

Verb Meaning and Combinatory Semantics: A Corpus-Based Study of Spanish Change of State Verbs

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To Laetitia



Figure 1: The poet Martha Rivera Garrido illustrated the combinatorial complexity of *romper* using the lyrics by Silvio Rodríguez: *No importa donde rompa mi estación, si cuando rompe está rompiendo lo imposible*. It doesn't matter if it all falls apart, if it shatters the impossible when it does.'

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There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle. I believe in the second.

(Albert Einstein)

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Abstract

Even though it is an intuitive and perhaps obvious idea that composition leads to non-trivial semantic interactions between words, and these interactions affect the contents of predication, there has still been little work done on how verbs restrict their arguments and how flexible these restrictions are. This dissertation thus starts out with the observation that verbs have very rich combinatorial paradigms and raises the question of what this wide combinatorial capacity of verbs means for the semantics of the verb and the process of composition. Distributed in three case studies, a rich data set of the Spanish change of state verbs *congelar* ‘freeze’, *romper* ‘break’ and *cortar* ‘cut’ is analysed and further discussed against the background of studies from theoretical linguistics. Tackling the question of the rich combinatorial paradigm of verbs leads to taking a position on the theoretical horizon of theories of predication as well as theories of lexicon, for which I turn to Modern Type Theories and an underspecified lexical meaning.

Resumen

Aunque es intuitiva y quizás obvia la idea de que la composición conduce a interacciones semánticas no triviales entre las palabras que afectan al contenido de una predicación, hay todavía pocos trabajos que analicen el modo como los verbos restringen sus argumentos y examinen si sus restricciones son muy amplias o más bien limitadas. Esta tesis parte de la observación de que los verbos tienen unos paradigmas combinatorios muy ricos, para plantear la pregunta acerca del papel que desempeña la combinatoria predicado-argumento tanto en el significado de los verbos como en el proceso de construcción del significado composicional. Se llevan a cabo tres estudios de caso correspondientes a otros tantos verbos de cambio de estado, *congelar*, *romper* y *cortar*, en los que se presenta una rica colección de datos que se discute a la luz del conocimiento que proporcionan los estudios de lingüística teórica. Abordar la cuestión del rico paradigma de combinatoria de los verbos conduce a tomar una posición en el horizonte de las teorías de la predicación, así como también en el de las teorías del léxico. La presente tesis se decanta en este sentido por la teoría de tipos moderna (Modern Type Theory) y un significado léxico subespecificado.

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Chapter 1

INTRODUCTION

What belongs to the meaning of a verb has long been a controversial issue in linguistic theory. Certainly, the meaning of a verb determines the range of situations in the world that it can be used to describe. Much of the linguistic literature on verb meaning has thus focused on analysing verb uses when they describe events in the physical world. Consequently, the verb's combinatorial capacity has been restricted by default to physical entities. As a matter of fact, however, any randomly chosen text that is representative of a language, for instance a press article, illustrates that the range of combinatorial contexts of a verb vastly surpasses the domain of physical entities. A glance at a monolingual dictionary also illustrates that verbs appear so frequently in the company of a whole range of distinct kinds of arguments that dictionaries have to address this fact if they want to provide a reliable picture of how verbs work. For example, the Oxford Dictionary of English lists the following examples to illustrate the use of *break*.

- (1) a. **Windows** in the street were broken by the blast.
- b. The new government broke **the pattern of growth**.
- c. **The machine** has broken, and they can't fix it until next week.
- d. **A legally binding contract** that can only be broken by mutual consent
- e. **The weather** broke, and thunder rumbled through a leaden sky.

What this selection of examples illustrates is that a change of state verb like *break* can combine equally well with physical objects like *windows*, as well as with a whole range of entities that have no physical manifestation, as with *the pattern of growth* or a *legally binding contract*.

This dissertation thus starts out with the basic observation that, against native speaker intuitions, including those of many linguists, verbs have very rich combinatorial paradigms.

Going one step further, it has long been acknowledged, but hardly further developed, that the choice of arguments can strongly affect the meaning of the verb. Marantz (1984, p. 25), for example, observed that ‘just about every simple transitive English verb expresses a wide range of predicates depending on the choice of the direct object.’ He illustrated this observation with the verb *throw* as in example (2), where *baseball-throwing* seems to trigger some other kind of predication than *boxing-match-throwing* or *party-throwing* do.

- (2)
- a. throw a baseball
 - b. throw support behind a candidate
 - c. throw a boxing match
 - d. throw a party
 - e. throw a fit

It is worth mentioning that the data in example (2) do not seem to represent frozen idiom chunks, since sentence internal modification is allowed in all cases. The possibility of inserting new elements between the verb and the object, as well as the variation of the direct object, suggest that these are cases of free composition. What the example put forward by Marantz (1984) thus shows very clearly is that the nature of the objects in transitive verbs has strong semantic effects on the verb.

More recently, researchers working with huge amounts of corpus data (Hanks and Jezek, 2008) have also underlined the importance of the semantics of the theme argument for the meaning of the verb. Among many other things, these researchers made a basic and yet much understudied observation, namely that word meanings are strongly context sensitive even with respect to their closest context, argument selection. Extending an observation by Asher (2011, p. viii), it can thus be said that when word meanings are combined, the meaning of the result can differ from what standard compositional semantics together with the word’s lexicographic definitions have led us to expect.

This apparent effect of the argument on the interpretation of the verb is directly related to a broader issue with the compositionality of examples like the one illustrated in (2). The question that arises is whether *throw* has a meaning along the lines of ‘move the arm and hand and release an object’. If that is the case, the verb can be argued to restrict its argument selection for physical entities only. Accordingly, composition with other kinds of arguments can be claimed to call for additional composition rules so as to accommodate the presupposition of a physical entity.

Yet another way of tackling the combinatorial variety of verbs, as also pointed out by Marantz (1984, p. 25), is to try to distinguish the ‘basic’ or ‘literal’ uses of verbs in (2) from their ‘metaphorical’ and ‘idiomatic’ uses. That is, in fact, what cognitive linguists from the tradition of Lakoff and Johnson (1980) have been do-

ing for the last thirty years. Such an approach principally distinguishes between uses like the one in (2-a) and the remaining combinations of *throw*. The problems that arise when taking this path, however, are two. It is a well known fact that no clear line divides the ‘literal’ from the ‘figurative’ uses. Most importantly, however, this distinction does not provide clear rules for the combinatory behaviour of verbs.

In the theoretical literature, this broad combinatorial capacity of verbs, with its effects on the semantics of a verb phrase, has found few answers. On the one hand, theoretical linguists have avoided this problem by either considering that lexical items enter the compositional process after disambiguation, as is the case for the Montague school linguists, or have mainly limited their data to the set of examples that apply to the physical world. On the other hand, many other approaches, fundamentally belonging to the Mel’čuk school, have classified this kind of data as non-compositional in nature (Alonso Ramos, 2011). The two approaches basically rely on two distinct ways of viewing the lexicon and the process of composition. While in the first case a sense enumerative lexicon guarantees a neat process of semantic composition, in the second case examples like the ones illustrated in (2) are mostly consigned to the unfortunately too broad and too uncertain terrain of ‘figurative speech’, ‘metaphors’, ‘idioms’ and ‘collocations’.

The challenge postulated by verb-object combinations, like the one illustrated in (2), thus lies in analysing what kind of combinatorial capacity a verb actually has, whether it naturally ranges beyond the domain of physical entities, and if so, if these combinations can be constrained by rules.

For the present investigation I focus on the combinatorial capacity of change of state verbs in Spanish. More concretely, I use a sample of three major members of the class of change of state verbs, namely *congelar* ‘freeze’, *romper* ‘break’ and *cortar* ‘cut’, for which I extensively tracked their argument selection preferences based on naturally occurring data available through corpora.

What corpus data generally illustrate is that theme arguments of change of state verbs easily range from physical objects (3) to distinct kinds of eventualities like processes (4) and states (5), as in the case of *romper* ‘break’.¹

(3) Juan rompió la ventana/ un juguete/ el papel/ la camisa.
 Juan broke the window/ a toy/ the paper/ the shirt
 ‘Juan broke the window/ the toy/ tore the paper/ the shirt.’

(4) La crisis inmobiliaria rompió el desarrollo económico de España.
 The crisis property.ADJ broke the development economic of Spain

¹Following the Leipzig glossing rules, I use the following glosses throughout this work: ADJ = adjective; COND = conditional; FUT = future; IMP = imperfective; PL = plural; REFL = reflexive; SBJV = subjunctive; SG = singular; 2 = second person; 3 = third person

‘The housing crisis interrupted the economic development of Spain.’
[*El País Corpus*]

- (5) El cortejo llegó hasta el cementerio y en ningún momento
The procession arrived until the cemetery and in no moment
se rompió el silencio.
REFL broke the silence.
‘The procession reached the cemetery and at no time was the silence broken.’ [*El País Corpus*]

In light of this rich empirical evidence on the verb’s combinatorial behaviour obtained from the corpus, the present study provides a detailed analysis of three aspects that are crucial for the description of verbs.

Firstly, this investigation analyses how the selection of distinct types of theme arguments is related to the possibilities of syntactic realisation of a particular verb. Argument realisation possibilities are an important aspect in the description of verbs, since they have been crucially associated with the semantics of verbs. What corpus data show, in this respect, is that *congelar* ‘freeze’, *romper* ‘break’ and *cortar* ‘cut’ can appear in distinct syntactic patterns depending on the semantics of the theme they combine with.

Secondly, the present study explores the relation between the type of argument selected and the aspectual properties of the verb phrase. Concretely, I illustrate in more detail how distinct theme arguments have different effects on the gradability and durativity of the verb phrases.

Thirdly, addressing the non-trivial semantic interactions between verbs and their arguments leads to taking a position on the theoretical horizon that stretches from theories that resolve this problem in the lexicon itself, as the Sense Enumeration Lexicon, to theories that favour resolving this question in the compositional process by resorting to a rich system of types. The focus taken in this work does not reduce to a discussion about the phenomenon of polysemy and how it is manifested in the lexicon; rather I treat these data as a problem of composition and resort to Modern Type Theories for a theoretical proposal.

Uniting the richness of empirical data obtained from the corpus with the current theoretical understanding, as is done in this investigation, has allowed me to collect important insights on both, which I represent in detailed case studies of the three verbs under analysis. What is crucially illustrated is that the behaviour of these verbs challenges the current theoretical knowledge about argument realisation possibilities, aspectual characterisation, as well as the compositional system itself.

Below, I provide a short overview of the content of the chapters to come and how they relate to the general idea underlying this investigation.

Chapter 2 prepares the background against which I situate the problem of combinatorial variation of verbs. It addresses the conceptual bias of lexis and compositional systems and prepares the theoretical pathway on Modern Type Theories on which I elaborate my proposal to handle the verbal combinatorial regularities. In this chapter I basically argue that in order to be able to account for the richness of the combinatorial capacity of verbs we need to resort to fine-grained types that are able to capture the changes in the semantics of the arguments.

Chapter 3 reviews the literature on the class of change of state verbs in three respects. It outlines what previous literature has contributed regarding argument alternation possibilities that characterise the group of change of state verbs. It reviews what kinds of events change of state verbs are usually associated with. Finally, it also introduces the aspectual analysis in terms of scalar semantics which I later employ in the case studies. As I review the literature, I provide some criticism that arises with the corpus data I have encountered.

Chapter 4 describes in detail the corpus pattern annotation methodology used for the annotation of combinatorial patterns of Spanish change of state verbs. It further provides details about the corpus employed for the research and justifies the choice of sample data that was analysed in detail.

Chapter 5, chapter 6 and **chapter 7** lay out case studies of the verbs *congelar*, *romper* and *cortar* respectively. In each case, I outline the typical combinatorial contexts the verbs appear in and describe the argument realisation possibilities, making explicit how these depend on the choice of the theme argument. With this detailed description in place, I provide a proposal in terms of dependent types that synthesises the combinatorial and argument alternation regularities. Within the case studies, I also elaborate on the aspectual characterisation of each of the verbs and how it is susceptible to change when the theme has a relevant mereological structure. All the factors analysed contribute to showing that transitive verbs interact non-trivially with their theme arguments. Thus the main argument made throughout the case studies is that what has essentially been considered meaning shifts of verbs can receive an analysis that helps to avoid postulating several homophonous lexical entries, if we allow for a stronger involvement of the semantics of the theme argument.

Finally, **Chapter 8** begins with a brief summary of the observations of the three case studies, then further elaborates on the broader implications of the research and finally points out new research directions that emerge from the present study.

Chapter 2

THEORIES OF PREDICATION AND MODELS OF THE LEXICON: A SHORT REVIEW

At least since Aristotle, lexicographic works have tended to enumerate definitions and present guidelines on how to distinguish one meaning of a word from another in sets of necessary and sufficient conditions, which has emphasised the idea that words have meanings in isolation (See Dowty (1979) for discussion).¹ Similarly, past theoretical work has handled the lexicon as a set of disambiguated items. In Generative Grammar, it is arguably assumed that lexical items are inserted in syntactic structure or semantic operations after disambiguation. Similarly, formal semantics, concerned with composition, has also treated the lexicon in a very simplified way. Meaning shifts and alternations, however, are pervasive in natural language and they often arise precisely in the process of composition. These meaning shifts crucially represent a challenge for all theories of composition and the lexicon. Tackling the problem of meaning shifts and providing a possible analysis thus necessarily means situating the problem within the theoretical panorama of the possible ways of viewing the lexicon and choosing a particular approach to composition.

In this chapter, I illustrate that looking at the behaviour of verbs in a corpus shows that the standard compositional model has no satisfactory means of explaining why the same verb appears in a great variety of contexts except by postulating distinct senses. I present a short overview of the models of the lexicon and the compositional system and address the question of how a more sophisticated system of types could help deal with one of the crucial issues in composition and

¹In fact, theoretical lexicography has criticised the practice of meaning isolation, arguing that it represents a very simplistic view of the lexicon (Kilgarriff, 1997; Hanks, 2000). Nevertheless, lexicographical praxis maintains the convention of representing lexical meaning as atomic senses.

lexical semantics, namely variety in argument selection of verbs. This leads me to defend an underspecified model of the lexicon as well as a compositional process that involves an enriched type system.

2.1 Compositional semantics and the sense enumeration lexicon

Semantic theory in the Fregean tradition is based on two axioms. First, it assumes that the meaning of a sentence is determined by the meaning of its parts and their syntactic combination in the sentence. This assumption suggests that word meaning is not modulated in context and that the parts inserted into a particular syntactic configuration are not affected by the combination they are being incorporated into. Second, the truth conditions of the sentence determine the meaning of a sentence.

Montague Grammar (Montague, 1974) is an example of a theory that makes use of these two axioms. Under the assumption that the result of a predication is a function of the meaning of its parts and their mode of syntactic combination, a predicate represents a function that applies to an argument. Montague Grammar foresees two basic types, a type e for all entities and a type t for truth values. Any other available type results from a combination of these according to the following rule: for all α and β that are types, $\langle \alpha, \beta \rangle$ is a type. Such complex types correspond to functions from things of type α to things of type β . Predicates are assigned such complex types. This theory thus adequately explains how predication can be represented with a simple logical form and how the computation proceeds. However, for the purpose of the present study, several issues arise due to the fact that this system of types is very coarse-grained.

First, the impoverished semantics for words typical of Montague Grammar does not prevent combinatorial mismatches. In the case of argument selection for verbs, for example, all kinds of discrepancies between the expected nature of the argument and the real nature of the argument are theoretically possible though not linguistically acceptable, as illustrated in the following example.

(1) #John broke his shirt.

Although example (1) can be syntactically construed, it is semantically anomalous. The possible generalisation one could draw from this contrast is that *break* generally requires a hard physical object in English and *shirt* is not of this kind. This information, however, is not accounted for by a general type e that represents all kinds of entities.

In other cases, such as in example (2), the predication with *break* only succeeds through an additional process of predication adjustment, where *Cuba* stands

for a group of people understood as the Cuban government while *contract* represents an agreed-on a state of affairs.

(2) Cuba broke the contract.

Most importantly, however, when considering data like those in examples (3) through (5), it turns out to be very hard to see how one single type of entity *e* with no further reference to lexical entailments should account for the fact that a transitive verb like Spanish *romper* ‘break’ can combine with expressions like *ventana* ‘window’, *juguete* ‘toy’, *papel* ‘paper’, *camisa* ‘shirt’, *desarrollo económico* ‘economic development’ and *silencio* ‘silence’ and make a different semantic contribution to the meaning that determines the truth conditions of each sentence.

(3) Juan rompió la ventana/ un juguete/ el papel/ la camisa.

Juan broke the window/ a toy/ the paper/ the shirt

‘Juan broke the window/ the toy/ tore the paper/ the shirt.’

(4) La crisis inmobiliaria rompió el desarrollo económico de España.

the crisis property.ADJ broke the development economic of Spain

‘The housing crisis interrupted the economic development of Spain.’

[*El País Corpus*]

(5) El cortejo llegó hasta el cementerio y en ningún momento

the procession arrived until the cemetery and in no moment

se rompió el silencio.

REFL broke the silence

‘The procession reached the cemetery and at no time was the silence broken.’

[*El País Corpus*]

The Montagovian system of types provides a poor account of the data just outlined. This is due to the fact that the Montagovian logical forms simply give no further information about entailments of the predication, as pointed out by Asher (2011, p. 25). That means that defining the truth conditions of a sentence simply will make it difficult not to miss many entailments connected to non-logical meanings of words in natural language. The combinatorial variety of verbs, as well as the selectional restrictions, thus very clearly show how important it is to enrich logical form to accurately account for the richness of the data.

Furthermore, the combinatorial diversity of verbs is accompanied by variation in the meaning of the verb phrase (henceforth VP). That is, the result of the function described by *break* changes according to the semantics of the argument that the function takes. In example (6), the predication involving *break* has different entailments depending on whether the direct object is a physical object, an electronic device or a state.

- (6) a. John broke the vase.
 b. John broke the radio.
 c. Johan broke the silence.

As a general rule, events occur in time while objects do not, which has as a consequence that one and the same verb, such as *congelar* ‘freeze’, can describe two apparently completely different events. In example (7), it describes the exposure to very low temperature which converts any liquid substance contained in a physical object into a solid. In contrast, *congelar* ‘freeze’, in example (8), describes the interruption of a process.

- (7) Juan congeló la hamburguesa.
 Juan froze the hamburger
 ‘Juan broke the hamburger’.
- (8) [...] la propuesta socialista de congelar la convocatoria de nuevas
 the suggestion Socialist of freezing the official call of new
 oposiciones
 examinations
 ‘the Socialist proposal of freezing the official call for new examinations
 for public sector jobs.’ [*El País Corpus*]

The resulting predication may be so different that using the same verb, for instance *break*, with distinct arguments neither allows for co-predication nor does it license ellipsis (See Asher, 2011, for detailed discussion on these tests), as illustrated in example (9). This clearly indicates that predicates are indeed sensitive to the semantics of their arguments.

- (9) a. #John broke the vase and the silence.
 b. #John broke the vase and Mary the silence.

In the words of Searle (1980, p. 228), this kind of data shows that ‘there is a kind of hidden indexicality even in such apparently non-indexical concepts’ as the one represented by change of state verbs.

Insights of this kind lead one to consider making more flexible the assumption that word meaning is completely fixed prior to semantic composition. One solution to address these facts is to use a much more fine-grained system of types than what can usually be represented in terms of one single type of entities *e* and the type of truth values *t*. Before further elaborating on these kinds of systems, however, I want to briefly discuss how the problem just sketched has been addressed in several alternative systems.

As mentioned above, within Montague Grammar words enter the composition process after disambiguation. Consequently, the same verb with distinct selec-

tional restrictions is analysed as different homophonous words. The Montogian system of composition is thus based on a monomorphic model of the lexicon, namely the Sense Enumeration Lexicon (henceforth SEL). According to this model, all possible meanings of a lexical item are listed as part of the lexical entry. Words thus have to be disambiguated before entering composition. In the case of the verb *romper*, as illustrated in the above examples, the proposal could be to postulate distinct lexical entries with differing combinatorial restrictions, such that we could imagine a *romper*₁ that selects for physical objects and means ‘physical destruction’, as in example (3), a *romper*₂ that selects for processes, as in (4), and means ‘interrupt’, and a *romper*₃ that selects for states, as in (5), and conveys the meaning ‘stop existing’. That is, variation in complement selection in that kind of model amounts to distinct senses and the only way to establish a relation between verb senses is by meaning postulates. Formally, an SEL can be defined as follows (Pustejovsky, 1995, p. 34):

A lexicon L is a *Sense Enumeration Lexicon* if and only if for every word w in L , having multiple senses s_1, \dots, s_n associated with that word, then the lexical entries expressing these senses are stored as $\{w_{s_1}, \dots, w_{s_n}\}$.

Within an SEL two ways of storing lexical entries are conceivable. When the senses are contrastive, such as in the case of *bank* as an institution and *bank* as a piece of furniture, the senses are stored independently. When, however, there is a direct relation between the senses, such as in the case of *lamb* as a count noun or *lamb* as a mass noun, the senses are often understood to be stored as complementary senses: $w\{s_1, \dots, s_n\}$. It is worth mentioning that this classification is not without problems.

On such a view combinations like the one illustrated for *romper* have often been considered to be accidentally polysemous. Particularly from the perspective of the definition of regular versus irregular polysemy by Apresjan (1973, p. 15), they have often been classified as irregular and idiosyncratic.

Polysemy of a word A with the meaning a_i and a_j is called regular if in the given language, there exists at least one other word B with the meaning b_i and b_j , which are semantically distinguished from each other in exactly the same way as a_i and a_j and, if a_i and b_i , and a_j and b_j are non-synonymous.

In other words, regular polysemy is considered to represent a concrete relation among distinct senses of a word, which above all is found repeatedly in the lexicon of a language. A typical example of such a relation among word senses is metonymy, where the part-whole relation represents a rule that explains the distinct combinatorial behaviour of the verb *drink* in example (10).

- (10) a. John usually drinks a glass in the evening.
b. John usually drinks a beer in the evening.

As a matter of fact, a large number of studies that have provided evidence for regularities in the way words vary in their meaning have focused on what has been called *logical polysemy*, such as the kind of content-container metonymy in (10) (Apresjan, 1973; Nunberg, 1995; Pustejovsky, 1995; Copestake and Briscoe, 1995). The combinatorial possibilities displayed by *romper* ‘break’ or *congelar* ‘freeze’, however, are not covered under such a definition of regular polysemy. This is due to the fact that there is no direct metonymic relation between an action *romper* that has as a result a lack of integrity in a physical object and an action *romper* which interrupts a process, for instance. And yet, corpus data show that *romper* regularly combines with physical objects as well as with events. In other words, this combinatorial alternation pattern is actually systematic, a regularity that remains unexplained when the underlying assumption is that we only deal with distinct disambiguated words *romper*. Nevertheless, assuming an SEL allows us to keep the composition process simple, with lexical entailments of predicates simply amounting to stating that a verb like, for example, *romper* ‘break’ denotes the event of breaking.

Yet another interesting regularity that the SEL does not account for is the fact that one and the same verb can display distinct syntactic behaviour in relation to the theme argument it combines with, as illustrated in the contrast of (11-b) and (12-b).

- (11) a. John broke the table.
b. The table broke.
- (12) a. John broke the promise.
b. #The promise broke.

