. In this way, I hope to have shown that explanations in a similar spirit are plausibly available for the remaining cases. Thus, my aim is to provoke further research in a line of research that aims to show that selectional features are not needed in the grammar for any predicates, and instead that selectional restrictions are predictable from the meaning of predicates, combined with principles of cognition and argument realization.

After a brief review of the literature on selection, focusing on the division of selection into c(ategorial)-selection, s(emantic)-selection and l(exical)-selection by Grimshaw (1979, 1981), and Pesetsky (1982, 1991), the main goal of Chapter 2 was to show that the properties that get selected for can be described in semantic terms, and that this can account for selectional

asymmetries between clausal and nominal complements without the potential overgeneration resulting from syntactic accounts. Bruening (2009) and Bruening et al. (2018) observe that predicates taking clausal complements often select for properties of heads high in the clause, but never for those of the verb itself, while those taking nominal complements can select for properties of the noun itself; under the assumption that selection targets features of the nearest XP projection, the authors conclude that clauses are headed by the high functional head C while nominal elements are headed by the lexical head N itself, rather than D or another functional head. I propose a system of extended projections in which the clausal projection is divided into two semantic domains, while the nominal projection is just a single domain. These domains correspond to the classic phases, such that DP expresses a description of an object or thing, vP (or more accurately, AspP) expresses a description of an eventuality, and CP expresses a propositional meaning, and introduces an assertion, question, or other speech act in the discourse. I claim that selection itself occurs at the point at which the phase including the selecting predicate and (the top phases of) its argument(s) is transferred to the semantic interface, thus rendering anything below the nearest phase inaccessible to the selecting predicate. This allows the observed locality constraints on selection to be explained without requiring selection to occur in the narrow syntax and without any direct reference to syntactic features or structures in the selectional restrictions themselves. I also propose that the order of heads within an extended projection can be characterized in terms of the way the semantic object expressed by the projection is constructed, without the need for c-selection to determine the functional sequence.

In Chapter 3 I turned to phenomena classically analyzed as involving c-selection, providing an account for the problematic case of *eat* and *devour*. I showed that the two words crucially differ in their aspectual properties: *devour* requires that the Theme argument be completely affected by a scalar change in the event (i.e., it is completely consumed by the end of the event), while *eat* does not. This is part of a general system where the meaning components of Manner and Result, interpreted here in roughly the sense of Rappaport Hovav and Levin

(2010) and Beavers and Koontz-Garboden (2012) as entailments of agentive causation and complete scalar change (respectively), determine whether the internal and external arguments of an event will be obligatory or optional. So, if a verb expresses Manner, as with unergatives and verbs of consumption, the Agent must be present, and if it expresses Result as with change-of-state verbs, the Theme (the object undergoing the scalar change) must be present. I show that *devour* expresses both Manner and Result, meaning that both of its arguments are required, while *eat* expresses only Manner, so only the Agent is obligatory. I show that this account also works for other verbs for which the object cannot be omitted, such as verbs of manner-of-killing. Thus, the selectional properties of the verbs under investigation need not be stipulated, but can instead be predicted based on their semantics.

In Chapter 4 I investigated data often analyzed in terms of l-selection, specifically the phenomenon of idiosyncratic verb-preposition constructions (IVPCs), such as *rely *(on)*. I show that these can be divided into three types. The first type are idiom IVPCs, in which the verb has other complementation options, but takes on a special meaning when it occurs with a complement headed by a specific preposition, as with *believe in*. The second are non-idiom IVPCs, in which the verb can take no other kind of complement besides that headed by a specific preposition, as with *rely on*. The third involve Dummy Case Assigners (DCA IVPCs), in which the verb, for whatever reason, cannot assign accusative case and so some dummy preposition (in English, *to* or *of*) is needed to license the complement. I show that the sets of verbs involved in IVPCs share certain thematic properties, taking complements that cannot be characterized as canonical patients, and that the selected preposition must be compatible with the thematic interpretation of the verb. In other words, the sets of verbs and prepositions involved in IVPCs are not arbitrary, but are instead (partially) predictable based on their semantics.

I then show that, while all languages appear to have idiom and DCA IVPCs, not all have non-idiom IVPCs. I show that the languages lacking non-idiom IVPCs are the verb-framed languages in Talmy's (1985; 1991; 2000) Framing Typology, while satellite-framed

languages do have non-idiom IVPCs. To explain this correlation I adopt an account of the Framing Typology inspired by that of Gehrke (2008), according to which there is a process of semantic composition known as Rule C which allows activity predicates (which lack any incremental structure in their semantics) to combine with resultative XPs that is available in satellite-framed languages but lacking in verb-framed languages. I show that if this is generalized to allow the formation of complex predicates when the verb is a monadic predicate (in the sense of Neeleman and Van de Koot 2002), then it can account for the distribution of non-idiom IVPCs as well: they involve the formation of a complex predicate in which the verb itself is a monadic predicate, as evidenced by the fact that they cannot take direct objects otherwise, and this is therefore impossible in languages in which Rule C is unavailable (i.e., in verb-framed languages). Thus, I provide a principled account for the mechanism behind IVPCs that accounts for its distribution within and across languages without the need for stipulated selectional features.

In sum, I have provided principled semantic explanations for a range of facts of selection that were previously considered to be arbitrary and stipulated as selectional features. As I have discussed, I do not claim that this proves that selectional features do not exist; to truly defend a universal claim such as that, one would need to find a principled account for every single case of selection. Instead, I hope to demonstrate the kind of explanation that is available for these phenomena, and provide a proof-of-concept for a line of research aimed at eliminating the remaining cases. As the set of phenomena for which selectional features are appealed to becomes smaller and smaller, it becomes more and more plausible that the rest will receive similar kinds of explanation.