The conservative solution has been that each grammatical use of a verb should be registered in a separate lexical entry (Dowty, 1985). According to this view, the relation between the uses of a verb is captured via meaning postulates and meaning postulates are still the predominant model in the linguistic and philosophical literature to date (Dowty, 1979; Levin, 1993; Fodor and Lepore, 1998; Alonso Ramos, 2011). Yet this theoretic position fails to capture any deep semantic relation among the distinct patterns. It does not explain certain regularities, such as the observation that *romper* regularly appears in the anticausative form when it combines with physical objects, while it disallows this form for certain abstract theme arguments. These and other facts indicate that it is not the meaning of the verb that changes, as a sense enumeration model suggests, but rather the meaning of the verb phrase. What the SEL model thus misses is any relation between the

distinct patterns of behaviour of a verb. This then evokes the impression that a language like English requires several disambiguated verbs *break*, which, in turn, leads to a very simplistic model of the lexicon. That is, the Montague type system, together with the SEL model, simply has no way of implicating in the composition process any kind of semantic information provided by the complement.

Summing up so far, despite the fact that a semantic theory based on an SEL, the type of lexicon Montague Grammar is committed to, is a perfectly licit model of the lexicon which has allowed for an independent analysis of syntax and semantic interpretation, it represents a very poor model of lexical description. Each lexical item is understood to have unique selective behaviour and a particular syntactic environment. Nevertheless, considering the lexicon a pure plug-in module basically gives the impression that there is not much to say about word meaning, while analysing the fact that the same verb can appear in very different combinatory contexts as a matter of correctly matching the functor and the argument from a list of lexical entries represents a very simplistic view of the meaning of words and their interaction in composition. It is for this reason that the SEL model has received justified criticism and has been argued to be inadequate for the description of natural language semantics, of which I only want to point to two arguments.

For instance, Pustejovsky (1995) and Asher (2011) have pointed out that since words seem to take on different meanings in novel contexts, it is not always obvious how to select the correct word sense out of a list. These authors have further emphasised that the pervasive creativity of language makes it almost impossible for an enumeration of senses to provide an exhaustive list that correctly predicts the meanings in any new contexts.

Furthermore, it has been argued that an SEL greatly exaggerates the discreteness of fixed word senses. This understanding of meaning as atomic units has been argued to completely miss the fact that meanings overlap in diverse ways. The fact that the number of meanings for *romper* varies between 20 and 30 senses precisely illustrates the difficulty of distinguishing discrete word senses. In addition, the fact that there is indeed a lot of overlapping in the core semantic component shows that *romper* does not seem to be 20 to 30 ways ambiguous. All these facts render an SEL a poor model for natural language. Along the same lines Asher (2011) has argued most prominently that basing a semantic theory on an SEL amounts to saying almost nothing about how meanings combine in the process of predication.

In order to move away from the need for multiple listings of words, I analyse yet another theoretical approach that forces a certain amount of enrichment of the semantic content of lexical units and complicates the composition process. Specifically, I discuss the underspecification model of the lexicon as a model that allows for context sensitivity of predicates.

2.2 Underspecification

Underspecification is a formal device for handling ambiguities in lexical semantics. In this model, lexical representations are not fully specified until they enter the process of composition. Rather, lexical meaning is treated more like a potential that only fully fleshes out in composition. In contrast to the SEL, underspecification allows us to account for the complexity of lexical meaning and its variability in context.

One of the very early models that tries to account for contextual meaning variation of the lexicon was developed by Bosch (1985). The most prominent theory, and by far the most developed one, to account for meaning modulations from the early nineties on, has been the Generative Lexicon (henceforth GL) by Pustejovsky (1995).

More concretely, the GL represents a model that tries to capture the way words acquire distinct meanings in context. The proposal put forward by Pustejovsky (1995) suggests that words possess complex and structured meanings and that composition includes distinct generative mechanisms. According to Pustejovsky, specific lexical meanings can be generated in composition by the interactions of certain type constraints and some underspecified meaning that accounts for all the uses of a word. By enriching the process of composition and taking into account the semantic meaning of functor as well as non-functor elements, Pustejovsky (1995) aims at effectively tracking how complex meaning emerges in the process of composition. As pointed out by Asher (2011, p. 71), the compositional burden in this system lies in finding out how the underspecified sense is specified in an appropriate context and by means of which procedure.

In the GL, structured lexical entries display the potential a particular word has when entering into composition. One of Pustejovsky's proposals that applies for the cases under discussion (Pustejovsky, 1995, p. 45) is to employ considerably more fine-grained distinctions in the semantic content of verbs and their arguments than is usually assumed in the process of composition. Thus the Generative Lexicon theory, as its name implies, focuses on the generative aspects of the lexicon. Concretely, Pustejovsky (1995, p. 58) suggests four levels of representation to explain the generative potential of lexical units. These include:

1. Argument structure: specifies arguments and how they are realised syntactically
2. Event structure: defines the type of event, such as STATE, PROCESS or TRANSITION and includes subevent structure
3. Qualia structure: explains the qualia an entity is composed of, FORMAL, CONSTITUTIVE, TELIC, and AGENTIVE quale

4. Lexical inheritance structure: relates a particular lexical structure in the type lattice

The four levels of representation are encoded in a typed feature structure that makes specific lexical attributes available. The typed feature structure represents the logical form of a lexical entry, as illustrated in the lexical representation of *bake* in Figure 2.1:

$$\left[\begin{array}{l} \mathbf{bake} \\ \text{EVENTSTR} = \left[\begin{array}{l} E_1 = e_1:\mathbf{process} \\ \text{HEAD} = e_1 \end{array} \right] \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = \boxed{1} \left[\begin{array}{l} \mathbf{animate_ind} \\ \text{FORMAL} = \mathbf{physobj} \end{array} \right] \\ \text{ARG2} = \boxed{2} \left[\begin{array}{l} \mathbf{mass} \\ \text{FORMAL} = \mathbf{physobj} \end{array} \right] \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \mathbf{state_change_lcp} \\ \text{AGENTIVE} = \mathbf{bake_act}(e_1, \boxed{1}, \boxed{2}) \end{array} \right] \end{array} \right]$$

Figure 2.1: GL representation of *bake*; pag. 123

The qualia structure in particular is what provides the generative potential of words that allows speakers to be creative. It provides explicit information about objects and eventualities that are usually associated with the denotation of a particular object. Concretely, the qualia structure specifies four aspects of the meaning of lexical items. There is the FORMAL quale that distinguishes the object from other objects. There is the CONSTITUTIVE quale, which specifies the object's constitutive parts. There is the TELIC quale, which describes the purpose or function of the entity described by the word. And finally there is the AGENTIVE quale, which describes the event that brings about the existence of the object, as illustrated in the lexical entry for *cake* in figure 2.2:

$$\left[\begin{array}{l} \mathbf{cake} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = \mathbf{x:food_ind} \\ \text{D-ARG1} = \mathbf{y:mass} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \text{CONST} = \mathbf{y} \\ \text{FORMAL} = \mathbf{x} \\ \text{TELIC} = \mathbf{eat}(e_2, z, x) \\ \text{AGENTIVE} = \mathbf{bake_act}(e_1, w, y) \end{array} \right] \end{array} \right]$$

Figure 2.2: GL representation of *cake*; pag. 123

In addition to the typed feature structure for lexical entries, Pustejovsky (1995, p. 61) proposes three generative rules for combining meanings, namely type coercion, selective binding and co-composition, which he describes as follows:

1. COERCION: semantic operation that converts an argument to the type which is expected by a function, where it would otherwise result in a type mismatch.
2. SELECTIVE BINDING: where a lexical item or phrase operates specifically on the substructure of a phrase, without changing the overall type in the composition.
3. CO-COMPOSITION: where multiple elements within a phrase behave as functors, generating new non-lexicalized senses for the words in composition

To provide an example of how the GL copes with meaning shifts in predication, I turn to the English verb *bake* in composition with distinct kinds of themes. As earlier observed by Atkins et al. (1988), *bake* seems to be ambiguous between a ‘change of state’ and a ‘creation’ reading. This seems to correlate with the theme argument of *bake*, as illustrated in the following examples taken from Pustejovsky (1995, p. 122).

- (13) a. John baked the cake.
 b. John baked the potato.

The GL representation for *cake* has an agentive quale. Consequently, the creation meaning of *bake a cake* results from the operation of combining of the agentive quale of the noun with the verb understood as a bake-action. This operation represents a more complex process than function application, namely co-composition. *Bake* obviously applies to its complement, yet the argument is necessary to co-specify the meaning of the verb phrase. Thus, according to this system, when we unify the typed feature structure of *bake* with that of *cake*, the qualia structures compose and derive the sense of the VP by matching the AGENTIVE quale of the verb and the argument. The FORMAL quale of the complement determines the FORMAL role of the verb phrase (Pustejovsky, 1995, p. 124). The unification of typed feature structures returns a new typed feature structure where the values in the common arguments of the two typed feature structures are replaced with what represents the greatest lower bounds in the type hierarchy. Then all the argument values are added which are not shared. The final typed feature structure with the creation-reading is illustrated in Figure 2.3.

Potato, in turn, being a natural entity, lacks the AGENTIVE quale that is characteristic of artefacts. As a consequence, combining *bake* with *potato* does not derive a creation sense, but rather a pure change of state meaning. In this way, both uses of *bake* can be derived by involving the semantics of the noun phrase in the composition process. This, in turn, allows the GL to treat *bake* as logically

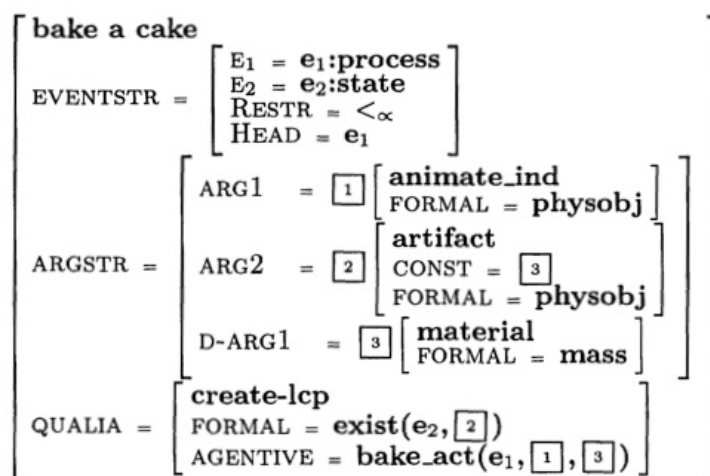


Figure 2.3: GL representation of *bake a cake*; pag. 125

polysemous, since it allows for deriving both senses by virtue of putting some of the compositional effort on the argument.

Exploiting qualia by focusing on a particular component of the lexical meaning of a noun and unifying this with the typing requirement of a predicate of the noun phrase or a higher projection can account satisfactorily for many coercion and copredication phenomena. Generating meaning in the GL thus amounts to selecting for distinct components. In addition, generative mechanisms may change the type of expressions and their denotation, while function application can access these operations, making the function effectively polymorphic. Treating composition in this way translates into dividing the semantic load more evenly between the elements in composition. What this system achieves is using a reduced set of words with greater internal structure than usually assumed and generating a large set of word senses in composition. This is how the GL not only explains many meaning variations in predications as regular, but also greatly reduces the size of the lexicon, compared to an SEL. A major consequence of such an approach is that words are not interpretable outside their syntactic and semantic context, which puts all the weight on the system of selecting meaning components of lexically specified meanings.

Several points emerged in the course of examining the framework for the purpose of the current study; I briefly mention them here. From the kind of data usually studied by the GL, it becomes obvious that this model was particularly motivated by solving coercion phenomena as well as the logical polysemy related to distinct semantic facets of a noun. Thus, when looking at verbs, Pustejovsky (1995) is principally concerned with accounting for coercing predicates. Therefore, his analysis focuses on the fact that predicates like *enjoy* or *begin*, which take

eventualities as their internal arguments, can also combine with physical objects, as in the following example.

(14) John began a book.

That is, the kind of verb behaviour the GL usually accounts for is that a verb like *begin* cannot directly select for an argument like *book*, and thus an additional operation like coercion is required. This explanation of the coercion process has led Pustejovsky (1995) to focus particularly on the semantics of nominals and on how they are accommodated as events. The data observed for this thesis, however, basically represent another phenomenon, namely that verbs that normally combine with physical objects also easily combine with events, which regularly produces what has often been called ‘figurative meanings’. Consequently, the present data fall out of the range of the phenomena described by the Generative Lexicon.

The GL has also been criticised for a range of other theoretical considerations (Asher, 2011), of which I only want to point out the ones relevant here. It has been observed that the qualia values seem to be too rigidly specified and therefore fail to account for certain kinds of data. For instance, sometimes nouns simply have no clearly associated eventualities, as the GL wishes to stipulate, or the eventuality associated with an entity depends on contextual factors (Verspoor, 1996). To give an example, it is not clear whether the TELIC quale of an artefact always has to be the same. Thus, example (14), for which Pustejovsky assumes that the reading always amounts to ‘enjoy reading the book’ based on the fact that the TELIC quale of *book* has the value *read* (e,w,x,y)², which unites the aspect of being a physical object with the aspect of containing information, as illustrated in Figure 2.4.

$$(29) \quad \left[\begin{array}{l} \mathbf{book} \\ \text{ARGSTR} = \left[\begin{array}{l} \text{ARG1} = \mathbf{x:info} \\ \text{ARG2} = \mathbf{y:physobj} \end{array} \right] \\ \text{QUALIA} = \left[\begin{array}{l} \mathbf{info\textcdot} \mathbf{physobj_lcp} \\ \text{FORMAL} = \mathbf{hold(y,x)} \\ \text{TELIC} = \mathbf{read(e,w,x,y)} \\ \text{AGENT} = \mathbf{write(e',v,x,y)} \end{array} \right] \end{array} \right]$$

Figure 2.4: GL representation of *book*; pag. 116

As a matter of fact, however, it is perfectly plausible to think of an example

²The notation (x,y) means that *book* picks out a dot object, in this case either a book as a physical object or as the information contained in the physical object. See Pustejovsky (1995) for further discussion.

like *The goat enjoyed the book*. interpreted as a goat eating the book, as noted by Asher (2011, p. 19). In this case, the TELIC quale would still unite the aspect of physical object and information content and yet not describe an event of ‘enjoy reading the book’. That means that the TELIC quale in the qualia structure needs to be open to revision in each case. Even more, it has to be able to take into account the qualia of the subject to the predicate. Consequently, qualia values need to be more flexible. This necessary flexibility, however, goes directly against the fundamental idea of the GL, according to which lexically available meaning components are selected during the composition process. This kind of data causes the notion of selectional meaning composition to collapse, as pointed out by Asher (2011, p. 74). Nevertheless, with respect to the current study, GL contributes the crucial insight that there is a pressing need for a stronger involvement of the arguments of a verb when determining the meaning of a particular VP.

Yet another way of providing an analysis for the observed data is to take meaning fluctuation in context as evidence for contextualism. Contextualists e.g. Recanati (2005) maintain that the content of the sentence is not fixed only by linguistic rules and lexical content, but also by the context. They argue for the consideration of pragmatic rules in the determination of truth conditions, which constitute a set of maps from one lexical meaning to another. Specifically, the contextualist approach argues that there are many pragmatically controlled processes which are not triggered solely by the linguistic sign, but rather by the context. For example, the process of transfer, as illustrated in example (15), taken from Nunberg (1995, p. 115), is typically considered as pragmatic. It is argued that the reference of ‘ham sandwich’ is only understood in the context of a bar where the waiter refers to a client in terms of the food the client ordered.

(15) The ham sandwich is at table 7.

In general, a crucial process argued for by the contextualists is free enrichment, which, as its name says, allows the hearer to freely enrich the literal content of an utterance. Though triggered by a linguistic expression, free enrichment takes place to make the interpretation of an utterance more specific than its literal interpretation. It is considered a top-down, pragmatically controlled process that affects the truth conditions of utterances. The contextualist approach goes as far as to claim that content is only expressed in the context of a determinate speech act and thus fundamentally denies that the interpretation of propositions in a bottom up way makes any sense without contextual modulation. Semantic content is thus assigned to simple expressions in context (Recanati, 2005, p. 178). In the face of examples like the one below provided by Searle (1980, p. 222-3), the contextualist view would defend that enrichment is necessary to determine the utterance’s truth conditions concerning cutting.

[...] and though the word [cut] is not ambiguous, it determines different sets of truth conditions for the different sentences. The sort of thing that constitutes cutting the grass is quite different from, e.g., the sort of thing that constitutes cutting a cake. One way to see this is to imagine what constitutes obeying the order to cut something. If someone tells me to cut the grass and I rush out and stab it with a knife, or if I am ordered to cut the cake and I run over it with a lawnmower, in each case I will have failed to obey the order. That is not what the speaker meant by his literal and serious utterance of the sentence.

Contrary to the radical contextualist view, other researchers (Marantz, 1984; Pustejovsky, 1995; Hanks and Jezek, 2008; Asher, 2011) acknowledge the importance of the arguments of the verb while still defending a basic lexical meaning. What Searle (1980) basically argues for is that in order to determine the exact way of cutting we need to know what is being cut. This is the way we can figure out what it means for grass to be cut in contrast to what it is for a cake to be cut.

On closer consideration, the semantics of the possible theme arguments of the Spanish equivalent of ‘cut’ *cortar*, as in (16) through (18), only confirm that the semantic shifts of distinct *cortar* verb phrases are very fine and truly depend on the semantic properties of the theme.

- (16) a quien pillan robando le cortan la mano.
to whom catch robbing him cut the hand
‘Whoever they catch stealing, they cut off his hand.’
[*El País Corpus*]
- (17) Francia cortarí­a la entrega de etarras.
France cut.COND the delivery of ETA members
‘France would stop the delivery of ETA members.’
[*El País Corpus*]
- (18) La convocatoria electoral cortó el proceso parlamentario.
the call electoral cut the process parliamentary
‘The call for elections interrupted parliamentary processes.’
[*El País Corpus*]

In this study, I join the argument of Searle (1980) and argue that in order to determine the VP meaning, it is not enough to appeal to world knowledge, as suggested by the contextualists, but we need to attend to the verb meaning together with the semantics of the argument. The variety of predicates displayed in (16) through (18) is attributed to the variety of the input arguments.

As for the compositional system, addressing this problem amounts to elaborating on the system of types and the composition rules so as to take into account

the semantic contents of both of the constituent expressions, namely the verb and its theme. Consequently, a richer notion of composition and lexical structure is necessary to explain systematic variation in the combinatorial behaviour of verbs and the variation in meaning that comes along with it. As I will explore in more detail in the following section, a quite natural response has become the use of richer type theories inspired in the work of Martin-Löf (1984), where the intuitive and the formal meaning of the word conflate more clearly.

2.3 Theories based on enriched types

In recent years, different yet related approaches have incorporated a richer notion of lexical semantics within compositional semantics (Luo, 2011b; Asher, 2011; Asher and Pustejovsky, 2013; Chatzikyriakidis and Luo, 2013). Several of these approaches make use of an enriched type theory to compose meanings. Here I briefly introduce one of those approaches (Chatzikyriakidis and Luo, 2013), which serves to provide a proposal as an answer to the observation made so far that different types of themes influence the meaning of the verb phrase differently. Given the focus of the present investigation that is mainly interested in analysis, below I only provide a brief summary of the main concepts present in the theories based on enriched types, skipping many technicalities.

As mentioned above, in Montague semantics, the system of types was defined as follows:

- (19) a. e is a type
 b. t is a type
 c. for all α, β that are types, $\langle \alpha, \beta \rangle$ is a type

As argued above, this simple type system is not capable of ruling out any anomalies, as in (1). Even more importantly, however, the simple type system has no transparent means to account for the fact that with different types of themes, the VP can impose different kinds of conditions on its subject, as illustrated in the following examples.

- (20) Juan/ el hacha/ el huracán/ el peso de los libros/ la explosión
 Juan/ the axe/ the hurricane/ the weight of the books/ the explosion
 rompió la mesa.
 broke the table
 ‘Juan/ the axe/ the hurricane/ the weight of the books/ the explosion broke
 the table.’
- (21) Juan/ #la rueda/ #el accidente/ #la anchura de la piscina/ #la
 Juan/ the wheel/ the accident/ the width of the swimming pool/ the

explosión rompió la ley/ la norma.
explosion broke the law/ the norm
'Juan/ the wheel/ the accident/ the width of the swimming pool/ the explosion broke the law/ the norm.'

As will be discussed in more detail in the case study of *romper* in chapter 6, what emerges from the contrast between (20) and (21) is that the semantics of the themes that *romper* combines with has a strong influence on the possible subjects.

The type system presented in example (19) does not offer a transparent account of how the semantics of an argument can influence the semantics of the resulting predication. If, however, predicates are sensitive to the semantics of their arguments and meaning adjustments appear with predication, then this is an argument for the need for a much richer system of types to guide predication. To explain the difference in meaning and syntactic alternations, it is necessary to resort to much more fine-grained types assuming a finite set of different individuals, e.g., human, physical-object, etc. This has led researchers to the hypothesis that a great many more types than first envisaged by Montague Grammar are necessary to theoretically account for the real compositional capacity of predicates and to rule out anomalies. With a richer system of types, it is possible to restrict the domain of application of predicates more precisely. In this respect, more recent logics have developed techniques for allowing the type of an argument to, in a sense, influence the type of the interpretation of the predicate it combines with. Here I follow Luo (2011a) in calling these rich type systems Modern Type Theories (hereafter, MTT).³

MTTs (Martin-Löf, 1984; Ranta, 1994; Chatzikyriakidis and Luo, 2013), known particularly from computer science, allow fine-grained distinctions to be made within a given semantic type. In these theories, propositions are conceived of as types, (the types of their proof), not as sets of worlds. Sentences are thus interpreted as propositions of type *Prop*. MTTs are many-sorted in the sense that individual verbs and common nouns are each assigned distinct types (e.g. $\llbracket \text{man} \rrbracket$ and $\llbracket \text{woman} \rrbracket$ are distinct types),⁴ rather than all belonging, for example, to the type $\langle e, t \rangle$. That is, common nouns are interpreted as types.⁵ For example, the noun *man* is not interpreted as a set of entities, but rather as a type $\llbracket \text{man} \rrbracket$. Moreover, these types can stand in subtype relations to each other. For example, $\llbracket \text{man} \rrbracket$ can be defined as a subtype of $\llbracket \text{human} \rrbracket$. The granularity of the many-sorted type

³It is worth pointing out that this system is impredicative, which means it is not strongly typed. Future studies should thus determine whether a possible reformulation of the typing proposal I provide might be necessary.

⁴In these theories, the denotation brackets ($\llbracket \ \rrbracket$) indicate types rather than objects in a model theory.

⁵For a detailed discussion on common nouns as types see Luo (2011a).

systems depends on each theory, ranging from one type per lexical item on the one hand to complex type hierarchies on the other.

Importantly, each predicate places type presuppositions on its arguments, which makes the predication much more restricted than in the normal Montagovian setting and allows non-consistent semantic type applications to be ruled out without assuming any meaning postulate. Verbs, for example, are not interpreted over one single domain of entities, as in the Montagovian system, but rather can be functions over any variety of domains. Thus a verb can be represented as a predicate of type $A \rightarrow \text{Prop}$, A being the domain of objects that the verb can meaningfully apply to (Luo, 2011a). Defining a domain of application for a predicate represents a way of making explicit the selectional restrictions that predicates impose on their arguments. Such a semantics lives in the tradition of Montague Grammar, but it allows for powerful type structures to serve as a mechanism for including more semantic features than the Montagovian system could handle (Asher, 2011).

MTTs further allow the argument of a functor to specify several distinct aspects of its content by the use of the crucial notion of dependent type. Dependent types are types whose values depend on supplying a value from another type, namely the value of its argument or the type of its argument. The latter case, known as a dependent Π -type, is what I will be interested in for my analysis. A dependent Π -type corresponds to a family of functions of the form $A_1 \rightarrow B$, $A_2 \rightarrow B$, $A_3 \rightarrow B$, etc., where all A_n are subtypes of the same supertype A . This is written $\Pi A_n: A.A_n \rightarrow B$. This is the way the dependence of the meaning of the verb on the meaning of its argument can be encoded.

To give an example, dependent Π -types are used by Chatzikyriakidis and Luo (2013) to interpret subsective adjectival modification. $\llbracket \text{Skilful} \rrbracket$, for instance, must apply to common nouns of type $\llbracket \text{human} \rrbracket$ or a subtype of it, e.g. $\llbracket \text{violinist} \rrbracket \prec \llbracket \text{human} \rrbracket$.⁶ The effect of the modification on e.g. $\llbracket \text{violinist} \rrbracket$, however, is not exactly the same as that on $\llbracket \text{human} \rrbracket$, and we cannot infer that if one is a skilful violinist, s/he is also a skilful person. To allow for the different effects of $\llbracket \text{skilful} \rrbracket$ on different types of arguments, it is treated as a family of functions, namely the functions that result from combining it with different subtypes of the type of entity. In this way we get distinct propositional functions:

- (22) a. $\llbracket \text{skilful} \rrbracket . \llbracket \text{human} \rrbracket \rightarrow \text{Prop}$
 b. $\llbracket \text{skilful} \rrbracket . \llbracket \text{violinist} \rrbracket \rightarrow \text{Prop}$

The resulting typings in (22) apply to a restricted domain of arguments. A in this case is the domain of human beings that $\llbracket \text{skilful} \rrbracket$ can meaningfully apply to. In this way selectional restrictions are naturally incorporated through the type system and types are used to guide logical form very strongly.

⁶Notation $A \prec B$ indicates that A is a subtype of B .

Resorting to a more sophisticated type system thus allows us to make use of many subtypes of the type of entities, such as physical objects, humans, eventualities, etc. As I will work out in more detail in the corresponding case study in chapter 6, Spanish *romper* restricts its themes to either a physical object, an atelic eventuality or a commitment-denoting noun. The differences in theme arguments accompany a difference in predication. What this means for the type of the verb is that *romper* can be assigned a type, which is *A*-indexed. Its type will thus depend on the type of the theme. Extending the notation of Chatzikyriakidis and Luo (2013), I suggest a dependent type in (23). This notation expresses that the dependent type ROMPER depends on three distinct types: PHYSICAL OBJECT, ATELIC EVENTUALITY and COMMITMENT.

- (23) a. ROMPER: $\Pi A:\text{entity}.B:\text{cause}.\text{ROMPER}(B,A)$, which corresponds to a family of functions:
 b. $x:\text{solid-phys-obj}.y:\text{cause}.\text{ROMPER}(y,x)$
 c. $x:\text{atelic-eventuality}.y:\text{cause}.\text{ROMPER}(y,x)$
 d. $x:\text{commitment}.y:\text{agent-cause}.\text{ROMPER}(y,x)$

The use of a sophisticated type theory for lexical items and the specification of how these items combine and interact in composition provide a way of constraining the lexical semantics to guarantee semantically well-formed predications and prevent ill-formed ones. A more detailed description of selection restrictions of *congelar*, *romper* and *cortar* and how those should figure into the type system in terms of dependent types will be provided in the respective case studies.

2.4 Chapter summary

In this chapter, I have provided a short discussion about the lexicon and compositional semantics. I have pointed out that in the tradition of theoretical semantic research the focus on constructing a simple logical form has led researchers to disregard further assumptions about lexical meaning, which is why multiple listings of words with separate meanings has been the most common model of the lexicon throughout the years. I have further provided data to illustrate that this understanding of the lexicon and the composition process is problematic and that several theories have responded to these problems in distinct ways.

With respect to the problem at hand, I have turned to MTTs as a plausible system that can provide a response to the challenge posed by the data outlined so far. In more detail, I have explained that verbs in type-theoretic semantics are understood as predicates over a variety of domains, rather than over one single domain as in Montague Grammar. This theoretical assumption constitutes the basis for a more complex function application in which functor types may provide

different value types, when they take arguments of different fine-grained types. Such a theoretical shift makes explicit how the internal semantics of words can be taken seriously in that the denotation of the argument does indeed affect the denotation of the functor. As expressed by Asher (2011), meaning modulation in predication is not a problem of meaning change in the lexicon but a problem of how lexically given meanings combine, that is, a true problem of composition.

Chapter 3

CHARACTERISTICS OF THE CHANGE OF STATE VERB CLASS

This thesis is based on the analysis of the set of change of state verbs (henceforth CoS), because they are interesting for at least three reasons. First, CoS verbs are very frequent in all kinds of texts and therefore constitute a representative class of data. Second, CoS verbs have been explored exhaustively with regard to their grammatical properties (Abusch, 1986; Levin and Rappaport Hovav, 1995; Rappaport Hovav and Levin, 2005; Koontz-Garboden, 2007; Kennedy and Levin, 2008; Koontz-Garboden, 2009; Levin and Rappaport Hovav, 2010), but little corpus exploration has been conducted to contrast whether the theoretical predictions systematically correlate with a representative sample of data (McKoon and Macfarland, 2000). Finally, CoS verbs display a wide variety of selectional possibilities, which represents a crucial factor for exploring and tracking the behaviour of verbs and their semantics. Thus, before proceeding to the characterisation of the three change of state verbs, which I provide in the respective case studies, I describe the CoS verb class in general, treating three characteristic aspects in detail. First, I consider the typical argument realisation possibilities that characterise the group of change of state verbs. Then I turn to the event structure of change of state verbs and discuss the event decomposition typical for change of state events. Finally, I turn to the aspectual properties of CoS phrases by associating changes of state with scalar change.

3.1 Argument realisation possibilities of change of state verbs

The change of state verb class is often characterised by the possibility to alternate between a causative form, as in example (1), and an anticausative form, as in example (2).

- (1) Juan rompió el vaso.
Juan broke the glass
'Juan broke the glass.'
- (2) El vaso se rompió.
the glass REFL broke
'The glass broke.'

In the intransitive variant, the semantic role of the subject is the same as the role of the object in the transitive use, that is to say a deep structure object. This alternation has received the name of causative-anticausative alternation, though other nomenclatures, such as causative-unaccusative or causative-inchoative alternation, can also be found in the literature (see for instance Brosseau and Ritter, 1991; Levin and Rappaport Hovav, 1995; Mendikoetxea, 1999; Chierchia, 2004; Alexiadou et al., 2006; Koontz-Garboden, 2009; Labelle and Doron, 2012; Piñón, 2001; Horvath and Siloni, 2011; Rappaport Hovav and Levin, 2012, and reference cited therein). For the purpose of this work, I am going to refer to this alternation as the causative-anticausative alternation and the causative and the anticausative form respectively.

The class of change of state verbs has been generally considered the core class of causative alternating verbs (Levin, 1993; Jespersen, 1927; Levin and Rappaport Hovav, 1995; Reinhart, 2006). Traditionally, two derivational accounts have been suggested concerning the relationship between the transitive and the intransitive variants, namely the causativisation approach (Lakoff, 1968; Dowty, 1979; Parsons, 1990; Rappaport Hovav and Levin, 2012) and the decausativisation approach (Levin and Rappaport Hovav, 1995; Reinhart, 2000).

On the one hand, the causative view considers causative verbs as basically monadic. Consequently, the causative form is derived from the anticausative through causativisation by addition of the causative operator CAUSE. Taking Spanish *romper* 'break' as a prototypically cited CoS verb and drawing on the Lexical Conceptual Structure by Rappaport Hovav and Levin (1998), the causativisation can be represented as in example (3). The a) example basically represents an intransitive, internally caused event *romper* while its b) counterpart represents an externally caused event with an additional causative operator CAUSE.

- (3) a. *romper*_{anticausative}: [y BECOME *roto*]
 b. *romper*_{causative}: [[x DO-SOMETHING] CAUSE [y BECOME *roto*]]

On the other hand, the decausativisation approach defends that alternating verbs are inherently dyadic, such that a verb like *romper* in both its transitive and intransitive uses has a bieventive Lexical Conceptual Structure, as illustrated in the following.

- (4) *romper*: [[x DO-SOMETHING] CAUSE [y BECOME *roto*]]

The decausativisation approach argues that in the intransitive variant the cause argument does not project into the syntax because it is bound in the mapping from the Lexical Conceptual Structure to the argument structure. Yet many languages have a morphological marker on the anticausatives, which suggests that they are derived from their causative counterparts, just as Spanish is marked by a reflexive clitic *se*, as in example (5).

- (5) El vaso se rompió.
 the glass REFL broke
 ‘The glass broke.’

Whichever the theoretical approach taken for the direction of the derivation, which might be subject to cross-linguistic variation, English *break*, as well as Spanish *romper*, are expected to be truly causative verbs that regularly appear in the causative-anticausative alternation, as the following examples illustrate.

- (6) a. Juan broke the glass.
 b. The glass broke.
- (7) a. Juan rompió el vaso.
 Juan broke the glass.
 ‘Juan broke the glass.’
 b. El vaso se rompió.
 the glass REFL broke
 ‘The glass broke.’

Such verbs have been claimed to be underspecified with respect to the thematic nature of the causing eventuality.¹ This underspecification in the causing eventuality, in turn, has been correlated with the possibility of omitting the causing argument, which regularly returns the anticausative variant.

¹See Van Voorst (1995) for an exhaustive literature review on the underspecified character of the causing eventuality of *breaking*.

On a closer examination of the data, however, several researchers, such as Dowty (1979, p. 207) or Levin and Rappaport Hovav (1995, p. 85), have acknowledged throughout the years that there are many exceptions to both claims, namely that causative-anticausative alternating verbs are cause underspecified, as well as to the observation that the causative-anticausative alternation is regular. To mention an example relevant to the data studied here, Spanish *romper* has a restricted range of possible causes for certain choices of the object argument. Thus example (8) illustrates that what qualifies as a cause of a *romper* event varies across the choice of direct objects.

- (8) Juan/ #la rueda/ #el accidente/ #la anchura de la piscina/ #la
 Juan/ the wheel/ the accident/ the width of the swimming pool/ the
 explosión rompió la ley/ la norma.
 explosion broke the law/ the norm
 ‘Juan/ the wheel/ the accident/ the width of the swimming pool/ the explosion broke the law/ the norm.’

Negative evidence on certain abstract objects as subjects of intransitive *romper* leads to the insight that, unlike physical objects, which can undergo breaking both as objects of transitives (7-a) and as subjects of intransitives (7-b), not all abstract themes can appear in the anticausative, as illustrated in example (9-b).

- (9) a. Rompió la promesa/ la norma/ la ley.
 broke.3.SG the promise/ the norm/ the law
 ‘He broke the promise/ the norm/ the law.’
 b. #La promesa/ la norma/ la ley se rompió por sí sola.
 the promise/ the norm/ the law REFL broke by self alone
 ‘The promise/ the norm/ the law broke by itself.’

It is worth emphasising at this point that, since the clitic *se* can be used to form reflexive passives in Spanish, the idiomatic anaphor *por sí solo/a* is used in (9-b) to deactivate the reflexive passive reading. Thus *por sí solo/a* contributes to construing *promesa*, *norma* and *ley* as the sole cause of the event, thus identifying the cause and the theme as one unique argument, as also observed for Italian anticausatives by Chierchia (2004).

Further elaboration and discussion of the attested corpus data will be provided in each of the case studies. What is important for now is that example (8) and example (9-b) show some irregularities that contradict what is usually assumed about CoS verbs. Example (8) illustrates that *romper*, as a prototypical member of the causative-anticausative alternating class of verbs is not cause-underspecified across the board, since certain *romper*-events cannot be caused by instruments or natural forces, but require agents. In addition, example (9-b) shows that certain

abstract theme arguments of *romper* do not allow for an anticausative form, a fact related to the choice of the theme argument.

In a recent study, Rappaport Hovav and Levin (2012) also observed certain object-subject interdependencies that influence the argument realisation possibilities of usually alternating change of state verbs. This fact has led the authors to argue for the intransitive variant as the basic one and thus argue that the subject is not lexically determined. This theoretical position allows Rappaport Hovav and Levin (2012) to postulate a non-lexical condition for the subject that represents the cause of the change. According to this condition, causatives must describe instances of direct causation of the event.² Such a condition is essentially fulfilled if there is no intermediate entity between the causer and the causee in a causal chain. This approach seems to allow for a unified analysis of a great variety of alternating and non-alternating verbs, which is precisely what derivational accounts were missing.

Nevertheless, it is not entirely clearly how the Direct Causation Condition restricts certain subjects appearing in correlation with certain object choices, as is the case in example (8). Most prominently, however, choosing the intransitive variant as the basic variant does not explain why certain uses of prototypically alternating causative-anticausative verbs preclude the alternation. To account for this fact, Rappaport Hovav and Levin (2012) postulate yet another condition called the Proper Containment Condition. According to this condition, change of state events that are properly contained within a causing act require the expression of the cause in the same clause. What this condition does is to preclude the use of the anticausative variant if the change of state is explicitly asserted to be brought about agentively. It is important not to confuse this Proper Containment Condition, which applies to naturally alternating change of state verbs, such as *romper*, with the obligatory expression of causing agents for strictly agentive verbs such as *asesinar* ‘assassinate’. In the case of *romper*, there are in fact necessarily causative uses which are nevertheless not caused by agents. Thus the contrast in example (10) illustrates that actions that restrict for humans, such as *autorización* ‘authorisation’, also preclude the anticausative.

- (10) a. La autorización de la ikurriña rompió un tabú que parecía
the authorization of the ikurriña broke a taboo that seemed
sagrado.
sacred
‘The authorization of the Basque flag broke a taboo that seemed

²A similar argument has been put forward by Brosseau and Ritter (1991) who distinguish between direct causation verbs (DO-verbs) and indirect causation verbs (CAUSE-verbs) and consider that DO-verbs lack the anticausative variant. Yet their observations contrast distinct breaking verbs in French, such as *brisé* and *cassé*, rather than distinct uses of the same verb.

- sacred.’ [*El País Corpus (adapted)*]
- b. #Un tabú que parecía sagrado se rompió por sí solo.
 a taboo that seemed sacred REFL broke by self alone
 #‘A taboo that seemed sacred broke by itself.’

Postulating such a condition represents one of the very first semantic accounts for the data fact that necessary external causation does not seem to be a property that comes along with the semantics of the verb, which would strictly contrast verbs like *break* and *assassinate*. Rather, necessarily external causation seems to be much more elusive. The interesting insight from the data outlined here is thus that Spanish *romper*, and similarly English *break*, are not fully accounted for, neither by the causativisation nor the decausativisation approach. Neither account can explain when and why supposedly alternating causative-anticausative verbs sometimes lack an anticausative counterpart and why they do not always allow for the whole range of possible causes. Only through the help of additional conditions such as the Direct Causation Condition and the Proper Containment Condition postulated by Rappaport Hovav and Levin (2012) can such data be fully taken into account.

Throughout the case studies, I illustrate that obligatory expression of the causer as well as the lack of the anticausative are related to the semantics of the theme argument, since it crucially helps in determining the meaning of the verb phrase. When the verb phrase meaning that arises belongs to the world of human interactions, such as in the case of breaking laws, the event needs to be externally caused and precludes the anticausative. This is how the semantics of the theme correlates with the necessity of direct external causation. In the case studies, I pin down the semantic conditions under which the change of state verbs under discussion, namely *congelar* ‘freeze’, *romper* ‘break’ or *cortar* ‘cut’, are exclusively causative and preclude the anticausative. For now I only point out some of the semantic features that seem to be relevant.

For the sake of the present study, I use the irregularities in the verbal alternations to illustrate that semantic selectional restrictions seem to be much more fine-grained than previously acknowledged. Concretely, the restrictions on the choice of the subject are taken as clear evidence for the fact that the semantic nature of the theme influences the denotation of the whole verb phrase. In other words, I understand that the restrictions imposed on the external argument are different depending on what a verb phrase denotes. The general idea that underlies this approach, and which I will further define in the case studies, is that verbs name more fine-grained functions from arguments to predicates than previously assumed. The semantics of an argument inserted into the predicate-argument structure determines very decisively what predicate the function yields. I approach the present problem as an issue of semantic composition. Most prominently, concerning the

theoretical proposal, I understand the argument alternation irregularities as proof of the need for a sophisticated system of semantic types. Argument realisation possibilities are thus crucially linked to both the semantics of the verb as well as the semantics of the arguments.

3.2 Events described by change of state verbs

Yet another aspect to be taken into account when characterising the class of CoS verbs is the nature of the events they usually describe. In this respect, the aspectual classification by Vendler (1957), as illustrated in (11), has been very influential for the characterisation of verbal predicates in general.

- (11) a. States: *know the answer*
b. Activities: *run*
c. Achievements: *recognise a friend*
d. Accomplishments: *build a house*

The definition of these classes, as well as the discussion of the distribution of distinct verbs in these classes, has generated an important body of research in lexical semantics. Among them, the CoS verbs represent one of the most fruitfully researched classes of verbs. CoS verbs are crucially used to talk about the transition from one state to a newly resulting state. Thus the change event is defined by a transition undergone by an entity that shifts from a particular state A into a state B. That is, there are at least two moments relevant to a CoS event, namely an initial state A and a resulting state B that comes about. The change of state can additionally be brought about by an external instigator. In this case, a CoS event represents a complex event with two subevents. On the one hand, there is the cause subevent, which can involve a particular manner of change and, on the other hand, there is the change of state event, which brings about the resulting state and involves a concrete degree to which the theme is affected by the change.

Given the fact that the external instigator remains optional, two kinds of aspectual templates have been derived for the events described by change of state verbs. For instance, building on Dowty (1979), Rappaport Hovav and Levin (1998, p. 108) have associated CoS verbs with two kinds of lexical templates. Firstly, there is the template that typically represents Vendlerian accomplishments, represented in (12).

- (12) [[y ACT] CAUSE [x BECOME < STATE >]]

This template establishes a relation between an action that involves an agent that causes the change and a change that is undergone by a theme. It thus puts into

relation the cause and the change subevents. The representation makes use of an ACT, a CAUSE and a BECOME operator, which are widely accepted whether they are treated as semantic or syntactic primitives. The <STATE> variable, in turn, predicates over the final state of the theme and is generally described by the past participle form of the represented verb. This part of the template is idiosyncratic to each particular verb, while the operators ACT, CAUSE and BECOME are characteristic of the whole CoS class of verbs.

Secondly, achievements are represented with a simplified template that does not express the external instigator, but exclusively expresses the change of state subevent, as in (13).

(13) [x BECOME < STATE >]

Applying these templates to the verb *romper*, for instance, triggers the following characteristics. The result state relevant for *romper* is ROTO, related to the verbal adjective *roto*, which, unlike simple property states, describes a result state that entails a preceding change of state event (Levin and Rappaport, 1986; Koontz-Garboden, 2012). All actions denoted by the verb *romper* then decompose either into a causative event, as in (14), or into a less complex event template, which lacks an explicit cause, as in (15).

(14) [[y ACT] CAUSE [x BECOME < ROTO >]]

(15) [x BECOME < ROTO >]

This kind of analysis thoroughly addresses variation in the complexity of the event of change in that it provides two templates, one for externally caused changes, as in (14), and another for internally caused changes, as in (15). These standard event representations, however, do not reflect the exact aspectual development of CoS events. That is, the lexical semantic templates are not capable of expressing the duration and gradability of an event and thus do not properly discriminate between an achievement and an accomplishment event. For example, events classified by BECOME may or may not have stages as illustrated by the difference between (16) and (17), where *romper* ‘break’ describes more of an instantaneous event while *congelar* ‘freeze’ describes a durative event.

(16) La taza se rompió en un instante.
the cup REFL broke in an instant
‘The cup broke in an instant.’

(17) El café se congela muy lentamente.
the coffee REFL freezes very slowly
‘The coffee freezes very slowly.’

Given that both of these events would be represented by the BECOME operator, this representation leaves unaccounted for whether an event has or does not have stages. One group of events that very clearly challenges this representation is the group of degree achievement verbs (henceforth DAs). As observed by Dowty (1979), DAs display aspectual ambiguity in as far as they sometimes allow for telic readings and sometimes for atelic readings, as illustrated in example (18).

- (18) a. The soup cooled for an hour.
b. The soup cooled in an hour.

This behaviour does not correspond to the general verbal classification, according to which *for*-adverbials modify atelic predicates, while *in*-adverbials modify only telic predicates, as illustrated in the following contrast.

- (19) a. ??John painted a picture for an hour.
b. John painted a picture in an hour.
(20) a. John walked for an hour.
b. #John walked in an hour.

As a consequence, the standard lexical semantic templates alone are not sufficient to determine the relevant temporal properties that define all CoS events.

Alternatively, Rothstein (2004, pp. 6-14) derives the aspectual classes based on two properties, namely telicity and stages. Telicity is understood to be defined by an inherent endpoint of the event, while the presence of stages defines the development of the event and characterises duration.

The inherent culmination point of events described by change of state verbs can be diagnosed by applying aspectual diagnostics of the kind *en x tiempo* ‘in x time’. According to these diagnostics, the change of state verbs under study here, *congelar* ‘freeze’, *romper* ‘break’, and *cortar* ‘cut’, appear in telic verb phrases.

- (21) La taza se rompió en un instante.
the cup REFL broke in an instant
‘The cup broke in an instant.’
(22) El café se congeló en media hora.
the coffee REFL freeze in half hour
‘The coffee froze in half an hour.’
(23) El sastre cortó la tela en media hora.
the tailor cut the fabric in half hour
‘The tailor cut the fabric in half an hour.’

Apart from the presence of an inherent culmination point, yet another independently motivated property has to be diagnosed for in order to distinguish between

achievements and accomplishments. This is done by the stage diagnostics which is detected by the progressive. While accomplishment events are acceptable in the progressive, achievements rarely appear in the progressive, and when they do so they receive a special kind of interpretation (Vendler, 1957; Piñón, 1997; Kearns, 2003). Therefore, only the progressive of accomplishments proves for stages. This then derives the following binary feature system [\pm , telic; \pm stages], which distinguishes between two kinds of CoS events.

- (24) a. Achievements: [+ telic; - stages]
 b. Accomplishments: [+ telic; + stages]

Intuitively, *romper* ‘break’ and *cortar* ‘cut’ should fall into the group of achievements, while *congelar* ‘freeze’ should pattern with accomplishments. Given that *congelar* can appear in the progressive, as illustrated in (25), it can effectively be identified as an accomplishment.

- (25) El café se está congelando.
 the coffee REFL is freezing
 ‘The coffee is freezing.’

While the progressive is equally possible for *romper*, the existence of stages of the event cannot be straightforwardly concluded. Thus the application of the progressive diagnostics in (26) does not necessarily determine whether the event has actually successfully taken place, such that it remains unclear if the result state has been accomplished or not.