If this approach is correct, then it allows for an overall simplification of the lexicon, since selectional features no longer need to be specified on a verb-by-verb basis. Instead, the selectional properties of predicates come for free if the lexical semantics are known. This serves to constrain the expressive power of the grammar as a whole, reducing the possibility of overgenerating and allowing selectional restrictions beyond those that are observed in

language. It also increases the learnability of the grammar; if selectional restrictions are the result of a combination of lexical semantics and general constraints on argument realization and other independently-needed principles, then children do not need to separately learn the selectional properties of each individual lexical item. Thus, eliminating selectional features leads to a more streamlined and adequate grammar in a number of respects.

5.2 Future research

Given that this thesis has involved a collection of related case studies on selection, there are multiple lines of research that can build on the claims made here. One line of research involves providing principled accounts for remaining cases of predicates whose selectional restrictions seem arbitrarily specified, and do not follow from their semantics. These include some that were touched upon over the course of this thesis. For example, in Chapter 2 there is some discussion of how to predict whether verb will take DP complements interpreted as concealed questions and propositions, versus those that take only CP complements. Nathan (2006) provides the beginnings of an explanation for these verbs, but leaves some cases unaccounted for, and there are questions in this regard that still appear to be unresolved. Furthermore, while this thesis has not had much discussion of selection for various kinds of CP complements (e.g., questions versus exclamations versus propositions; factive versus non-factive; indicative versus subjunctive; finite versus nonfinite), there remain many questions in this area regarding how to predict what kind(s) of CPs a given predicate can select for. Another example is the contrast between *during* and *while*; both indicate a span of time corresponding in some way to their complement, but the former takes only DP complements while the latter only CPs.[1] If the central hypothesis of this thesis is correct, all of these cases, and other like them, have principled explanations, such that the selectional constraints of the predicates in questions are predictable from their semantics. However, the exact analyses of many of these have yet to be found.

[1]Thanks to Caroline Heycock for pointing out this puzzle to me.

Aside from that, there are questions that arise from the analyses in the various chapters that are thus far unanswered as well. In Chapter 2 I proposed that clausal and nominal projections are sectioned into semantic domains that correspond to phases. However, there are still questions to be answered; for instance, while I have claimed that the (seemingly-syntactic) properties of the domains that get selected for have semantic correlates, and it is these correlates that get selected for, I have for the most part not been explicit about the semantic nature of these properties. Furthermore, it seems likely that there are other domains as well, such as AP (for property descriptions) and PP (for locations and paths); whether these behave like those I have discussed remains to be seen. Finally, I have argued, based on recent research on functional sequences, that the internal structures of extended projections can be accounted for semantically. However, while great strides have been made in this area in recent years (e.g., Borer 2005a,b; Ramchand 2008, 2018; Ramchand and Svenonius 2014), many questions remain unanswered in this regard.

In Chapter 3 I proposed a theory of argument realization that links the possibility of argument omission to whether or not verbs specify Manner and/or Result. However, since only a relatively small set of verbs were addressed in that chapter, it remains to be seen whether this analysis works for all (dynamic) predicates. For instance, I did not address unergative verbs; these do not allow the external argument to be dropped, suggesting that they are Manner verbs, and yet many of these do not in any obvious way entail agentive causation, including *glow, shine,* and *babble* (the "theme unergatives" of Reinhart 2002, 2010). I also did not discuss ditransitive constructions, although claims made in Hale and Keyser (2002) and Beavers and Koontz-Garboden (2012) (and mentioned in passing in Chapter 3) suggest that Manner and Result are relevant to their argument realization as well. Furthermore, while I linked Manner and Result to obligatory argument realization and connected this claim to the Argument-per-Subevent Condition of Rappaport Hovav and Levin (2001), it remains unexplained *why* this kind of condition should hold. Finally, work needs to be done to show

that the correlation between Manner and Result and argument realization holds in other languages as well, beyond the small set of examples shown in that chapter.

There are unanswered questions that arise from Chapter 4 as well. First, while I sketched a two-tiered theory of thematic roles based on Jackendoff (1990) and Reinhart (2002, 2010), I did not provide a fully worked-out theory of the division of labour between the two tiers, or of how the semantics of verbs and prepositions interact in IVPCs and other instances of PP complementation. To do so would require a fuller understanding of the semantics of prepositions, particularly non-spatial ones, than is currently available. Furthermore, while I performed a survey of several languages from multiple families in correlating the availability of non-idiom IVPCs with the Framing Typology, a more extensive and formal survey is required to establish the full extent of this correlation. Before doing so, systematic diagnostics are needed in order to classify languages as verb- or satellite-framed, and to determine whether or not the language has non-idiom IVPCs. Finally, while I have found a link between IVPCs and other kinds of complex predicate, I did not investigate certain kinds of complex predicate formation, such as (pseudo-)noun incorporation and serial verb constructions. However, the analysis in Chapter 4 suggests that these, too, will show correlations with IVPCs.

As with most major research projects, for every question I have answered, there are several more that have been raised. My hope is that this will be seen not as a shortcoming of the current project, but instead as an inspiration to continue the research and come to a fuller understanding of the semantic and conceptual properties of words and how they impact the syntax. In this way, we can gradually simplify and improve the adequacy of our theories of grammar, and come to a fuller understanding of how the human language faculty works and how it interacts with other aspects of our cognition.

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