- (26) La taza se está rompiendo.
 the cup REFL is breaking
 ‘The cup is breaking.’

Even more importantly, *romper* may appear in events with and without stages, which results in a difference in the possibility to add proportional modifiers to distinct *romper* events.

- (27) #El silencio se rompió parcialmente.
 the silence REFL broke partially
 ‘The silence broke partially’
 (28) El ligamento se rompió parcialmente.
 the ligament REFL broke partially
 ‘The ligament tore partially.’

In the case of *cortar*, the progressive certainly does apply, although in this case the inherent endpoint seems to stem from the structure of the theme *tela* ‘fabric’.

- (29) El sastre está cortando la tela.
the tailor is cutting the fabric
'The tailor is cutting the fabric.'

These data seem to indicate that the structure of the argument figures into the aspectual properties of a particular verb phrase. Taking this fact seriously leads to the observation that verbs do not easily fit certain aspectual classes.

At least since Verkuyl (1972), research has progressively recognised that the predicate's arguments also influence the aspectual properties of events. Particularly from the studies of Krifka (1989a, 1992, 1998), it emerges that a homomorphism from the degree of change and the temporal course of the event can be established via the extension of the entity that undergoes the event. Technically speaking, what Krifka (1992, p. 39) assumes is a homomorphism from objects to events which maps objects onto events by relating every part of an event, such as drinking, to the parts of the object that undergoes a change, such as a glass of wine (see Krifka, 1992, for a formal definition of homomorphism). The homomorphism thus leads to determining telicity of a given event where a predicate is telic if for any event it describes there is no subevent that does not share the same endpoint, as has been argued by Krifka (1992, 1998); Beavers (2008, In press).

This kind of approach has generated a whole distinct branch of literature identifying temporal progress with scalar change on an incremental argument (Ramchand, 1997; Hay et al., 1999; Krifka, 1998; Beavers, 2008; Rappaport Hovav, 2008). The general assumption in this literature has been that arguments can establish three distinct kinds of homomorphisms to the event. Consumption predicates establish the homomorphic relation to the event via their incremental argument, such as in *John read the book*. Motion predicates base their homomorphism on the path, as in *John walked to the fence*, while change of state predicates take as an incremental argument a particular property that changes in the theme argument, such as in *John froze the milk*.

More recently, the analysis of how arguments figure into the aspectual description of events has been unified in the form of a scalar approach focusing on the changing properties of the argument, such as volume, location, colour, etc. (Hay et al., 1999; Rappaport Hovav, 2008; Beavers, 2008). The scalar analysis is grounded in the idea that properties project scales along which the progress of the event can be tracked. A scalar analysis of verbs (as opposed to verb phrases, see below) thus establishes a relation between the progress of the event, the theme and a scale projected by an attribute lexicalised in the verb. In this way, a homomorphism is created that describes the progress of the event in terms of an increasing change in degrees on a scale. To give, an example the time course of an event of freezing of a lake mirrors the progress in the lake's liquid surface becoming solid.

Below, I focus on the class of CoS verbs and present a more precise picture of the aspectual properties of CoS events employing work on scalar approaches. More concretely, I analyse events described by change of state verbs based on two independently motivated properties: 1) the scale associated with the verb and 2) the scale projected by the mereological structure of the theme.

3.3 Scales at the core of change of state

To set the stage for the analysis in chapters 5 to 7, I use this section to provide a general overview of the idea of treating aspectual properties of verbs in terms of scales. I firstly lay out what kind of scales CoS verbs can be associated with and then go on to explore how the theme contributes to modifying the temporal development of a change of state event. To this end, I introduce the observation that the aspectual properties of CoS verb phrases also depend on the structural complexity of the distinct theme arguments they combine with. This variation in aspectual properties is taken as yet more evidence for a stronger involvement of the theme argument when determining the properties of CoS verb phrases.

As laid out above, change of state verbs generally describe the bringing about of a result. This result is associated with a change in the value of an attribute lexicalised in the verb. For this reason, the class of change of state verbs can easily be analysed in terms of scalar change as explored in detail by Hay et al. (1999) for degree achievement verbs. The change along a scale is understood to take into account the set of ordered degrees on a scale, the ordering of the degrees, which might be increasing or decreasing, and the dimension of measurement that is affected by the change. This leads to a formal definition of a scale as a triple of the kind $\langle S, R, \delta \rangle$, where S stands for a set of ordered degrees, R for the ordering of S and δ for the value that represents the dimension of measurement (Kennedy and McNally, 2005).

Degree achievement verbs like *widen*, *cool* or *dry* have been used most clearly to illustrate the scalar behaviour of verbs associated with their adjectival core (Hay et al., 1999). According to Hay et al. (1999), DAs describe a change along a projected scale related to a path of movement of the affected argument. They thus basically illustrate that the variable aspectual behaviour of degree achievements is due to the fact that the change in the property of the verb is associated with the scalar semantics of the base adjective. The broader claim that emerges from this analysis is that, when the scalar structure associated with the base adjective has a natural bound, the derived verb is telic; when, however, the adjective's scalar structure has no such bound, the verb is atelic.

Extending the analysis of degree achievements by Hay et al. (1999) and the analysis of scalar adjectives by Kennedy and McNally (2005), Kennedy and Levin

(2008) provide an analysis on which the adjectival core of a degree achievement is a special kind of difference function. This difference function measures the amount that an object changes along a scalar dimension as a result of participating in an event. Explicitly they postulate a measure of change function that measures the degree to which an object changes along a scalar dimension due to undergoing an event. The measure of change function is formalised as in (30) (Kennedy and Levin, 2008, p. 18).

(30) Measure of change
 For any measure function \mathbf{m} , $\mathbf{m}_\Delta = \lambda x \lambda e. \mathbf{m}_{\uparrow \mathbf{m}(x)}(\text{init}(e))(x)(\text{fin}(e))$

The measure of change function \mathbf{m}_Δ takes an object x and an event e and returns the degree that represents the amount that x changes in the property measured by \mathbf{m} as a result of participating in e . With ‘init’ and ‘fin’ representing the initial and the final temporal points of the event, the result is a positive difference between the degree to which x measures at the beginning of the event and the degree to which x measures at the end of e .

Following this analysis, verbs that encode measure of change functions need to be type shifted through degree morphology in order to denote properties of events. According to their approach, this is done by the introduction of a null degree morpheme *pos*.

(31) $\text{pos}(\mathbf{m}_\Delta) = \lambda x \lambda e. \mathbf{m}_\Delta(x)(e) \geq \text{std}(m_\Delta)$

The formula in (31) indicates that a verb based on a measure of change function is true of x and e just in case the degree to which x changes by participating in e exceeds the standard of comparison for the measure of change.

According to this approach, it is necessary to determine the standard of comparison involved in the truth conditions of the positive form of a gradable predicate. That is, what has to be determined is a minimum degree required to stand out with respect to the standard of measurement encoded by the verbs under study here, namely *romper*, *cortar* and *congelar*. In general terms, it can be said that the standard is related to the kind of scale encoded by the verb. The exact analysis for each case that I am concerned with in this dissertation will be provided in the corresponding chapters.

The importance of the measure of change function analysis lies in the fact that it generalises over the BECOME operator of Dowty (1979) in that it allows for more complex transitions than just the 0 to 1 shift represented by BECOME. In this way, any change is necessarily understood as a shift along a dimension and when that dimension is a scalar one the corresponding change has intermediate values.

Given its success in explaining the aspectual behaviour of DA verbs by cor-

relating aspectual behaviour with the notion of measure, the scalar analysis has further been extended to describe the aspectual characteristics of the whole class of change of state verbs (Rappaport Hovav, 2008; Beavers, 2008). More recently, the scalar analysis has even been applied to the group of incremental theme verbs, such as *eat* or *read* (Piñón, 2008; Kennedy, 2012). Generally, however, the literature has distinguished between the class of change of state verbs for which telicity as well as the gradability of the event can be directly associated with the scales projected by the lexicalised properties in the verb and the class of incremental theme verbs, which draw their aspectual features from the structure of the theme (Rappaport Hovav, 2008; Kennedy, 2012).

CoS verbs are associated with a scale encoded by the verb, as in example (32), where the successful completion of the event is related to the property of dryness lexicalised in the verb, while incremental theme verbs, as in example (33), owe their scale to the extension of the theme.

(32) The dress dried completely.

(33) John read the book completely.

The scalar account outlined so far successfully explains the aspectual behaviour of distinct gradable predicates. What it does not address, however, is the fact that certain verbs display variable durative behaviour depending on the theme they combine with. Spanish *romper* ‘break’, for example, can appear both in instantaneous event descriptions, such as in (34), as well as in durative events, as in example (35).

(34) #Juan rompió el silencio durante 5 minutos.

Juan broke the silence during 5 minutes
‘Juan broke the silence for 5 minutes.’

(35) La expedición rompió la placa de hielo durante dos horas.

the expedition broke the sheet of ice during two hours
‘The expedition spent two hours breaking the sheet of ice.’

The same contrast appears for *congelar* ‘freeze’, which we naturally assume to describe durative events. Thus *congelar* effectively describes accomplishments when it applies to physical objects, as is illustrated by the measure of duration reading with *en*-adverbials ‘in’-adverbials and future tense. This test illustrates duration, since it makes clear that there are still 5 minutes left for the event to be completed.

(36) La hamburguesa se congelará en 5 minutos.

the hamburger REFL freeze.FUT in 5 minutes
‘The hamburger will freeze in 5 minutes.’

The same test, however, is failed when *congelar* is combined with a theme whose argument is not affected by parts. Instead, what is denoted is the time that elapses before the event takes place.

- (37) #Rabat congelará la ratificación del acuerdo pesquero en una
Rabat freeze.FUT the ratification of the agreement fishing.ADJ in one
hora.
hour
'Rabat will freeze the ratification of the fishing agreement in one hour.'

In the respective case studies in chapters 5, 6 and 7, I provide a selection of tests to illustrate how the structure of the distinct kinds of themes intervenes in determining the duration of the change of state events described by *congelar* 'freeze', *romper* 'break' and *cortar* 'cut'. Here I only use this short selection to make the point that, even though the class of change of state verbs has been fruitfully explored through their scalar properties, it seems that the scalar behaviour of CoS verb phrases does not purely emerge from the scales associated with the verb, on the one hand, or the theme on the other. That is, the scalar analysis of CoS verb phrases turns out to be more complex than establishing either a homomorphism from the association of the progress of an event with a scalar property lexicalised in the verb, or a homomorphism resulting from the relation of the progress of the event to the extension of the theme. Instead, in composition, interaction between the scale projected by the CoS verb and its theme argument can affect the duration of a change of state verb phrase. What I thus argue for and illustrate in detail in the corresponding case studies is that, despite a default telicity and duration that can be associated with each change of state verb, the duration of CoS events can still be affected by the mereological structure of the affected entity. Hence, in addition to a prototypically projected scale, which is grounded in a property lexicalised in the verb and predicts telicity and durativity properties of the verb, it is still important to consider the relevant mereological structure of the theme and whether the affected theme is affected holistically by the change or undergoes the change by parts. To give an example, when a sheet of ice is undergoing a the event of breaking, an event described by a telic and principally non-gradable predicate *break*, the size of the sheet that has to be broken can be used to determine the duration of the event of breaking.

As a formal mechanism to make explicit the structure of the theme in the aspectual computation, I turn to the approach put forward by Kennedy (2012). His proposal builds on the hypothesis that nominals incorporate measure functions as part of their meanings, an idea also present in Krifka (1989b) and Krifka (1992). Thus the effects of the mereological structure of the theme that CoS events are sensitive to can be captured, which, in turn, allows us to account for the con-

trast between durative and non-durative CoS verb phrases described by the same verb. Although I leave the technical details to the case studies, I want to point out the basic hypothesis that underlies the analysis by Kennedy (2012). He basically assumes that individual-denoting determiner phrases (henceforth DPs) may combine with a partitive head which provides a measure of the degree to which a quantity of stuff y constitutes a part of an individual x . I adopt this formalism to provide a formal account of the fact that verb phrases described by change of state verbs can vary in durativity and gradability with the structure provided by the theme and that this variable behaviour essentially depends on whether the theme is conceived as being affected holistically or partially.

In a nutshell, the idea which I will develop in detail in the corresponding case studies is that, if a theme is affected by parts in a gradual property conveyed by the verb, the event is durative and gradable. If, however, the theme is not affected by parts and the property cannot be changed gradually on the theme, the event is punctual. Consequently, CoS events allow for two kinds of events: simple transitions which are telic and punctual and complex transitions which are equally telic but durative. Generalising this means that scalar change not only translates into a scale projected by a scalar property lexicalised by the verb, but also is a matter of degree of affectedness of the theme in that we consider the theme to be holistically or partially affected.

3.4 Chapter summary

In this chapter, I have provided a general characterisation of the group of CoS verbs. I have briefly summarised what has been said about the argument realisation possibilities of CoS verbs so far and have explained to what extent my data challenge these generalisations. Furthermore, I have briefly outlined the kinds of events CoS verbs describe and subsequently argued that a scalar analysis provides more appropriate means to account for the aspectual description of CoS verbs in their interaction with their themes. More concretely, the variable durativity of CoS events has been found to be a matter of the mereological nature of the theme and whether the theme's structure is affected by the CoS event holistically or by parts. For a resolution of this problem, which I will provide in the case studies, I have briefly pointed to the analysis of incremental change put forward by Kennedy (2012). Summing up, this chapter has provided the basic notions that are necessary to understand the detailed analysis I provide for each of the verbs, *congelar* 'freeze', *romper* 'break' and *cortar* 'cut'.

Chapter 4

CORPUS STUDY

Given the richness of the combinatorial paradigm of verbs, I use corpora as a source for data to systematically track argument selection of CoS verbs. For the kind of question addressed in this research, a corpus best provides a full picture of naturally occurring data, which does not emerge from the exploration of native speaker intuitions. The latter often represent the way speakers perceive their own language, rather than the way they naturally use it (Laso Martín, 2009). I thus understand corpora as a source for empirical evidence and verifiable data.

Generally speaking, corpus analysis can be divided into qualitative and quantitative research. For the present study a qualitative study clearly seemed more appropriate. I thus start this chapter with a short discussion of both kinds of corpus research and justify the choice of qualitative corpus analysis with respect to the choice of data to be analysed. I then go on to describe the corpus that was used. Finally I provide a detailed description of the lexicographic annotation methodology used for the data annotation.

4.1 The kind of corpus research and the data set

Out of the two kinds of corpus research, quantitative analysis represents the numerical study of data based on statistical models. Huge amounts of data are generally classified according to previously carefully defined features, which identify the data in a way that it gives information on the phenomenon of interest. Through statistical tools, numerical data are automatically classified and counted. Precise measurements and analyses of the target corpus attempt to explain what is being observed in the huge collections of data.

The fundamental advantage of quantitative analysis is that it allows the automated study of great amounts of data. The picture provided by most of the studies that apply quantitative methods has statistical relevance, which makes them ex-

tendible to further samples of data. This kind of corpus research often explores great varieties of phenomena and is appreciated for its time efficiency. Representative examples of quantitative research on verbs are studies dealing with automated verb classifications based on statistical distribution of the verb's argument structure (Merlo and Stevenson, 2001) or automated induction of semantic classes of verbs (Schulte im Walde, 2006).

For the purpose of the present study, however, this kind of coarse-grained view of data is problematic in at least two ways. Firstly, in point of fact, texts contain words and not word senses. For that reason many studies on verbs which research argument structure provide results based on verbs' and nouns' tokens rather than providing some deeper analysis of the semantics of verbs and nouns and their interaction in context. Secondly, studies on verbs exploring automated learning of selectional preferences of verbs struggle with preconceived taxonomies of nouns, which have the problem that they often lead to wrong frequency counts, since polysemy of nouns is difficult to take into account when talking about frequencies (Ciaramita and Johnson, 2000). This suggests that in contrast to qualitative methods, quantitative studies often represent a less rich description of data and thus are not very interesting for the current research question.

Qualitative research, in contrast, is inductive in that individual researchers, being themselves the main research instrument, build hypotheses, abstractions and theories from detailed data analysis. Its main goal is to provide a description of a group of data that attempts to make visible what is going on in this particular group of data without going into further discussion of whether the data is statistically relevant or not. This principally means that findings from qualitative research cannot be easily extended to wider populations of data with the same degree of certainty that quantitative analyses can. Yet the major strength of qualitative research is the depth to which the data is explored (Myers, 2000). It allows fine-grained distinctions to be made, which grasp the idiosyncrasies of the phenomenon, since the data, unlike in the quantitative method, are not necessarily fitted into a finite number of classes. This is why rare phenomena, borderline cases or ambiguities, as well as minor uses and meaning extensions, are included in this kind of analysis.

The process of data collection and classification plays a crucial role in the research and its findings. Unlike quantitative research, there is no particular framework which defines how qualitative research should be conducted; rather each type of qualitative research is guided by some particular assumptions that are taken by the researcher in adequacy to each phenomenon. This is why the processes of qualitative research are multiple.

Given the goal of the present study, which pursues an in-depth analysis of the combinatorial possibilities of CoS verbs, a qualitative analysis was considered most appropriate. The systematic extraction of data from corpora conducted throughout this research thus represents a way of obtaining evidence for a study

with a strong empirical base. Annotating the argument selection of CoS verbs manually has avoided providing a picture of combinatorial preferences of verbs that is heavily influenced by statistically frequent nouns. This is indeed the problem many quantitative studies run into by computing tokens of nouns, rather than their disambiguated meanings (Resnik, 1993).

As an empirical basis for the qualitative study of combinatorial variation of verbs, I have chosen the semantic group of Spanish change of state verbs. Out of a selection of one hundred Spanish CoS verbs, most of which represent equivalents of the English CoS verbs identified by Rappaport Hovav and Levin (2005), initially 28 verbs were selected according to two criteria: a) their potential semantic complexity and b) the minimal availability of 200 occurrences in the chosen corpus. With respect to the first criterion, I evaluated the potential semantic complexity based on their representative patterns of argument structure and their diversity of selectional context. These characteristics were checked against two crucial Spanish lexical resources, namely, the monolingual dictionary *Diccionario de Uso del Español* (Moliner, 2008) as well as the public Corpus of the Spanish Royal Academy of Language (CREA). The second criterion concerning minimal frequency, in turn, was lexicographical. In lexicography, frequently-used or polysemic verbs are analysed for at least 200 to 500 concordance lines in order to discover the whole variety of common uses and prevent possible biased results due to accidentally frequent uses.

These 28 preliminary chosen verbs were then annotated in the CPA+R interface.¹ Concretely I annotated 200 concordance lines for verbs that were judged to be semantically more complex and 100 concordance lines for verbs that seemed simpler in their combinatory behaviour. These annotated data provided two crucial insights. On the one hand, I gained an impression of the kinds of theme arguments that are typical for change of state verbs as a class. On the other hand, I obtained an idea of the great variety of themes that one individual verb can combine with. This first understanding of the data guided the following step, which was meant to reduce the sample for an in-depth analysis.

The main criteria employed for the reduction of the sample favoured richness of the combinatorial variation with respect to the theme argument. To determine whether a verb had a rich combinatory paradigm, I contrasted my annotated data with the data description of the Spanish combinatorial dictionary *REDES* (Bosque, 2004). The combinatorial dictionary basically provides the combinatorial possibilities of verbs in Spanish by listing lexical classes of arguments. The lexical classes in *REDES* are equivalent to notional groupings of the inventory of arguments attested in the corpus for a particular verb. *REDES*, for example, lists 13 lexical classes of arguments for the Spanish verb *congelar* 'freeze'. Only one

¹<http://marke.upf.edu/cpa/index.php?action=main>

lexical class corresponds to physical objects, while the rest of the classes are of distinct abstract kinds. Only for the physical kind of themes does the verb phrase obtain the meaning of ‘transform into ice’, while for the remaining abstract themes the meaning is phrased as ‘suspend the course of some process’. In this way, the combinatorial dictionary directly suggests that a meaning difference in the verb phrase takes place depending on the verb’s combinatory behaviour. Concretely, *REDES* identifies 12 very fine-grained classes of abstract themes for *congelar*.² The *REDES* lexical classes were only consulted to obtain advice from other research on verb combinatory behaviour. They could, however, not be used directly for the analysis, since the classes seem too fine-grained to provide general insights into the selectional preferences of verbs. Furthermore, *REDES* did not provide much information about possible argument alternations and whether there were differences for the distinct combinatorial patterns. Yet *REDES* was helpful in identifying verbs with a complex combinatorial paradigm. A lower bound of five distinct semantic classes stipulated by *REDES* were chosen as criteria for the identification of the most semantically complex change of state verbs. It has to be mentioned at this point, however, that one of the analysed verbs, namely *romper* ‘break’, was not even included in this lexicographical compendium. In this case, I had to rely exclusively on the corpus data and my linguistic intuition to judge the combinatorial complexity of *romper*. Finally, based on their overwhelmingly rich combinatorial capacity the following three units were chosen for deeper analysis: *romper*, ‘break’, *cortar*, ‘cut’ and *congelar*, ‘freeze’. I chose *romper* and *cortar*, since in their abstract uses they seem to have very similar meanings, while their selectional restrictions differ significantly in the physical domain. *Congelar*, in turn, was chosen because of its difference in aspectual behaviour.

Despite the fact that small qualitative studies are generally considered not to be generalisable to wider populations, I understand that basing my research on some of the most representative members of the class of change of state verbs does allow for a description of some basic frequencies about the verbs’ behaviour and their selectional preferences. Thus I consider that conducting in-depth case studies on a few crucial members of the change of state verb class sheds light on the combinatorics of the Spanish change of state verbs.

²For illustration see the lexical classes in *REDES* for *congelar*: ‘**A** nouns that denote economic compensation as well as gains’: *salario, ingreso, inversión* ‘salary, income, investment’, **B** nouns that denote all other kinds of goods and economic resources, most frequently money deposits, often in plural’: *cuenta, depósito, propiedad* ‘account, deposit, property’ or **D** the noun ‘price’ and other nouns that denote payments of a particular quantity’: *precio* ‘price’, *tasa* ‘tax’, etc.

4.2 Characteristics of the corpus

This section describes the characteristics of the corpus from which concordances were extracted. It justifies its choice and details its composition, considers its representativeness and possible limitations.

At the very beginning of the project the choice of a sense-annotated corpus was taken into consideration. This option, however, was quickly discarded when recognising that automatically sense-annotated corpora systematically draw the semantic values for lexical items from hierarchically organised resources such as thesauri and ontologies. The fundamental problem with this strategy with respect to the present project was that an a priori sense disambiguation works very much in the direction of a sense enumeration lexicon, and does not provide a neutral picture of the combinatorial paradigm of a verb. For this reason I preferred to annotate the corpus manually.

The corpus I finally employed to examine the data is built up from a collection of Spanish press issues obtained from one of the most important Spanish newspapers, the *El País* newspaper, between the years 1976 and 2007. The corpus comprises 250 million running words and was annotated for part-of-speech information and lemmatised with the TreeTagger (Schmid, 1994). The *El País* corpus³ was chosen for three main reasons: 1) it contains lemmatised verb forms, 2) it runs on a tool that provides the possibility of annotating and querying data in a very detailed way, 3) a newspaper corpus was considered more representative of standard language use than other corpora, such as corpora based on literature.

Lemmatisation, that is, the grouping together of different inflectional forms of a word to be analysed as a single item, was a crucial feature for the empirical research of verbs. Likewise the lack of the possibility to access other big reference corpora for Spanish in lemmatised form as of the beginning of 2011, such as the public Corpus of the Spanish Royal Academy of Language (CREA), played a crucial role in the choice of the *El País* corpus.

Another criterion for basing the research on a University-internal corpus, the *El País* corpus, was the freedom of annotation provided only by the query software CPA+R developed simultaneously at the Universitat Pompeu Fabra. In contrast to other interfaces, which only allow the user to store queries, such as the interface of the Corpus del Español⁴, the CPA+R interface makes possible a very detailed annotation of concordance lines, making accessible a verb-by-verb and token-by-token classification of the verb's arguments. In addition, the annotated data can be queried for in the CPA+R surface according to the distinct annotation criteria, thus providing diverse means of analysis. In sum, the interfaces of the free corpora

³The *El País* corpus is maintained and hosted at the Institut Universitari de Lingüística Aplicada (IULA) at the University Pompeu Fabra in Barcelona.

⁴www.corpusdelespanol.org

available for Spanish such as the public Corpus of the Spanish Royal Academy of Language (CREA) or the Corpus del Español were not flexible enough in the annotation and means of consulting the data for the purpose of researching selectional preferences of verbs.

A further important argument in favour of choosing the *El País* corpus was its composition, based on the Spanish press. As has been argued in detail by several researchers (Bosque, 2004; Hanks, 2004), printed, public, non-specific texts best represent a generally accepted contemporary standard of a particular language, in this case Spanish.⁵ In fact, a previous pilot study based on a Spanish web-corpus, which contained data from chat rooms, blogs and private essays, illustrated that on many occasions verbs were employed in a non-standard and often even opaque way to obtain stylistic effects. As a consequence, press data were intentionally selected to represent the sources of evidence employed for this research project.

At this point, it is worth mentioning that it is not deniable that the overall percentages of the distribution of each use of the verb may vary when considering other kinds of text than the press. Nevertheless I still assume, together with Bosque (2004), that a press corpus not only provides appropriate data to allow reasonable generalisations about journalistic language, but journalistic language is also representative of the variety and diversity of what is considered central and typical in a particular language.

4.3 Corpus Pattern Annotation methodology and the CPA+R

This section introduces the Corpus Pattern Analysis methodology (henceforth CPA) chosen for the detailed tracking of the behaviour of verbs in corpus. It explains its application for the purposes of the present study, step by step, and provides a detailed description of the CPA+R query and annotation interface used for the research of corpus concordances.

Thanks to the insights from a previous study (Spalek, 2013) on Spanish and English CoS verbs, it quickly became clear that within the scope of one sentence CoS verbs are semantically sensitive to their theme arguments as well as the syntactic frame they appear in. Consequently, the annotation methodology employed needed to be capable of tracking in great detail both the syntactic patterns and the semantics of the arguments selected by the verb. Responding to these requirements, I chose the CPA annotation methodology. This methodology was developed within a large-scale corpus research project concerned with the use of

⁵See Bosque (2004, p. CLXI) for a detailed discussion on the representativeness of press corpora.

verbs and how they convey meaning. Initiated and developed by the lexicographer Patrick Hanks in collaboration with James Pustejovsky (Pustejovsky and Hanks, 2001; Hanks and Pustejovsky, 2005; ?), CPA represents a corpus-driven research methodology focused on verbs.

The CPA methodology is based on the lexico-centric Norms and Exploitations Theory, which was developed through the process of editing large dictionaries and focuses on stereotypical syntagmatic patterns of verbs and how they contribute to building verb meaning (Hanks, 2004, 2013). It proceeds verb-by-verb and aligns sense and structure. Corpus patterns are thus understood to allow for generalisations over verb uses attested in the corpus. Its general theoretical position is that there is not one meaning to a word, but varying degrees of probabilities to realise a meaningful utterance based on the word's meaning potential (Hanks, 2004). These assumptions directly relate to one of Sinclair's main premises, according to which 'most words do not have independent meaning' (Sinclair, 1991, p. 108), but are stored in patterns. The CPA methodology thus elucidates the relationship between syntagmatic patterns and the resulting meaning for individual occurrences of verbs. In this way, the project also represents part of the real explosion of corpus studies on patterned language usage that has taken place in the last few decades in the study of large corpora (McCarthy, 1997; Ciaramita and Johnson, 2000; Pustejovsky and Hanks, 2001).

Within the CPA methodology, corpus concordance lines are manually classified into selection context patterns for specific verbs. Semantically related syntactic verb patterns consist of the argument groupings which are assigned a semantic value, also called semantic types within the CPA methodology. Semantic types are indicated with double square brackets, such as [[Human]], [[Physical Object]], [[Speech Act]], etc. These semantic values are obtained from item-by-item observation of huge numbers of corpus data and organised in a flexible working ontology serving the CPA project.⁶ In addition, morphosyntactic clues such as prepositional phrases, adverbial modifiers, phrase particles as well as subvalency features play a crucial role in the marking up of verb patterns. That means that distinct syntagmatically relevant criteria such as the presence of a certain prepositional phrase in *treat somebody with respect* versus *treat somebody to dinner* or the absence of a determiner play a crucial role in the definition of verb patterns, since they help in identifying a specific meaning of a verb. Throughout the process of semantic classification of arguments of a particular target verb, a predicate-based clustering of the typical arguments of a verb emerges. For the purpose of lexicographic projects, the CPA methodology then proceeds to assign a meaning implicature for each syntactico-semantic pattern. These implicatures provide hints about the meaning of the verb in a particular pattern. Thus the CPA

⁶For more details about the ontology consult Pustejovsky et al. (2004).

methodology fundamentally maps meanings onto verbs in use, rather than onto the verb itself.

As an illustrative example of the application of this methodology, Hanks (2004, p. 90) shows that the verb *hazard* in British English is combined with the object argument *guess* in at least 40% of the cases. Other prototypical objects, similar to *guess*, are *opinion*, *conjecture* or *definition*. Together they represent about 80% of the themes of the verb *hazard*. That is, the most prototypical use of the target word *hazard* is related to speech acts and propositions that convey uncertainty. These are assigned the semantic type [[Unknown]]:

(1) [[Human]] hazard [[{Unknown = Guess}]]

In the CPA representation of a verb, the verb stands in the middle in normal type, while the argument slots are represented in double square brackets, as illustrated in example (1). Semantic types can further include particularly frequent instantiations separated from the semantic type by an equals sign, as also illustrated in example (1).

For the remaining 20% of occurrences *hazard* selects for valued objects, such as might be a *life* or a *company*:

(2) a. [...] people who hazard their entire company [...]
b. [[Human]] hazard [[Entity = Valued]]⁷

Precisely this possibility of obtaining a semantically motivated cluster of the arguments of CoS verbs, offered by the CPA annotation methodology, was what has made it so relevant for the present project, which is interested in the combinatorial potential of CoS verbs. Nonetheless, the annotation process was adapted to my principal goal in that the CPA patterns were merely marked up to observe the typical selectional behaviour of CoS verbs, rather than providing an inventory of senses. Yet another particularity of the mark-up carried out for the present project was that it particularly focused on variation in the selected theme arguments, giving less emphasis to the choice of the external argument. Subject arguments were only examined in more detail when the choice of the theme argument restricted the choice of the subject in some way. This particular focus on the theme argument is grounded in the data-based observation that themes have a stronger semantic impact on the verb than external arguments, as mentioned in the introduction. This observation is theoretically supported by the structural asymmetry between the subject and the object arguments, as pointed out by Marantz (1984, p. 25) and Verkuyl (1972). The CPA methodology was thus used in this dissertation to identify the relation of a target verb to its arguments and extend the analysis of

⁷<http://deb.fi.muni.cz/pdev/doc.php?action=corpora&id=hazard&num=2>

syntactic subcategorisation to semantic subcategorisation.

For the annotation of the Spanish *El País* corpus I used the query and annotation interface CPA+R.⁸ This interface allowed me to carry out a detailed annotation according to the CPA methodology and yet permitted some adjustments according to the particular interest of my study. Thus, in contrast to the original CPA tool⁹, which directly attributes certain semantic features to each of the verb-argument combinations, the CPA+R tool was redesigned to arrange the data in a more bottom-up way. Crucially, my first annotation step only grouped syntactic patterns independently of the semantic nature of their arguments. Only after the syntactic sorting did I address the semantic nature of the arguments in a particular syntactic pattern. To provide a concrete example, I first annotated a transitive pattern for *romper* in the form [[NP1]] romper [[NP2]] and in a subsequent step identified semantic regularities such as the one illustrated in (3).

- (3) a. [[Human]] romper [[Relation]]
b. [[Event]] romper [[Process]]

This means that, with respect to the original CPA methodology, the splitting into semantically motivated syntactic patterns was delayed. This change in the annotation methodology was motivated by two facts. Firstly, I did not use any a priori ontology of nouns to systematically classify the verb's arguments. Consequently, I had to annotate a considerable amount of data first to gain insight into the possible argument types of a particular verb without committing myself to a concrete semantic classification of arguments. Secondly, and more importantly, given that the present research project was mainly interested in identifying selectional preferences of CoS verbs, rather than pinning down their possible meanings, I restricted the annotation to real arguments only, rather than considering any adverbial modifiers, as the original CPA methodology suggests.

That is to say, my annotation methodology crucially takes into account only arguments of the verb, while the original CPA methodology considers any syntagmatically relevant criteria that can help to specify a particular sense of a verb. This is due to the fact that the present study is interested in the selectional preferences imposed on the arguments, while the original CPA annotation methodology pursues the lexicographical goals of providing the most appropriate definitions of words as well as indications of the prototypical uses of verbs. Thus, within the CPA project, adverbial modification and valency features, as illustrated in the contrasts between (4) versus (5) versus (6) are taken into account, which I did not consider.

⁸<http://marke.upf.edu/cpa/index.php?action=main>

⁹The original CPA was developed by Pavel Rychly at Masaryk University.

- (4) a. Children should treat their parents respectfully.
b. [[Human]] treat [[Human]] [Adv [Manner]]
- (5) a. The doctor treats Peter with homeopathy.
b. [[Human]] treat [[Human]] with [[Medicine]]
- (6) a. The old man treated him to a drink.
b. [[Human]] treat [[Human]]{to [[Event]]}¹⁰

Below, I describe the annotation process step by step, given that it provides clear clues for the analysis that I was able to conduct based on the annotated corpus data. The marking up process consisted basically of five subtasks: 1) concordances were imported for each target verb from the Spanish press corpus into the CPA+R query and annotation interface; 2) a random sample of concordance lines was annotated according to their syntactic realisation patterns 3) each argument in a particular syntactic pattern was annotated semantically; 4) in a generalisation step regular syntactic alternations were linked and, if possible, semantically distinct patterns were grouped into semantically more abstract classes; 5) I cross-checked with a contrast corpus in some cases where my linguistic intuition made me suspect that a certain use of a concrete verb was absent and yet important. These subtasks are described in more detail below.

1. Concordances

Faced with the great number of concordances available for each verb, I limited the importation of concordance lines corresponding to one verb to a maximum of 1000 randomly chosen hits. 1000 concordance lines were thus extracted for each verb and automatically checked for total repetitions. That is, if within these 1000 hits some sentences were repeated, they were automatically discarded in order not to duplicate identical data. This, for example, was the case for *romper*, for which, after discarding full repetitions, 868 concordance lines remained available for annotation. Following the currently common practice in lexicography for a qualitative exploration of large corpora, I annotated a representative sample out of the 1000 imported examples. On average, complex verbs, that is, verbs for which dictionaries provide many senses and verbs that had a wide range of combinatorial contexts such as *romper*, were marked up with approximately 200 concordance lines. This amount roughly corresponds to half of the amount of concordances which are analysed throughout professional lexicographic works. The reduction to 50% was necessary for time reasons. Thus highly complex verbs were annotated for at least 200 concordance lines, while less complex verbs such

¹⁰In the CPA annotation methodology elements within curly brackets, such as {to [[Event]]} indicate syntactically optional constituents.

as *acortar* ‘shorten’ were marked up with about 100 to 150 concordance lines. In addition, in both cases a number of non-marked-up concordance lines were examined without annotation to make sure that no low-frequency patterns were missing from the annotated data.

2. Syntactic annotation

As illustrated in figure 4.1, the CPA+R interface displays computer-generated sets of one-sentence concordance lines for which the target verb that represents the node is marked in red for visual convenience. It uses an extended one-sentence environment instead of the almost universally used Key Word In Context format (KWIC) (Luhn, 1960), which prints a line of text of between one to five words on either side of the word under examination. The trimmed KWIC environment is usually considered a reasonable length to study the collocates and attracted elements with respect to the node word. Yet it turned out to be insufficient to analyse the whole argument structure of a verb. For this reason, the more extent one-sentence length was established as standard, sacrificing the visual benefit of providing keyword-aligned short text lines. In some cases, even more than the one sentence environment was necessary for a closer study.

Figure 4.1 provides a view of the annotation interface, where already annotated concordance lines highlight the argument selection in colours. This is the visual result of a manual process of identifying each argument with its position numbers in the sentence.

Corpus Pattern Analysis tool

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Sentences for romper (VRB)

868 records • showing 0 - 200 • next

edit	pattern	Args	sentence
55248	1	1+2+3+4;11+12+13+14	Las piedras y ladrillos lanzados por los gamberros, rompieron varios cristales del autocar, lo que produjo el natural pánico entre la expedición.
55249	3	1+2+3+4+5+6;13+14+15	Su obra <i>Longa noite de pedra</i> , que para muchos rompía con el esteticismo de la poesía gallega.
55250	1	9+10+11;13+14+15	Como consecuencia de la tensión producida, los dos países rompieron sus relaciones diplomáticas hace un mes.
55251	1	60+61;63	com/ articulo/ internacional/ Islandia/ acusa/ Gran/ Bretana/ provocar/ incidentes/ elpepiint/ 19760509elpepiint_5/ Tes Islandia acusa a Gran Bretaña de provocar los incidentes El gobierno británico está poniendo muy poco de su parte para resolver pacíficamente la « guerra del bacalao », según la embajada noruega en Gran Bretaña, que representa aquí los intereses de Islandia, desde que este país rompió relaciones con el gobierno de Londres.
55252	1	1+2;11+12	Las piedras y ladrillos lanzados por los gamberros, rompieron varios cristales del autocar, lo que produjo el natural pánico entre la expedición.
55253	1	9+10+11;13+14+15	Como consecuencia de la tensión producida, los dos países rompieron sus relaciones diplomáticas hace un mes.
55254	1	1+2;10+11	Sus representantes, en cada caso, se rompen la crisma contra la indiferencia de los franceses.
55255	3	1+2+3+4+5;14+15+16	Quico Pi de la Serra, por ejemplo, rompía con su actuación un largo boicot de años.
55256	2	28+29	En pocas palabras, durante los años de Franco la sociedad española ha evolucionado precisamente como no le hubiera gustado a Franco que evolucionara, rompiendo todos los moldes que él y los suyos habían preparado sucesivamente, pues, rotos unos, preparaban otros que volvían a romperse .

Figure 4.1: Syntactic Annotation

To the left, pattern numbers identify predicate-based groupings of concor-

dance lines with the same syntactic structure. As mentioned above, the first stage distinction of patterns only took into account syntactic realisation possibilities of a particular verb and ignored the semantic type of the theme. Thus three patterns for the verb *romper* could be distinguished: a transitive pattern identified by pattern number 1, an anticausative pattern marked with pattern number 2, and a pattern containing the preposition *con* ‘with’ identified with pattern number 3.

It is worth mentioning at this point that in line with the goal of studying the typical free combinations of CoS verbs, no clear metaphors such as *romper el hielo* ‘break the ice’ in (7-a) or *romper el corazón* ‘break someone’s heart’ in (7-b), and no phraseology such as *romper una lanza a favor* ‘to stand up for’ in (7-c) were considered for annotation and the subsequent analysis. The data I have annotated crucially allows for sentence-internal modification, which suggests that these are cases of free composition.

- (7) a. Se rompe el hielo entre el Vaticano y monseñor
REFL break the ice between the Vatican and monsignor
Lefébvre.
Lefébvre
‘Relations are thawing between the Vatican and Monsignor Lefébvre.’
- b. Sentirse rechazado puede romper el corazón.
feel.REFL rejected can break the heart
‘Feeling rejected can break your heart.’
- c. No deja de ser paradójico que un Gobierno de designación
not leave of be paradox that a government of designation
digital rompa una lanza en favor de la soberanía de los
digital breaks a lance in favour of the sovereignty of the
electores.
voters
‘It continues to be paradoxical that a government created by appointment should come out so strongly in favour of the sovereignty of the voters.’

3. Semantic annotation

During the semantic annotation phase, the first-stage syntactic patterns were sorted into semantically motivated groups. This was done through the assignment of semantic labels to the target verb’s arguments. It represented a manual process determined on the basis of insight into the empirical data and considering only some hints from monolingual Spanish dictionaries or from WordNet. That is to say, the process of classification of nouns was mainly driven by my linguistic intuitions,

rather than by a consistent use of external lexical classifications. It thus required a decisive amount of introspection to assign particular noun phrases to sufficiently fine-grained and yet general semantic classes such that insightful generalisations about selectional preferences of the target verb could be obtained. As a result, the previously identified syntactic patterns ended up displaying detailed semantic information about the prototypical theme arguments of each of the annotated verbs.

Through the annotation process, it turned out that CoS verbs select for abstract nouns in a completely natural way. In fact, the number and variety of abstract nouns that CoS verbs typically select for was so overwhelming and hard to grasp that any generalisation seemed an impossible task at the very beginning. For this reason I decided to consult information from diverse lexicographic work as well as lexical databases to help me gain insight into a possible semantic classification. This recourse to already existing external lexical classifications was necessary to inspire the linguistic criterion for an accurate classification, yet it did not represent a systematic use of external lexical data bases.

Concretely I used, for example, some information from the classification of abstract nouns provided by the *Nueva Gramática de la Lengua Española* (henceforth NGLE) ‘New Grammar of Spanish Language’ (Real Academia Española, 2009). To give an example, the NGLE helped to disambiguate all *-ción* nouns in the context of *cortar* ‘cut’ as nouns of action¹¹, though they potentially could as well denote the effects of the action.

- (8) Estados Unidos corta su contribución al Banco Interamericano
United States cuts its contribution to the Bank Interamerican
‘The United States stopped contributing to the Interamerican Bank.’

For many of the theme arguments, and particularly non-derived nouns, I used monolingual Spanish dictionaries as an orientation for the semantic classification of abstract nouns. In particular, I consulted the *Diccionario de Use del Español* (Moliner, 2008) and the *Diccionario de la Real Academia Española* (Real Academia Española, 2001) to obtain clues about what kinds of hypernyms they used in their definitions of the queried nouns and which senses were disambiguated there. In the cases that were difficult to classify, I even turned to a lexical taxonomy of English, namely WordNet (University, 2010).

It is important to emphasise here that all these external resources consulted for general orientation do not represent a systematic taxonomy the present study is committed to. I avoided committing to any external sense inventory for several reasons. Firstly, many taxonomies such as the one provided in *REDES* or monolingual dictionaries were too fine-grained to account for the behaviour of the target

¹¹In a later stage in unifying the results these nouns were actually labeled as [[Event]].

verbs. Secondly, any particular taxonomy is the result of several methodological choices that obey the purpose of a particular project and none of the consulted external resources coincided with the purpose of the present project. Most importantly, however, I did not want to anticipate or bias the results of the present study by any pre-determined taxonomy.

It is worth mentioning at this point, as well, that English WordNet classifications were preferred to the Spanish WordNet (Fernández-Montraveta et al., 2008) for several reasons. First of all, the Spanish WordNet is significantly smaller than the English WordNet and many lemmas were simply missing from the Spanish WordNet. More importantly, however, the English WordNet displays a much richer network of semantic and lexical relations than the Spanish WordNet. This is due to the fact that the Spanish WordNet was planned as a more compact version of WordNet and intentionally avoids a very fine-grained sense disambiguation (Carrera et al., 2008). The English WordNet, with its explicit and very fine-grained lexical relations, was thus considered to be much more inspiring for the semantic annotation and grouping of arguments of CoS verbs. It is of course clear that the English synset-classification, that is, the classes of disambiguated senses of nouns, is not directly transferable to Spanish nouns, since the same noun establishes distinct relations and shows distinct degrees of polysemy in each language.¹² Yet the English classification turned out to be illuminating and stimulating for my linguistic intuition, even if could not be used as a ‘gold standard’.

Taking as an example the nouns *relación* ‘relation’ versus *aislamiento* ‘isolation’ with respect to the verb *romper*, WordNet helped to obtain the initial insight that *relación* most frequently represents a top node <Relation>, which contains distinct types of relations. *Isolation*, on the other hand, in the context of the verb *romper*, could be identified as a <State>. After contrasting them with the Spanish data and insights from my linguistic intuition, a similar classification was applied for Spanish. That is, during the semantic classification of arguments, [[Relation]] was identified as a semantic class of its own with respect to the verb *romper*. To this semantic class I then attributed nouns such as *relación* ‘relation’, *vínculo* ‘tie’ and *alianza* ‘alliance’, among others. *Aislamiento* ‘isolation’, in turn, was included as an instantiation of the semantic class [[State]]. This class was further attributed to nouns such as *equilibrio* ‘balance’, *confianza* ‘confidence’, *falta de entendimiento* ‘lack of understanding’ or *dominio* ‘control’.

Figure 4.2 illustrates how the argument fillers were annotated semantically for the combination of *romper* with *relación* ‘relation’. In this case, the concordance line displays a transitive use of the verb *romper*. Both arguments in the text-string *los dos países rompieron sus relaciones diplomáticas* ‘the two countries broke off

¹²See Fernández-Montraveta et al. (2008) for more details on cross-linguistic incoherence for lexical equivalents in English and Spanish.

diplomatic relations’ were annotated with grammatical and semantic information. *Filler 1* stands for the subject argument ‘los dos países’, while *Filler 2* represents the object argument ‘sus relaciones diplomáticas’. Out of each filler-text string the lemma was annotated specifying in ‘Slot grammar’ whether it is used in singular or plural in the given concordance. Each lemma was then attributed to a semantic class. In the case of the subject argument ‘los dos países’, the noun was identified as a [[Group]] with the optional additional information on a specific kind of group, namely a political union. The same process was completed for the theme argument, which in this case was attributed to the semantic class [[Relations]].

CPA+R
Corpus Pattern Analysis tool

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Sentence - Pattern Edit

edit Como consecuencia de la tensión producida , los dos países rompieron sus relaciones diplomáticas hace un mes .

Pattern:

Filler 1		Filler 2	
Slot type	NP1	Slot type	NP2
Slot class	NP	Slot class	NP
Filler string	<input type="text" value="los dos países"/>	Filler string	<input type="text" value="sus relaciones diplomáticas"/>
Filler lemma	<input type="text" value="país"/>	Filler lemma	<input type="text" value="relación"/>
Slot grammar	<input type="text" value="plural"/>	Slot grammar	<input type="text" value="plural"/>
Exploitation	<input type="text"/>	Exploitation	<input type="text"/>
Filler position	<input type="text" value="9+10+11"/>	Filler position	<input type="text" value="13+14+15"/>
Thematic Type	<input type="text" value="+c +m"/>	Thematic Type	<input type="text" value="-c -m"/>
Semantic Class	<input type="text" value="Group Political Union"/>	Semantic Class	<input type="text" value="Relations"/>
Notes	<input type="text" value="Metonymy human/ organization"/>	Notes	<input type="text"/>

Figure 4.2: Semantic Annotation 1

Figure 4.3 illustrates the annotation of the combination of *romper* with *aislamiento* ‘isolation’. In this case, the subject argument ‘El estado Español’ is also attributed to the semantic class [[Group]], while the theme argument *aislamiento* ‘isolation’, according to the previous explanation, is identified as an instantiation of the semantic class [[State]].

Throughout this process of assigning arguments to distinct semantic classes, a flexible, corpus-based ontology of verb arguments emerged. In figure 4.4 I illustrate how the systematic classification into semantic classes provides a distribution of the verb’s arguments into classes that turned out to repeat throughout the 200 annotated corpus examples. Figure 4.4 thus clearly shows how the semantic classes [[Process]] and [[Relation]] represent several instances of theme arguments for the verb *romper*. More concretely, it can be observed that lemmas such as *carrera de armamento* ‘arms race’, *desarrollo* ‘development’ as well as

Sentence - Pattern Edit

edit **El Estado español**, que atravesaba el momento más bajo de su prestigio internacional, debido a los juicios y condenas de los terroristas, necesitaba urgentemente algo que pudiera presentar como un triunfo diplomático, y **romper su aislamiento**.

Pattern:

Filler 1

Slot type	NP1
Slot class	NP
Filler string	<input type="text" value="El Estado español"/>
Filler lemma	<input type="text" value="estado español"/>
Slot grammar	<input type="text" value="sing"/>
Exploitation	<input type="text"/>
Filler position	<input type="text" value="1+2+3"/>
Thematic Type	<input type="text" value="+c +m"/>
Semantic Class	<input type="text" value="Group Political Union"/>
Notes	<input type="text"/>

Filler 2

Slot type	NP2
Slot class	NP
Filler string	<input type="text" value="su aislamiento"/>
Filler lemma	<input type="text" value="aislamiento"/>
Slot grammar	<input type="text" value="sing"/>
Exploitation	<input type="text"/>
Filler position	<input type="text" value="39+40"/>
Thematic Type	<input type="text" value="-c -m"/>
Semantic Class	<input type="text" value="State"/>
Notes	<input type="text"/>

Figure 4.3: Semantic Annotation 2

salida pacífica ‘peaceful exit’ or *negociación* ‘negotiation’ were attributed to the [[Process]] semantic class, while *relaciones* ‘relations’, *vínculos* ‘tie’ or *enlace* ‘connection’ were classified as instances of the semantic class [[Relation]]. This classification process provided a coarse-grained picture of the typical arguments of a particular verb.

What has to be emphasised here is that this assigning of arguments to particular semantic classes was verb-driven and occurred bottom-up and thus represents a flexible predicate-relevant grouping of arguments. That means that the semantic nature of each noun was considered with respect to the verb with which it appeared and was not permanently attributed to a particular semantic class. This is due to the observation that one noun could appear with subtle semantic differences for one and the same verb or be classified differently for distinct verbs, as I will elaborate on further below. This flexible classification of nouns is correlated with the fact that nouns naturally possess multiple aspects. Thus a noun like *isolation* is classified in WordNet with four possible senses, namely <state>, <feeling>, <process>, <act>. In the context of the verb *romper* ‘break’, *isolation* was attributed to the [[State]] semantic class, as illustrated above. The crucial benefit of such a flexible predicate-based clustering, as expressed by Hanks and Jezek Hanks and Jezek (2008, p. 391), is that it ‘preserves, albeit in a weakened form, the predicative benefits of hierarchical conceptual organisation, while maintaining the empirical validity of natural-language description’.

edit	la peligrosa espiral de la carrera de armamentos	carrera de armamento	Process	« O bien la carrera de , armamentos pondrá en entredicho el desarrollo de la humanidad en la vía del progreso -dijo Brejnev- , o bien los pueblos del mundo conseguirán romper mediante gestiones conjuntas la peligrosa espiral de la carrera de armamentos .
edit	el desarrollo orgánico de la inelectualidad del p	desarrollo	Process	Si se matiene en el ámbito de la ley no irá a la cárcel La novela Doctor Zhivago , de Boris Pasternak , no se ha publicado en la URSS por la oposición que encontró en nuestra sociedad , por haber tratado de demostrar que la revolución de octubre rompió el desarrollo orgánico de la inelectualidad del país .
edit	la salida pacífica	salida pacífica	Process	Extremistas de distinto origen coinciden en estos días en un punto : la necesidad de romper la salida pacífica hacia una fórmula de democracia europea .
edit	las negociaciones	negociación	Process	la decisión de romper las negociaciones con el Poder , tomada mientras se encontraba en Israel en compañía de los máximos dirigentes de la Internacional Socialista .
edit	su racha victoriosa	racha	Process/ Time Interval	de los 100 metros vallas , y aunque parezca increíble , el cuadro de vencedores de Montreal sólo rompió su racha victoriosa para la RDA en el lanzamiento de peso .
edit	la racha de victorias italianas	racha	Process/ Time Interval	El encuentro de hoy es particu larmente delicado para el Madrid que rompió la racha de victorias italianas en la final de la Copa Intercontinental , ya que de perder se vería necesariamente obligado a ganar en Moscú y Varesse .
edit	relaciones	relaciones	Relation	com/ articulo/ internacional/ Islandia/ acusa/ Gran/ Bretana/ provocar/ incidentes/ elpepiint/ 19760509elpepiint_5/ Tes Islandia acusa a Gran Bretaña de provocar los incidentes El gobierno británico está poniendo muy poco de su parte para resolver pacíficamente la « guerra del bacalao » , según la embajada noruega en Gran Bretaña , que representa aquí los intereses de Islandia , desde que este país rompió relaciones con el gobierno de Londres .
edit	los vínculos de lealtad	vínculos	Relation	El humanismo « yo-céntrico » , al identificar libertad con independencia , y reducir el « yo » al « yo-individual » , rompe los vínculos de lealtad que integran el « yo-individual » , con el « yo-social » o « nosotros » , en el « yo-personal » , cuya encarnación más entrañable es la Patria , núcleo de tensiones de armonía entre la conciencia individual y la conciencia asociativa .
edit	un enlace con la clase obrera occidental	enlace	Relation	Los verdaderos problemas entre el comunismo occidental y el oriental quedarán por discutir y la flexibilidad de la URSS del principio « diversidad en la unidad » , está dictada más bien por la necesidad de no querer romper un enlace con la clase obrera occidental .

Figure 4.4: Semantic Classes for *romper*

4. Generalisation over individual patterns

This step of syntactico-semantic generalisation over the identified patterns was based on the idea that verb meaning is much more coarse-grained than usually assumed and that many of the patterns identified in the above steps are motivated by the same semantic core of the verb, rather than different meanings of one verb.

After the grouping of concordance lines into initially relevant semantic and syntactic patterns, these patterns were reviewed with the purpose of linking possible semantic and/ or syntactic alternations. Two kinds of criteria were considered for this linking: 1) I considered whether the same syntactic patterns with distinct semantic class arguments corresponded to the same VP meaning. If that was the case, distinct semantic classes were grouped together as different instantiations of one superpattern; 2) I observed whether syntactically distinct patterns with the same semantic class of arguments could be considered a regular syntactic alternation.

Thus, for example, the anticausative pattern of the causative-anticausative alternation for CoS verbs was linked to the causative pattern as a satellite pattern. This step of generalising over the initially identified patterns was very crucial for the present investigation of selectional preferences of verbs, since it allowed for some generalisations concerning the behaviour of a particular target verb.

Mention should also be made at this point that this step is absent from the original CPA methodology. These alternations are strictly different realisations of the same semantic norm. To give an example, the CPA methodology considers examples (9-a) and (9-b) alternations of the same pattern for the verb *treat*, while syntactic alternations are not linked within the original CPA methodology,

but rather considered separately. This very fine lexical granularity is due to the lexicographic necessity of distinguishing and depicting all kinds of semantic variation which might potentially lead to distinct senses or simply help learners to use the verb correctly.

- (9) a. The doctor treats John.
 [[Human]] treat [[Human]]
 b. The chemotherapy treats John.
 [[Med-Procedure | Institution]] treat [[Human]]

In the present study, however, I consider alternations to be either semantic or syntactic. Semantic alternations represent various semantic instantiations within the same syntactic pattern. For example, several semantic classes of themes can appear grouped together in a syntactic superpattern, if the overall meaning does not seem to vary significantly. Example (10) illustrates three initially separate patters which were grouped together in the generalisation step.

- (10) a. Juan rompió la amistad (con María).
 Juan broke the friendship (with María)
 ‘Juan ended his friendship (with Mary).’
 [[Human | Group]] romper [[Relation]]
 b. El PSOE rompió la unión de los partidos de izquierda.
 the PSOE broke the union of the parties of left
 ‘The Spanish Socialist Party broke the union of the left parties.’
 [[Human | Group]] romper [[Union]]
 c. Juan rompió el silencio.
 Juan broke the silence
 ‘Juan broke the silence.’
 [[Human | Group | Event]] romper [[State]]

All examples like those in (10) were considered to be instantiations of a broader pattern, namely the [[CAUSE]] romper [[STATE]] pattern. The semantic class [[STATE]] thus represents a hypernym to the semantic classes [[Relation]], [[Union]] and [[State]]. With respect to the notation, it is worth mentioning that the patterns that include subpatterns were annotated in capital letters.

A syntactic alternation, in turn, represents an alternation in the syntactic realisation related to a particular semantic class of arguments. Thus a causative pattern like in (11) was linked to its anticausative counterpart in (12).

(11) [[Human | Group]] romper [[Relation]]

(12) [[Relation]] REFL *romper*

Following these criteria, figure 4.5 illustrates the patterns identified for *romper*.

Patterns for *romper* (VRB)

23 records

#	%	pattern
sentences edit 33	74%	[[CAUSE]] romper [[EVENTUALITY]]
sentences edit 28		instantiation (1) [[CAUSE]] romper [[STATE]]
sentences edit 12		instantiation (8) [[Human Event]] romper [[Union]]
sentences edit 14		instantiation (17) [[Human Group Act]] romper [[Norm]]
sentences edit 11		instantiation (28) [[Human Group Event]] romper [[Relation]]
sentences edit 15		alternation (3) [[Relation]] REFL romper
sentences edit 13		instantiation (40) [[Human Group Event Doctrine Instrument]] romper [[State]]
sentences edit 16		alternation (3) [[State]] REFL romper
sentences edit 30		instantiation (1) [[HUMAN INSTRUMENT]] romper con [[COMMITMENT]]
sentences edit 19		instantiation (4) [[Human Group State Information Obj.]] romper con [[Doctrine]]
sentences edit 24		exploitation (4) [[Human]] romper con [[Time Interval]]
sentences edit 23		exploitation (5) [[Human]] romper con [[Norm]]
sentences edit 32		exploitation (9) [[Human Group]] romper con [[State]]
sentences edit 21		instantiation (6) [[Human Group]] romper con [[Human Group]]
sentences edit 10		instantiation (18) [[Human Group Event]] romper [[Process]]
sentences edit 17		alternation (4) [[Process]] REFL rompe
sentences edit 1	8%	[[Discarded]] rompe [[Discarded]]
sentences edit 8	6%	[[Human Instrument]] romper [[Physical Object]]
sentences edit 9	5%	[[Human]] romper [[Group]]
sentences edit 31	4%	[[Huma Instrument]] romper [[Act]]
sentences edit 29	1%	[[Human Nat Kind]] romper a [[VERB]]
sentences edit 2	1%	[[Exploitation]] REFL romper
sentences edit 6	1%	[[Se_undefined]] romper [[NP2]]
add a new pattern		

Figure 4.5: Patterns for *romper*

As can be seen in figure 4.5, and better consulted in the CPA+R interface, the ‘pattern’-column displays 23 distinct manually identified patterns for the verb *romper*. These are ordered hierarchically according to their frequency and the superpatterns they belong to, if there are any. Thus the superpattern [[CAUSE]] romper [[EVENTUALITY]] represents 74% of the total for annotated examples. Within this pattern we find three patterns considered semantic instantiations of the superpattern, namely [[CAUSE]] romper [[STATE]], [[HUMAN | INSTRUMENT]] romper con [[COMMITMENT]] and [[Human | Group | Event]] romper [[Process]]. The pattern [[CAUSE]] romper [[STATE]] and [[HUMAN | INSTRUMENT]] romper con [[COMMITMENT]], in turn, comprise several subpatterns as well as their corresponding syntactic alternations.

Detailed observations arise from figure 4.5. This figure clearly illustrates that the anticausative alternation considered to be regular for CoS is not encountered across the board. Similar observations have been made in theoretical studies by Levin and Rappaport Hovav (1995) and Piñón (2001), though not acknowledged as systematic for the verb behaviour, but often attributed to metaphorical uses of verbs with no systematic predictions about when they are possible. As I will argue

extensively in the case study of *romper* in chapter 6, the lack of the anticausative for some instances of *romper* is related to the semantics of the theme, namely to norm-denoting themes, classified here under the pattern [[Human |Group |Act]] romper [[Norm]]. Even more interestingly, it semantically restricts the causing argument.

Summing up, syntactically many patterns turned out to be satellite patterns of other syntactic realisations of a particular verb, thus representing regular alternations, while many patterns distinguished by the type of semantic class proved to be instantiations of one more general semantic norm. This step of linking distinct semantic patterns and syntactic alternations of semantically motivated patterns allowed me to gain an overview of the selectional preferences of change of state verbs. It provided insights into the type of arguments a particular verb actually selects for and which of them allow for regular syntactic alternations such as the omission of the external argument. What is thus provided in figure 4.5 is the big picture of the combinatorial regularities of the verb *romper*, which at the very beginning of the study seemed so difficult to grasp.

5. Additional data

Despite the considerable size of the *El País* corpus, I employed the Corpus del Español and even the Web in some cases. This additional contrasting was considered necessary, given the fact that any corpus, however large, might not be sufficient to account exhaustively for all possible instances of language. Thus in cases where my linguistic competence in Spanish or simply my intuition seemed to indicate that there was some more research to be done about a particular pattern, I turned to these additional sources for data.

To give an example, one concrete item that was missing from the annotated data in the *El País* corpus for the verb *romper* was the anticausative use with physical objects. The Corpus del Español, on the other hand, did contain this kind of data, as a manually collected sample of concordances illustrates:

- (13) a. O una radiografía, de esas que tenemos en casa de cuando
 or a radiography of those that we have in home of when
 se nos rompió el brazo!
 REFL us broke the arm
 ‘Or one of those x-rays we have at home from when we broke an arm.’
- b. Se rompió la bolsa en la madrugada.
 REFL broke the bag in the dawn
 ‘The bag tore at dawn.’

This particular lack of data illustrates that even a very large collection of texts

may be missing some data. In the words of Sinclair (1991, p. 45), and in the minds of many theoretical linguists, ‘an occurrence of zero or close to zero may be just a quirk of the sample’. It certainly points out that distinct uses of verbs have different frequencies, something many corpus studies confirm over and over again.

4.4 Main difficulties in the annotation

As already hinted at above, the classification of nouns and their attribution to particular semantic classes was neither easy nor straightforward. In some cases nouns seemed to map quite neatly onto particular semantic classes. This was, for example, the case for all deverbal nouns that usually appear in object position with the verb *romper* ‘break’, such as *desarrollo* ‘development’ in example (14-a), *negociaciones* ‘negotiations’ in (14-b) or *mejora* ‘improving’ in (14-c). They quite easily could be considered processes.

- (14) a. la revolución de octubre rompió el desarrollo orgánico de la
the revolution of October broke the development organic of the
intelectualidad del país.
intellectuality of the country
‘The October Revolution killed the growth of local intellectual life
in the country.’
- b. [...] la decisión de romper las negociaciones con el poder
the decision of break the negotiations with the power
‘The decision to break negotiations with with those in power’
- c. Telefónica rompe la mejora de la Bolsa.
Telefónica breaks the improvement of the stock market
‘Telefónica killed the growth of the stock market.’

Other arguments, however, did not seem to map so neatly onto any particular semantic class. That was the case for the noun *convivencia* ‘living together’ in example (15).

- (15) Como modesto cristiano [...], expreso mi condolencia a los
as modest Christian I express my condolence to the
familiares de las víctimas y pido a Dios vehementemente que
families of the victims and I demand to God vehemently that
actos como estos, que rompen la convivencia nacional, no se
acts like these which break the living together national no REFL
vuelven a repetir.
turn to repeat

‘As a modest Christian, I express my condolence to the families of the victims and I vehemently beg that God will not allow acts like these, acts that destroy our shared way of life, to happen again.’

The dictionaries I consulted, *Diccionario de Uso del Español* (DUE) (Moliner, 2008) and the *Diccionario de la Real Academia Española* (Real Academia Española, 2001), both defined *convivencia* mainly as an ‘action of living together’, which could principally be attributed to the semantic class [[Process]]. Yet the narrow context related to terrorism pointed more towards an interpretation of *convivencia* as a ‘state of being able to live together’. Likewise the DUE did actually contain a definition that denoted a state of living together in a peaceful way: ‘relation between those who live together, particularly the act of living together in harmony’. Thus the noun *convivencia* ‘living together’ as an object of the verb *romper* was finally attributed to the class of [[Relation]].

Even more tricky were the cases where one noun could appear with subtle semantic differences for distinct verbs, as I pointed out above. To illustrate more clearly the complexity of the data in this respect, the noun *relación* appeared perfectly naturally with the verb *romper* and with the verb *congelar*. In each of these cases, however, it seems to display subtle semantic differences, such that it resembles more of a state in (16) and more of a process in (17).

- (16) Ricky Martin rompió su relación sentimental.
Ricky Martin broke his relation sentimental
‘Ricky Martin broke off his relationship.’ [*El País Corpus*]
- (17) Este país congeló relaciones con el gobierno de Londres.
this country froze relations with the government of London
‘This country froze relations with the government of London.’
[*El País Corpus*]

The problems encountered during the classification illustrate that a salient characteristic of the identified semantic classes is that they are in fact flexible, as pointed out by Hanks and Jezek (2008). Crucially, however, they are verb-driven. Thus, according to what we predicate of a noun, the noun can be forced to receive a distinct classification.

4.5 Chapter summary

In this chapter, I have elaborated on the importance of corpus data for linguistic studies. After brief examination of the two major types of corpus research, I have defined the present research as a qualitative study that combines a strong empirical basis with the available theoretical studies.

After justifying the choice of corpus and the data sample, I devoted most of the chapter to explaining the basics about the corpus query surface, CPA+R, the lexicographic annotation methodology CPA, as well as the way I adapted this methodology for the purpose of my research. In a step-by-step explanation of the methodology, I have also pointed towards some results of this systematic tracking of verbs, the problems it entails and the decisions taken to resolve them.

However, I have emphasised that, despite the importance of corpus data, corpora cannot be used as the only source of linguistic judgments. In fact, introspection is crucially necessary as an additional source of data, since corpora do not provide negative evidence, neither do they reveal whether missing evidence is missing due to complete impossibility or simply because it is missing from the studied sample or a particular corpus. This is to say that, from the very beginning of this work, I was well aware of the fact that corpus evidence might not provide each and every pattern possible for a target verb, yet I have taken advantage of the availability of a large electronic corpus to provide me with a huge number of evidence that could not have emerged from introspection or native speaker intuition alone. Thus, as defended by Fillmore (1992, p. 35), the present linguistic investigation in fact combines both methodologies in one body:

I don't think there can be any corpora, however large, that contain information about all the areas of English lexicon and grammar that I want to explore; all that I have seen are inadequate. [Yet] every corpus I've had the chance to examine, however small, has taught me facts I couldn't imagine finding out about in any other way. My conclusion is that the two types of linguistics need one another. Or better, that the two kinds of linguistics, wherever possible, should exist in the same body.

Chapter 5

CASE STUDY 1, *CONGELAR*

This chapter presents a case study of the verb *congelar* ‘freeze’ in composition. The main argument made here is that what has essentially been considered meaning shifts of verbs can receive an analysis that helps to avoid postulating several homophonous lexical entries. Instead, I tackle apparent meaning shifts, as illustrated in (1) and (2), as a question of composition and provide an analysis that strongly involves the semantics of the theme argument.

- (1) La posibilidad de congelar el semen humano para su uso posterior
the possibility of freezing the semen human for its use posterior
se descubrió en 1949.
REFL discovered in 1949
‘The possibility of freezing human semen for later use was discovered in 1949.’ [*El País Corpus*]
- (2) A la vista de estos resultados, el consejo de administración de
to the sight of these results the council of administration of
Fosbuicrá decide congelar sus actividades.
Fosbuicrá decides freeze its activities
‘In light of these results, the board of directors of Fosbuicrá decides to freeze its activities.’ [*El País Corpus*]

Examples (1) and (2) show that whether *congelar* selects for a substance like *semen* ‘semen’ or an action noun like *actividad* ‘activity’ makes a crucial difference as to what kind of event *congelar* ends up describing. In the first case an event is described where a liquid substance acquires a solid state by applying low temperature. In the second case, the event describes the cessation of an ongoing activity.

The semantics of the theme is not only important for determining the meaning of verb phrases, but it also influences the possibilities of syntactic realisation of a *congelar* verb phrase. The contrast between the b)-examples in (3) and (4)

illustrates that for the choice of theme *ayuda* ‘help’ the anticausative variant is not possible.

- (3) a. El frigorífico congeló la hamburguesa.
the fridge froze the hamburger
‘The fridge froze the hamburger.’
b. La hamburguesa se congeló.
the hamburger REFL froze
‘The hamburger froze.’
- (4) a. El rey Hussein congeló la ayuda económica prometida a
the King Hussein froze the help economic promised to
municipios controlados por la OPL.
municipals controlled by the PLO
‘King Hussein froze the economic help promised to municipalities
controlled by the PLO.’ [*El País Corpus*]
b. #La ayuda se congeló por sí sola.
the help REFL froze by self alone
‘The help froze by itself.’

Even more, the semantics of the theme contributes to establishing the aspectual properties of the verb phrase, as illustrated by the difference in the possibility of adding the periphrasis *terminó de* ‘finished + gerund’ to examples (5) and (6). The periphrasis *terminó de* crucially requires telicity as well as duration. In this way it is shown that only in example (5) do we get the reading of the finishing of some durative goal-oriented event. In (6), in turn, the modification is not licensed, since the event described is not durative. This difference thus illustrates that some *congelar* verb phrases can be durative while others cannot.

- (5) El congelador terminó de congelar la hamburguesa.
the freezer finished of freeze the hamburger
‘The freezer finished freezing the hamburger.’
- (6) #Rabat terminó de congelar la ratificación del acuerdo pesquero.
Rabat finished of freeze the ratification of the agreement fishing.ADJ
‘Rabat finished freezing the ratification of the fishing agreement.’

Summing up, examples (1) through (6) illustrate that the choice of theme determines the sort of *congelar* event described with consequences that are manifested in the possible syntactic realisations and in the aspectual behaviour.

The chapter is structured as follows. In section 5.1 I present the kind of themes *congelar* combines with according to corpus data. This exploration leads to some generalisation about these kinds of themes. In section 5.2 I present the semantico-syntactic groupings that have emerged from the observation of corpus data. The

crucial insight of this subsection is that the kind of theme *congelar* combines with has an influence on the verb's possible syntactic realisations. The semantico-syntactic dependencies between the kind of theme and the restrictions on syntactic realisation then receive a formalisation within the framework of Modern Type Theories in section 5.3. Finally, in 5.4 I also provide a formal analysis of how the theme contributes to the computation of the scalar structure of *congelar* verb phrases.

Exploring all these aspects together, I illustrate how the meaning of a verb phrase is contingent on the arguments the verb takes. This view of meaning shifts, which involves the verb and its arguments, avoids resorting to a Sense Enumeration Lexicon account and thus departs from a model of the lexicon that accounts for the phenomenon of meaning shifts by listing distinct meanings.

5.1 Typical theme arguments of *congelar* and their effect on verb phrase meaning

In this section I provide a descriptive grouping of the kinds of themes *congelar* takes according to corpus data. I examine the most frequent and most representative themes that *congelar* combines with. Broadly, I distinguish two main groups of arguments, namely physical substances and eventualities. However, before discussing the different subgroups of arguments, I make a short digression to the challenge posed by the necessity of classifying a great diversity of abstract nouns that I encountered in the corpus as themes of CoS verbs.

As a matter of fact, all three verbs that I have analysed throughout this study most frequently select for abstract themes. As I discuss later, the percentages of distinct nouns may vary across corpora, yet, from a qualitative perspective, the observation that this combinatorial behaviour is regular is crucial. To provide an analysis of this behaviour it was important to gain a better understanding of the nature of these abstract nouns. In this respect, a crucial insight of the present study is that the vast majority of abstract nouns that CoS verbs combine with denotes distinct kinds of eventualities. To give an example, as a typical theme argument of *congelar* I found *relaciones* 'relations'.

- (7) [...] España congele sus relaciones con Rabat [...]
 Spain freeze.SBJV its relations with Rabat
 'that Spain will freeze its relations with Rabat' [*El País Corpus*]

This noun can be submitted to a series of eventuality tests, as I illustrate below.

- (8) Las relaciones tuvieron lugar.
 the relations took place

‘Relations took place.’

- (9) España empezó relaciones con Rabat.
Spain started relations with Rabat
‘Spain established relations with Rabat.’
- (10) Las relaciones entre España y Rabat se vieron interrumpidas.
the relations between Spain and Rabat REFL see.2PL interrupted.
‘The relations between Spain and Rabat were disrupted.’

These and other tests, known from the literature (Mourelatos, 1978; Resnik, 2011), were run for the different abstract nouns encountered in corpus to find out whether they effectively pattern with eventualities. Nevertheless, as for the purpose of the present study, these tests turned out to be helpful only to a certain extent. As I will discuss in more detail below, many entities CoS verbs combine with are understood as eventualities in which these entities are involved in some way. In other words, they are coerced into events. This fact, however, lies outside the scope of these tests. Even more importantly, these tests do not provide concrete semantic information about the distinct kind of eventualities, such as differences between states, events, processes or actions. Such kind of classification, however, seemed necessary to approach the great variety of abstract nouns in a bottom-up corpus study. Consequently, the classifications of the different abstract nouns that I provide below were mainly guided by the semantic effects the distinct kinds of themes seem to have on the overall verb phrase meaning. The boundaries established between the distinct classes of eventualities are admittedly fuzzy and should not be extrapolated to other verbs, since precisely one of the basic insights of the corpus study has been that the relevant groupings of nouns are related to the verb they combine with.¹ Nevertheless, these groupings turned out to be useful to understand what is going on semantically when the distinct CoS verbs combine with abstract nouns. Here I start with *congelar*. An informal classification suggests a crucial property that affects all eventuality-type themes that *congelar* combines with is ‘movement’. There is no doubt that more profound research on the abstract nouns found throughout this study in the corpus is necessary, but a detailed study of abstract nouns lies outside the scope of the current dissertation and must be left for future research.

Corpus evidence shows that *congelar* basically combines with two kinds of themes, namely physical objects and eventualities. The list of possible themes of *congelar* according to the overall frequency with which they appear in the corpus is the following: 1) eventualities, including several cases of nouns that are coerced into being understood as eventualities, even though they basically denote amounts, states, moving images and human groups, and 2) physical objects, in-

¹See Hanks and Jezek (2008) for a similar insight grounded in the work on corpus data.

cluding substances, food items and body parts. Important semantic differences arise with respect to the different kinds of theme arguments *congelar* combines with.

Starting with the more obvious physical domain, *congelar* selects for distinct kinds of substances including all kinds of liquids and physical objects, as the following corpus examples show. ‘Substance’ has been chosen as a hypernym for this group, given that physical objects undergo freezing in as far as the liquids they contain become immobile.

- (11) La posibilidad de congelar el semen humano para su uso posterior
the possibility of freezing the semen human for its use posterior
se descubrió en 1949.
REFL discovered in 1949
‘The possibility of freezing human semen for later use was discovered in 1949.’ [*El País Corpus*]
- (12) Una temperatura tan baja congela inmediatamente el tumor.
a temperature so low freezes immediately the tumour
‘Such a low temperature immediately freezes the tumour.’
[*El País Corpus*]
- (13) [...] lo que realmente sucede es que el vapor de agua se
that which really happens is that the vapour of water REFL
combina con el dióxido de carbono y se congela en la
combine with the dioxide of carbon and REFL freeze in the
superficie
surface
‘What happens in reality is that the water vapour combines with the carbon dioxide and freezes.’ [*El País Corpus*]

These combinations are grouped under the pattern [[CAUSE]] congelar [[SUBSTANCE]]. In these uses *congelar* describes a process of submission of a substance or solid body to very low temperature. As a result of the accomplishment of the event the liquid acquires a solid state. For solid bodies freezing affects the liquid they contain.

The class of substances also includes cases where a container stands in for the liquid contained by it, as illustrated in example (14).

- (14) El congelador ha congelado la botella.
the freezer has frozen the bottle
‘The freezer has frozen the bottle.’

Given that the data proceeds from a press corpus, the combination of *congelar*

with substances is rather infrequent, representing only about 3% of the annotated data. In the face of a qualitative study, however, and considering that this is the most explored combination in previous literature, these data are understood to be sufficient to instantiate the physical use of *congelar*.

Schematically, when substances undergo freezing the affected part is the liquid that turns solid:

- (15) *congelar* + [substance]
Affected property: liquid becomes solid

Congelar most frequently combines with eventuality denoting themes. This combination represents 96% of the annotated corpus examples. It is worth considering at this point that due to the fact that I have used a press corpus this percentage might fall lower, if more oral fonts were included. Nevertheless, as I discussed in chapter 4, this corpus is considered to be a representative sample of the general Spanish language. It is for this reason that I assume that, despite a possible shift in percentages, the combination with eventuality themes vastly outnumbers the physical use.

The uses of *congelar* in composition with eventuality denoting themes have been annotated under the pattern [[CAUSE]] *congelar* [[EVENTUALITY]]. This pattern includes three sub-kinds of theme arguments that I take to represent direct instantiations of eventualities, namely processes [[Process]], accomplishment events [[Event]] and states [[State]]. In the eventuality class of themes, I have also included a range of entities that are understood as eventualities, when combined with *congelar*. These are all kinds of amounts, [[Amount]], entities and artefacts, [[Artefact]], human groups, [[Group]], and moving images, [[Image]]. Throughout the descriptive listing of themes I will explain this decision in more detail.

Certainly the most representative examples are processes performed or controlled by agents which I have grouped under the pattern [[Human | Group]] *congelar* [[Process]]. In these cases *congelar* denotes a temporal paralysation of an ongoing process controlled by an agent, as illustrated in examples (16) and (17).

- (16) Pekín ha decidido congelar su cooperación nuclear y militar con
Beijing has decided freeze its cooperation nuclear and military with
Irán.
Iran
'Beijing has decided to freeze its nuclear and military cooperation with
Iran.' [*El País Corpus*]
- (17) El presidente de Panamá se compromete [...] a congelar el
the president of Panama REFL commits to freeze the

contencioso entre Norteamérica y Panamá.
 confrontation between North America and Panama
 ‘The president of Panama commits to temporarily ending the confrontation between the USA and Panama.’ [*El País Corpus*]

Interestingly, many of the processes-describing nominals that *congelar* selects as its themes appear in plural, which conveys an iterative reading and provides an idea of dynamism, as illustrated in examples (18), (19) and (20).

- (18) El CDS congeló estas conversaciones.
 the Centre Democratic and Social froze these conversations
 ‘The CDS party froze these conversations.’ [*El País Corpus*]
- (19) La alcaldía de Sevilla congeló las negociaciones.
 the mayor’s office of Seville froze the negotiations
 ‘The mayor’s office of Seville froze the negotiations.’ [*El País Corpus*]
- (20) El Gobierno norteamericano estaría dispuesto a congelar sus relaciones con la dictadura militar chilena.
 the government North American would be willing to freeze its relations with the dictatorship military Chilean
 ‘The American Government would be willing to freeze its relations with the military dictatorship in Chile.’ [*El País Corpus*]

Schematically the following generalisation with respect to a process affected by *congelar* can be provided:

- (21) *congelar* + [process]
 Affected property: the ongoing of the process

Within the class of eventualities, the second group of themes that typically combine with *congelar* are goal-oriented events. These corpus examples were annotated under the pattern [[Human | Group]] congelar [[Event]] as an instantiation of [[CAUSE]] congelar [[EVENTUALITY]].

For instance, the providing of official help in (22) as well as the ordering of planes in (23) describe some kind of dynamic processes that develop towards a final goal.

- (22) El rey Hussein congeló la ayuda económica prometida a municipios controlados por la OPL.
 the King Hussein froze the help economic promised to municipals controlled by the PLO
 ‘King Hussein froze the economic help promised to cities controlled by the PLO.’ [*El País Corpus*]

- (23) Estados Unidos [...] últimamente congeló un nuevo pedido de aviones
 States United lately froze a new demand of planes
 y helicópteros por valor de cien millones de dólares, hecho por
 and helicopters of value of hundred millions of dollars, made by
 el Gobierno marroquí.
 the Government Moroccan
 ‘The United States recently froze a new order of planes and helicopters
 valued at one hundred million dollars, made by the Government of Mo-
 rocco.’ [*El País Corpus*]

What seems to be crucial is that there is some presupposed change that is prevented for a certain amount of time by freezing. This is exactly what happens in the case of combining *ratificación* ‘ratification’ with *congelar* in example (24).

- (24) Rabat congeló la ratificación del acuerdo pesquero.
 Rabat froze the ratification of the agreement fishing
 ‘Rabat froze the ratification of the fishing agreement.’ [*El País Corpus*]

Similarly, *convocatoria* in (25) receives the interpretation of a planned event, which is blocked up for a certain amount of time.

- (25) El PSOE congeló la convocatoria de nuevas oposiciones.
 the PSOE froze the call of new public exams
 ‘The Spanish Socialist Party froze the call for new public exams.’
 [*El País Corpus*]

Schematically, the way *congelar* affects goal-oriented events is that it prevents some expected change from occurring and thus the reaching of the goal.

- (26) *congelar* + [goal-oriented event]
 Affected property: expected realisation of the event

Further, themes that denote states are also common in composition with *congelar*. These were collected under the pattern [[Cause]] congelar [[State]]. Particularly frequent is the theme *situación* ‘situation’, as in examples (27) and (28). In these cases the event describes the preventing of any possible change in a particular situation.

- (27) La postura del comité de empresa pretende frenar o congelar
 the position of the committee of company pretends brake or freeze
 la situación de pluses y horas extras.
 the situation of pluses and hours extra
 ‘The position of the works council intends to slow or stop expansion of

the bonuses and overtime system.’ [El País Corpus]

- (28) El Gobierno británico anunció que rechazaría toda propuesta de
the Government British announced that rejects all suggestion of
EEUU orientada a congelar la situación de las Malvinas
U.S. oriented toward freeze the situation of the Falkland Islands
a su estado natural, es decir, presencia sin refuerzo de las
to its state natural is say presence without reinforcement of the
tropas argentinas, mientras se preparen negociaciones.
troops Argentinian while REFL prepare negotiations
‘The British Government announced that it rejects all proposals by the
U.S. oriented towards freezing the situation of the Falkland Islands in its
natural state, this is to say, the unreinforced presence of the Argentinian
troops, while negotiations are prepared.’ [El Corpus del Español]

The class of state nouns also includes a vast variety of themes that stand in for a certain state of things, as is the case of *estructura multiforme de precios* ‘diverse structure of prices’ in example (29). In these cases, *congelar* hinders an expected development of the present situation.

- (29) La Organización de Países Exportadores de Petróleo (OPEP)
the Organisation of Countries Exporting of Petroleum (OPEC)
decidió anoche en Ginebra congelar la estructura multiforme de
decided last night in Geneva freeze the structure multiform of
precios del consorcio hasta finales de año.
prices of the consortium until the end of year
‘The Organisation of Petroleum Exporting Countries decided last night
in Geneva to freeze the diverse structure of prices of the consortium until
the end of the year.’ [El Corpus del Español]

Thus, schematically, the way *congelar* affects states is that it prevents any change in the currently holding state. Here again, the underlying idea is that there might be some predictable change in the existing situation or state.

- (30) *congelar* + [state]
Affected property: expected change in the temporal progress of the state

Apart from the events, processes and states, there is a whole range of entities that combine with *congelar* by virtue of being understood as eventualities. That is the case for the group of themes that denote numerical values, which I have annotated under the pattern [[Human | Act | Artefact | Event | State]] *congelar* [[Amount]]. This pattern represents a use of the superpattern [[CAUSE]] *congelar* [[EVENTUALITY]] in as far as the interpretation of eventuality applies to entities. In

the process of composition, then, an additional operation of coercion is required where a noun that describes an amount is actually understood as a state defined by a certain value. Mainly these themes are financial entities making reference to funds, salaries or prices as well as all kinds of quantities. *Congelar* in these cases describes an event of freezing the expected increase or decrease of an amount, as illustrated in (31) through (34).

- (31) La última reunión realizada en Viena en septiembre de 1975 congeló
 the last meeting realised in Vienna in September of 1975 froze
 las tarifas actuales del petróleo.
 the prices current of the petrol
 ‘The last meeting that took place in Vienna in September 1975 froze current petrol prices.’ [*El País Corpus*]
- (32) Las propuestas del Gobierno congelan en la cifra de este año
 the proposals of the Government freeze in the number of this year
 los fondos para subsidio de desempleo [...].
 the funds for subsidy of unemployment
 ‘The proposals by the Government freeze the funds destined for unemployment compensation at this year’s level.’ [*El País Corpus*]
- (33) La comisión de la UE quiere congelar las cuotas de CO₂.
 the commission of the EU wants freeze the rates of CO₂
 ‘The commission of the European Union wants to freeze the permitted amount of CO₂ emissions.’ [*El País Corpus*]
- (34) Se congela la cuantía de las pensiones vitalicias de ex ministros
 REFL freeze the quantity of the pensions life.ADJ of ex ministers
 y cargos asimilados para 1981.
 and responsibilities assimilate for 1981
 ‘The amount of life pensions of ex ministers and similar posts is frozen for 1981.’ [*El País Corpus*]

In these cases an amount is understood in terms of a process of increase or decrease and this is the reason why I included it as a sub-type of eventuality. Thus, schematically, the way *congelar* affects numerical values is that it prevents a change in value expected for this numerical value denoted by the theme:

- (35) *congelar* + [numerical value]
 Affected property: expected change in value

The corpus, however, also provides many ambiguous examples, which allow for several readings simultaneously. Thus example (36) allows both for a reading that refers to a change in the numerical value *armas nucleares* ‘nuclear arms’ as well as

a process reading associated with the production of nuclear arms. This is made explicit by the two adverbs *cuantitativamente* ‘quantitatively’ and *cualitativamente* ‘qualitatively’.

- (36) Brezhnev pide una moratoria para congelar cuantitativa y
Brezhnev asks for a moratorium for freeze quantitatively and
cualitativamente las armas nucleares de alcance medio.
qualitatively the arms nuclear of range middle
‘Brezhnev demands a moratorium on the quantitative and qualitative freez-
ing of mid-range nuclear arms.’ [*El País Corpus*]

Even more complicated is the interpretation of (37), where it is not made clear whether *exportaciones* ‘exports’ refer to the ceasing of the action of exporting or rather to the freezing of increases in the amount of products exported.

- (37) La CEE quiere que España congele sus exportaciones textiles.
the EEC wants that Spain freezes its exports textile
‘The European Economic Union wants Spain to freeze its textile exports.’
[*El País Corpus*]

Ambiguities between process and amount readings are quite common for themes taken by *congelar*. Context is crucial in disambiguating these cases, though not all cases are clearly solvable with its help. The corpus thus illustrates how complex the panorama of predication is when considering data in use.

Further, I have included a series of artefacts in the eventualities class, which in composition with *congelar* are not affected physically as solid entities, but rather understood as processes that involve these entities. A common example of this subgroup comes from the sports press that describes an event where football players try to control the ball without running any risk. What it expresses in this way is that the players interrupt a dynamic process such as a game.

- (38) En los últimos minutos del partido ambos equipos decidieron
in the last minutes of the play both teams decided
congelar el balón y renunciaron al ataque.
freeze the ball and renounced to the attack
‘In the last minutes of the game both teams decided not to play and re-
fused to attack.’ [*El País Corpus*]

These kinds of semantic exploitations are understood as coercions, which generally involve shifts from a predication about an argument that is not an eventuality to a predication involving an argument of eventuality type (Pustejovsky, 1995; Asher, 2011). This phenomenon seems to be very widespread among change of state verbs in general.

The same kind of coercion occurs with objects like ‘nuclear arms’, standing in for a process related to that object, as in example (39). In this case the context helps determine what kind of process the object stands in for. This example is very similar to example (36), although there is no ambiguity here. In the case of (39) the context indicates that the object *armas nucleares* ‘nuclear arms’ stands for the investment in the production of nuclear arms and not the process of physically freezing the nuclear arms.

- (39) [...] miles de ciudadanos han expresado su deseo de que se
 thousands of citizens have expressed their desire of that REFL
 congelen las armas nucleares y se transfieran esos fondos a
 freeze the arms nuclear and REFL transfer those funds to
 paliar las necesidades humanas.
 mitigate the necessities human
 ‘Thousands of citizens have expressed their desire to freeze spending
 on nuclear arms and to transfer those funds to addressing humanitarian
 needs.’
[El País Corpus]

Another case that illustrates the same kind of metonymic interpretation is when *congelar* applies to ‘accounts’, which has as an effect the blocking of any possible operation on the accounts. In this case the ‘accounts’ stand in for an operation performed on these accounts.

- (40) Los jueces milaneses congelaron las cuentas bancarias de los
 the judges Milanese froze the accounts bank.ADJ of the
 familiares de las víctimas.
 relatives of the victims
 ‘The judges in Milan froze the bank accounts of the relatives of the vic-
 tims.’ *[El País Corpus]*

In fact, these cases are in a way reminiscent of examples like the one mentioned in the bottle example in (14) in that a particular object stands in for what actually freezes. In the case of containers, it is the liquid and in the case of artefacts or accounts, it is the action performed on them. The case of artefacts standing in for actions and processes related to the artefact have been annotated under [[Human]] *congelar* [[Artefact]] and represent a kind of exploitation of the pattern [[CAUSE]] *congelar* [[EVENTUALITY]].

- (41) *congelar* + [artefact]
 Affected property: related process or event

Another pattern that includes entries understood as eventualities was collected in the pattern [[Group | se²]] congelar [[Group]]. This pattern represents predominantly an anticausative use of *romper*, which represents a restriction of argument realisation that I treat in the following subsection. What is important here is that *congelar* appears in this pattern in composition with groups, as in example (42). These groups are mainly characterised by some kind of social or political idea that is susceptible to further development. This is the reason these nouns not only refer to groups, but rather can be understood as a kind of ideological movement.

- (42) Para que este Buró Político siga gobernando es preciso que toda
 for that this Bureau Political keeps governing is necessary that all
 la sociedad soviética se congele a su vez.
 the society Soviet REFL freeze.SBJV. in its turn
 ‘In order for the Politburo to keep on governing it is necessary for the
 whole Soviet society to stop developing.’ [*El País Corpus*]

To the same group belong examples where the theme directly denotes an ideological movement, such as in example (43). In this case *congelar* prevents the set of ideas characterising socialism from developing any further.

- (43) El socialismo se congela.
 the socialism REFL freezes
 ‘Socialism is freezing.’

The composition of *congelar* with groups comes down to an interpretation of the group as an ideological movement. What is frozen is the possible change or evolution an ideological group is susceptible to.

- (44) *congelar* + [groups]
 Affected property: ideological movement

Finally, yet another subpattern understood as standing in for an event is represented by [[Human | Instrument]] congelar [[Image]]. In this case *congelar* takes a series of images as its argument. These *congelar* events describe the pausing of a series of moving images in one particular still. Thus the composition of *congelar* with moving pictures represents yet another case of an object that receives the interpretation of a process performed on this object.

- (45) [...] otra cosa es congelar esos fotogramas, y hacerme aparecer
 other thing is freeze these stills and make me appear
 desnuda, así, sin más.
 naked so without more

²‘Se’ is the third person reflexive pronoun used in the anticausative pattern.

‘It’s an entirely different matter if you freeze those stills and just show me naked, with no further explanation.’ [*El País Corpus*]

- (46) Los sincronizadores congelan automáticamente la última imagen
the synchronisers freeze automatically the last image
recibida, que era en aquel instante la imagen del Rey de España.
received which was in that instant an image of the King of Spain
‘The synchronisers automatically freeze the last image they receive, which
in that moment was an image of the King of Spain.’ [*El País Corpus*]

Schematically, we can say that *congelar* affects the ongoing movement in the case of movies and images.

- (47) *congelar* + [image]
Affected property: ongoing movement of a set of images

It is important to emphasise here, as has been done by Asher (2011), that the event interpretation should not be taken to be part of the meaning of the nouns that denote amounts, artefacts, groups or images. Taking this step would bring about overgeneralisations. For example, understanding an artefact like *balón* ‘ball’ as lexically encoding an event would lead to some incorrect predictions that affect argument realisation possibilities of *congelar*. As I will discuss below, *congelar* in composition with eventuality-denoting themes allows for the anticausative alternation, which however cannot be the case for a VP with *balón*, as the following example illustrates.

- (48) #El balón se congeló.
the ball REFL froze
Intended: ‘The game in which the ball was involved froze.’

This example illustrates that the event interpretation should not always be available for *balón*, which indeed shows that the event reading is not part of the lexical meaning of *balón*. Comparing example (48) to example (49) illustrates further that coercion does not occur across all possible syntactic configurations.³ The observation that coercion has more restricted syntactic realisations will be elaborated on in section 5.3.

- (49) [...] el Madrid congeló el balón.
the Madrid froze the ball
‘Madrid froze the ball.’ [*El País Corpus*]

Summing up, it can be said that *congelar* has the capacity to combine with sub-

³See Asher (2011, p. 217) for a related observation.

stances and eventualities of distinct kinds, the latter of which include cases of coerced events. All of the themes that combine with *congelar* refer either to some dynamic action or to an event with an expected goal. In general, processes transmit more the idea of dynamism while events cause a goal to be envisaged. The way *congelar* affects all those kinds of themes is that it either interrupts the temporal development of a process, or it prevents the completion of an event, or even prevents any possible change in a state.

What seems to stand out in all the cases of arguments I have elaborated on is that the theme arguments *congelar* selects for can intuitively be associated with some kind of movement, which is conceived of precisely in terms of change and dynamism. By undergoing the event of freezing, this kind of movement is paralysed to a particular situation. It thus becomes clear that, despite the fact that *congelar* selects for several apparently distinct kinds of themes, these theme arguments are easily comprised under the semantic notion of ‘motion’.

The idea of movement that ends up in an immobile state lends itself very well to an aspectual analysis of change, which will be provided in section 5.4.3. Before that, however, I will illustrate which syntactic realisation patterns are possible for the different kinds of theme arguments of *congelar*, as well as how we possibly could account compositionally for the different restrictions.

5.2 Syntactico-semantic alternations with *congelar*

Corpus data reveal that *congelar* can be found in the causative-anticausative alternation with some themes but not with others, which I take as indirect evidence for two patterns: 1) a transitive causative pattern, which allows for an causative-anticausative alternation, and 2) an exclusively transitive pattern that precludes the alternation. Each of these syntactic realisation patterns contains several semantic clusters corresponding to the CPA+R patterns annotated in the corpus, which describe different kinds of *congelar*-events. The differences and semantico-syntactic interdependencies will become clear as I proceed with the analysis.

5.2.1 The causative-anticausative alternation

Congelar as a member of the change of state verb class typically appears in the causative-anticausative alternation. In the causative variant, the change event can be caused externally by distinct causers ranging from agents, natural causes and events to instruments, as shown in example (50).

- (50) El técnico del laboratorio/ una temperatura tan baja/ la reacción
 the technician of the laboratory/ a temperature so low/ the reaction
 química/ el congelador congeló el agua.
 chemical/ the freezer froze the water
 ‘The lab assistant/ a very low temperature/ the chemical reaction/ the
 freezer froze the water.’

The corresponding anticausative variant describes an event which arises from within the affected entity. This variant has a reflexive clitic *se* on the verb. Yet in both patterns of the the causative-anticausative alternation no particular information is given concerning how the entity denoted by the corresponding subject brings about the event (Van Voorst, 1995). Thus freezing can be brought about in a wide variety of ways, as becomes clear in example (51).

- (51) El agua se congeló por el viento gélido/ por una
 the water REFL froze through the wind iced/ through a
 reacción química/ por arte de magia.
 reaction chemical/ through art of magic
 ‘The water froze due to the freezing wind/ due to a chemical reaction/
 due to magic.’

As I will illustrate in this section, the causative-anticausative alternation is regular for a range of themes that *congelar* combines with. *Congelar* basically appears in the causative-anticausative alternation for all kinds of liquids, substances and physical objects, as the following examples illustrate.

- (52) a. La bajas temperaturas de los últimos días han congelado el Mar
 the low temperatures of the last days have frozen the Sea
 Negro.
 Black
 ‘The low temperatures of the last days have frozen the Black Sea.’
 b. El Mar Negro se ha congelado.
 the Sea Black REFL has frozen
 ‘The Black Sea has frozen.’
- (53) a. El frigorífico ha congelado la botella/ la hamburguesa.
 the freezer has frozen the bottle/ the hamburger
 ‘The freezer has frozen the bottle/ the hamburger.’
 b. La botella/ la hamburguesa se ha congelado.
 the bottle/ the hamburger REFL has frozen
 ‘The bottle/ the hamburger has frozen.’

This causative-anticausative alternation is also regular for all kinds of groups, as illustrated in (54).

- (54) a. La liberalización de los mercados congela el socialismo.
the liberalisation of the markets freezes the socialism
'The deregulation of markets weakens socialism.'
b. El socialismo se congela.
the socialism REFL freezes
'Socialism is on the decline.' [*El País Corpus*]

The causative-anticausative alternation also appears in cases when *congelar* combines with process denoting themes, as in example (55).

- (55) En 1976 la crisis económica señorea el mundo, se congelan los
in 1976 the crisis economic controls the world REFL freeze the
procesos de cambio [...]
processes of change
'In 1976, the world was in the grips of an economic crisis, and processes
of change were grinding to a halt.' [*El País Corpus*]

A case in between the group case and the process reading seems to be when groups are denoted by some collective action, as in (56).

- (56) Se congela el murmullo en la gruta.
REFL freezes the murmur in the grotto
'The murmur in the grotto stops.' [*El País Corpus*]

Going beyond the examples laid out here, according to the theoretical generalisations for the class of causative change of state verbs discussed in chapter 3, *congelar* is actually expected to regularly appear in the causative-anticausative alternation (Levin, 1993). Reflexion on the corpus data attested for *congelar*, however, leads to the insight that an immense number of transitive uses of *congelar* do not allow for an anticausative counterpart, as I illustrate in the following section. These apparent exceptions have very concrete semantic restrictions.

5.2.2 The agentive pattern

The following examples illustrate that not all *congelar*-sentences can undergo de-causativisation. Some of the *congelar* verb phrases actually are consistently agentive. As I show in this section, this restriction on the subject is related to the choice of the theme argument.

- (57) a. El rey Hussein congeló la ayuda económica prometida a
the King Hussein froze the help economic promised to
municipios controlados por la OPL.
municipals controlled by the PLO
‘King Hussein froze the economic help promised to cities controlled
by the PLO.’ [*El País Corpus*]
- b. #La ayuda se congeló por sí sola.
the help froze by self alone
‘The help froze by itself.’
- (58) a. La comisión de la UE quiere congelar las cuotas de CO₂.
the commission of the EU wants freeze the rates of CO₂
‘The commission of the European Union wants to freeze CO₂ Quotes.’
[*El País Corpus*]
- b. #Las cuotas de CO₂ se congelan por sí solas.
the rates of CO₂ REFL freeze by self alone
‘The CO₂ Quotes freeze by themselves.’

The lack of the anticausative variant of some change of state verbs has been attributed to the fact that certain verbs are inherently agentive and therefore lexically specify for two arguments (Levin and Rappaport Hovav, 1995; Rappaport Hovav and Levin, 2012; Horvath and Siloni, 2011). However, this claim applied to the verb *congelar* ‘freeze’ would be an overgeneralisation in the face of the data in the preceding subsection, where certain *congelar*-sentences have proven to be cause-underspecified by not restricting for any particular kind of thematic role for the subject argument. An alternative explanation, which I will pursue below, is related to the choice of the theme.

I claim that certain themes, due to their semantic identity in composition with *congelar*, build verb phrases that subcategorise for agent-subjects and even more restrictively agents that refer to authorities. Such a concrete specification for an agent prevents the verb from denoting an event that can take place without the intervention of an agent, as pointed out by Mendikoetxea (1999) for break-type verbs. This explains why an agent-specified subject cannot simply be suppressed.

In the case of *congelar*, the restriction to human agents is correlated with artefacts or amounts in object position, as illustrated in (59) and (60);); both stand in for events. Here again, it is necessary to add the idiomatic anaphor *por sí solo/a* in the following examples to construe the subject of the anticausative as the sole cause and thus identify the cause and the theme as one unique argument (Chierchia, 2004).

- (59) a. [...] el Madrid congeló el balón.
the Madrid froze the ball

- ‘Madrid refused to play.’ [*El País Corpus*]
- b. #La balón se congeló por sí sola.
the ball REFL froze by self alone
‘The ball froze by itself.’
- (60) a. Arabia Saudí congela en 32 dólares el precio de su barril.
Saudi Arabia freezes in 32 dollars the price of its barrel
‘Saudi Arabia freezes the price of the barrel at 32 dollars.’
[*El País Corpus*]
- b. #El precio del barril se congela en 32 dólares por sí solo.
the price of the barrel REFL freezes in 32 dollars by self alone
‘The price of the barrel freezes at 32 dollars by itself.’

The alternation is also restricted for the domain of event-denoting themes. Unlike the CoS verbs *cortar* and *romper*, which will be considered in the following chapters, *congelar* in composition with eventuality-describing themes hardly ever allows for the anticausative pattern. This fact is illustrated through a small selection of corpus examples.

- (61) a. Carter congeló sus relaciones diplomáticas con Moscú.
Carter froze his relations diplomatic with Moscow
‘Carter froze his diplomatic relations with Moscow.’
[*El País Corpus*]
- b. #Sus relaciones diplomáticas con Moscú se congelaron por
his relations diplomatic with Moscow REFL froze by
sí solas.
self alone.PL
‘His diplomatic relations with Moscow froze by themselves.’
- (62) a. Rabat congeló la ratificación del acuerdo pesquero.
Rabat froze the ratification of the agreement fishing
‘Rabat froze the ratification of the fishing agreement.’
[*El País Corpus*]
- b. #La ratificación del acuerdo pesquero se congeló por sí
the ratification of the agreement fishing REFL froze by self
sóla.
alone
‘The ratification of the fishing agreement froze by itself.’
- (63) a. Los planes socialistas referentes a la OTAN en estos momentos
the plans Socialist referring to the NATO in these moments
congelan el proceso de integración de España.
freeze the process of integration of Spain
‘Regarding NATO, current Socialist plans freeze Spain’s entry pro-

cess.’ [El País Corpus]

- b. ??El proceso de integración de España se congela por sí solo.
the process of integration of Spain REFL freezes by self alone
‘Spain’s entry process freezes itself.’

Furthermore, the anticausative form is precluded in composition with state-denoting themes, as the following example from above illustrates:

- (64) a. La postura del comité de empresa pretende frenar o
the position of the committee of company pretends brake or
congelar la situación de pluses y horas extras.
freeze the situation of pluses and hours extra
‘The position of the works council intends to slow or stop expansion
of the bonuses and overtime system.’ [El País Corpus]
- b. #La situación de pluses y horas extras se congela por sí
the situation of pluses and hours extra REFL freeze by self
sola.
alone
‘The expansion of the bonuses and overtime system stopped by it-
self.’

These data demonstrate that *congelar* in composition with artefacts, amounts, eventualities in general and states forms verb phrases that subcategorise for agents. The argument that could be put forward facing these data is that these verb phrases with *congelar* do quite concretely indicate what the entity given by the subject has to do in order to bring about the event. In fact, the relevant observation can be made even more precise. The events *congelar* describes in most of these sentences cannot even be realised by a simple agent to cause the event, but rather require some kind of authority such as Saudi Arabia, President Carter, a government represented by its capital ‘Rabat’ or a political party like the Spanish Socialists. This is due to the fact that semantically the kinds of themes *congelar* combines with in these cases are actions and processes that essentially belong to the world of human commercial interactions and institutional relations which require the control of the process by an authority. Thus *congelar* verb phrases that describe the interruption of an ongoing social or political process, or prevent any action on a commercial entity such as accounts or prices, restrict for authorities because only they have the capacity to intervene in such events. Consequently, the anticausative pattern, which describes an event that proceeds outside the realm of influence of the instigator, is not licensed for such kinds of verb phrases.

Similar observations concerning object-subject interdependencies have been acknowledged for other verbs by Rappaport Hovav and Levin (2012) and explained by the necessity of direct causation for certain events. Yet, acknowledging

these fine-grained distinctions that predication is sensitive to, many analyses opt for postulating several lexical entries for one and the same verb, which in turn forces a sense enumerative model of the lexicon. In this study, however, rather than following this path, I explore a different way of implementing the present data observation. The approach that I assume throughout this work is based on the idea that fine-grained types allow us to master much more fine-grained selectional restrictions of the verb. This approach renders unnecessary the postulation of various lexical entries. Paying attention to these very fine-grained restrictions in turn allows us to treat fine morphosyntactic idiosyncrasies as well as semantic restrictions on the external argument. As discussed in chapter 2, all these phenomena are handled through a typing suggestion within Modern Type Theories, as will be illustrated in the following section.

5.3 Composing *congelar*-VPs with physical objects and events

As explained in chapter 2, the fact that *congelar* can combine with very diverse kinds of themes represents a clear problem for a Montagovian system of composition, since the simple type system does not offer a transparent account of how the semantics of the argument can influence the semantics of the resulting predication. The data facts described above thus call for a compositional model that allows for a wide range of fine-grained types which reflect the real compositional potential of verbs as well as their argument realisation possibilities. In this section I lay out the formal account in terms of Modern Type Theories that reflects the compositional patterns described informally in the preceding sections.

Data detailed above illustrate that *congelar*, as attested in the corpus, can be externally caused. Another important observation from above is that the meaning of the verb phrase clearly depends on the kind of internal argument and ranges from an event that describes a liquid becoming physically solid or an event of paralysation of an ongoing process. In addition, it has been shown that the choice of the theme influences the choice of the subject. Both facts are crucial to provide a formal representation of the selectional restrictions of *congelar*.

As discussed in chapter 2, I treat predicates that depend on the type of their arguments as dependent types. That means, the type of $\llbracket \text{congelar} \rrbracket$ depends on the type of entity that functions as its theme, A . The type of the verb *congelar* will thus be A -indexed.

According to the data laid out above, the specification of the type of *congelar* depends crucially on whether it combines with substances or eventualities. To formally represent this fact, I extend the notation by Chatzikiriakidis and Luo

(2013), such that the causative CONGELAR can be represented in the following way:

- (65) a. CONGELAR: $\Pi A: \text{entity}. B: \text{cause}. \text{CONGELAR}(B, A)$, which corresponds to a family of functions:
b. $x: \text{substance}. y: \text{cause}. \text{CONGELAR}(y, x)$
c. $x: \text{eventuality}. y: \text{cause}. \text{CONGELAR}(y, x)$

This notation expresses that CONGELAR has a dependent type, which applies to two subtypes of arguments, namely SUBSTANCE and EVENTUALITY.

It is worth recalling at this point that *congelar* combines with a wide range of arguments that can be understood as events by virtue of coercion. Despite the fact that a closer study of the process of coercion lies outside the scope of the present study, I do want to provide a short descriptive digression into this topic in this first case study.

The process of coercion is a process of predication adjustment that arises whenever there is a type conflict (Asher, 2011). Thus when a predicate demands a certain type α of its argument but the actual type of the argument is β , then coercion takes place or composition fails. For *congelar* this is the case when the verb combines with distinct kinds of entities while what it actually demands are eventualities. This happens basically when *congelar* combines with nouns that refer to images in movement, group-denoting nouns, all kinds of artefacts and nouns denoting amounts. The preferred readings these arguments receive are as follows. Images are metonymically understood as eventualities in as far as they represent moving images such as movies, as in example (46). By the event of freezing, the ongoing process of moving images is stopped at one particular image. Group-denoting nouns are coerced into events by taking a mostly ideologically oriented group as some kind of movement, as was illustrated in example (43). Artefacts, as illustrated in example (38), in turn, are coerced into events and processes by taking them as the representatives of the processes and events they are involved in. Finally, amounts, as in example (31), are coerced into events by taking their actual value as being susceptible to change and thus understanding them as some kind of process.

What coercion licenses in these cases is a mapping from β to some subtype of α . Concretely, in the theory of Asher (2011, p. 219), the mapping licenses a transformation from one category to another and thus guarantees that the presupposition of the predicate is satisfied. In the case of *congelar*, the mappings available range from images, groups, artefacts and amounts to events.

Compositionally the process of coercion (Asher, 2011, p. 214) is a process that involves some kind of shift in predication from the predication of a property of an object to the prediction of a property of an eventuality of some sort. Asher (2011),

for instance, assumes that the transformation necessary for coercion is licensed by a fine-grained functor type in combination with the right type of argument. In more detail, an argument of type β is triggered by a functor type $\delta^{\alpha\beta}$ where the output of the function is a subtype of β that depends on α . The precise formal representation of how coercion affects the type system, what kind of type shifts are necessary in each case, as well as the exact restrictions on such type shifts, however, must be left to future research.

For the time being, I only want to underline that an additional typing has to be specified for the agentive uses illustrated in 5.2.2, since these involve coercions. For the combinations of *congelar* with themes referring to artefacts, amounts, events as well as states, the verb phrases restrict the subject to agents. This semantic limitation with respect to the choice of the external argument should thus be introduced into the typing specification of *congelar*, by making explicit the restriction of the cause arguments to agents:

- (66) a. CONGELAR($y \delta^{\alpha\beta} y$):
 b. x: artefact.y:agent.CONGELAR(y,x)
 c. x: amount.y:agent.CONGELAR(y,x)
 d. x: event.y:agent.CONGELAR(y,x)
 e. x: state.y:agent.CONGELAR(y,x)

This is how an articulated type system allows us to express that a transitive verb passes its type presuppositions to its object and that these can force an additional operation during the compositional process, such as coercion. It further illustrates how a verb phrase passes its type presuppositions onto its subject. Consequently, the modern type system allows for a more explicit implementation of lexical semantic phenomena in as far as it takes into account many more semantic restrictions. These rules are understood to be part of the lexicon and the theory of predication and thorough corpus study has proved very helpful in revealing the richness of these restrictions.

A broader generalisation that emerges with the data accounted for here is that not only traditionally recognised coercing verbs like *enjoy*, *begin* and *start*, which are extensively discussed in the literature (Pustejovsky, 1995; Asher, 2011), have a strong coercive power. In fact, the data above illustrates that simple change of state verbs also appear to be susceptible to the operation of coercion. In addition, the data clearly shows that it is not the verb alone that decides the thematic nature of the subject but that these kind of decisions occur at the verb phrase level.

In the following section, I explore another aspect that emphasises the importance of the theme for the determination of a verb phrase meaning. Thus in the following section, I provide a detailed aspectual description of *congelar* in composition with themes of distinct mereological nature and analyse the aspectual

effects the different theme arguments have on *congelar*.

5.4 Aspectual behaviour of *congelar*-VPs

As I have argued in chapter 3, the aspectual characterisation of verbs has long become a standard semantic component that is explored when analysing lexical meaning. In this section, I analyse the aspectual properties of the verb which I treat in terms of the type of scale that can be associated with the verb *congelar*. In addition to that, I consider the part structure of the arguments taken by *congelar* and its effects at the verb phrase level. What is illustrated is that the mereological nature of the theme plays a crucial role for the scalar structure of a particular *congelar* verb phrase.

5.4.1 Defining the scale of *congelar*

The general intuition behind the aspectual analysis is that the progress in a particular event implies a change along a scale projected by a property lexicalised in the verb. As laid out in chapter 3.3, several researchers have suggested measuring out events by associating the telic behaviour of a verb with a function that measures the degree to which an object changes over the course of the event relative to some scalar dimension (Kennedy and Levin, 2008; Kennedy, 2012). Most prominently, the class of result verbs of which *congelar* is a member have been associated with scales (Ramchand, 1997; Caudal and Nicolas, 2005; Beavers, 2008; Levin and Rappaport Hovav, 2010). Assuming, as I do in chapter 3.3, that CoS verbs in general encode measure of change functions, it is important to determine the standard of comparison involved in the truth conditions of the positive form of the predicate *congelar*. To do so, it is first necessary to examine the set of degrees the predicate *congelar* is associated with, as well as the possible closing of the associated scale. By establishing the standard of comparison, we obtain the minimum degree required to stand out to the kind of measurement encoded by the verb and define when *congelar* applies truthfully to its arguments.

It is generally assumed that *congelar* verb phrases denote processes and therefore describe inherently durative events. This inherent durativity is associated with multiple states that the theme undergoes until reaching the final goal of being frozen. The internal durativity, in addition to the final change that comes about with a *congelar* event, has traditionally been attributed to the class of accomplishment verbs. Thus a series of measure of duration tests (Dowty, 1979) illustrates that *congelar*, particularly in composition with physical objects, patterns with accomplishments.

First, accomplishments take adverbial prepositional phrases with *en* ‘in’, but only very marginally accept adverbials with *durante* ‘for’-adverbials. If *durante* modification is possible at all, the sentence lacks the entailment to the result state of being frozen.

- (67) Juan congeló la hamburguesa en 5 minutos.
 Juan froze the hamburger in 5 minutes
 ‘Juan froze the hamburger in 5 minutes.’
 ⊨ The hamburger has frozen.
- (68) ??Juan congeló la hamburguesa durante 5 minutos.
 Juan froze the hamburger during 5 minutes
 ‘Juan froze the hamburger for 5 minutes.’
 ⊈ The hamburger has frozen.

Second, accomplishments allow for a measure of duration reading with *en*-adverbials ‘in’-adverbials and future tense. In this way the time is measured that it took for the event to be accomplished.

- (69) La hamburguesa se congelará en 5 minutos.
 the hamburger REFL freeze.FUT in 5 minutes
 ‘The hamburger will freeze in 5 minutes.’

Third, only accomplishments can occur as the complement of the periphrasis *acabar de* ‘to finish + gerund’, denoting the completion of one and the same on-going process:

- (70) La hamburguesa acabó de congelarse.
 the hamburger finished of freeze.REFL
 ‘The hamburger finished freezing.’

Fourth, the adverb *casi* ‘almost’ conveys that the event actually started but did not quite finish and thus emphasises the durativity of the event:

- (71) La hamburguesa casi se ha congelado.
 the hamburger almost REFL has frozen
 ‘The hamburger has almost frozen.’
 ⊈ The hamburger has frozen.

Fifth, accomplishments typically do not pass the progressive to perfect entailments, which illustrates that when the event of *congelar* started out, the freezing of the affected object is not guaranteed until the event is completed.

- (72) La hamburguesa se está congelando.
 the hamburger REFL is freezing

‘The hamburger is freezing.’
≠ The hamburger has frozen.

These tests apply equally well when *congelar* combines with themes of very small physical extension. Thus measure of duration readings with *en* ‘in’-adverbials and future tense work well and still denote the duration of the process.

(73) La célula se congelará en 5 segundos.
the cell REFL freeze.FUT in 5 seconds
‘The cell will freeze in 5 seconds.’

With reduced themes, *congelar* can still occur as the complement of the periphrasis *acabar de* ‘to finish + gerund’, which denotes the completion of one and the same ongoing process:

(74) La célula acabó de congelarse.
the cell finish of freeze.REFL
‘The cell finished freezing.’

Even for an extremely small object, the adverb *casi* ‘almost’ conveys that the event actually started but did not quite finish and thus emphasises the durativity of the event:

(75) La célula casi se ha congelado.
the cell almost REFL has frozen
‘The cell almost froze.’

Equally in this case, the progressive to perfect entailments are not passed, which in turn reinforces again the idea of duration.

(76) La célula se está congelando.
the cell REFL is freezing
‘The cell is freezing.’
≠ The cell has frozen.

What these tests together corroborate is that *congelar* describes durative and telic events. These can only be predicated to have felicitously occurred when the final state of the process has been reached.

Furthermore, passing the tests with objects of distinct mereological complexity illustrates that the structure of the theme seems not to influence the durativity of *congelar*-VPs. Even with reduced themes, freezing events still pattern with accomplishments. This makes *congelar* a CoS accomplishment which is associated with a process of a durative transition. Recasting the telicity characteristics of *congelar* in scalar terms, the durativity is reflected by the fact that the verb

lexicalises a multi-point scale of change.

In fact, *congelar* not only lexicalizes a multi-point scale, in addition, the scale is upper bound. The upper bound corresponds to a maximal standard in scalar terms. This means that *congelar* can only be predicated truthfully of an object if the whole object is frozen. Thus *congelar* events have a necessary endpoint, below which the event cannot be predicted to have successfully taken place. This becomes more evident when *congelar*-VPs are combined with different proportional modifiers, which provide distinct truth-conditional results. Only completive modifiers as in example (77) imply that the event has successfully taken place, while proportional modifiers like *parcialmente* ‘partially’ in (78) fail to do so.

(77) La hamburguesa se ha congelado completamente.
the hamburger REFL has frozen completely
The hamburger has completely frozen.
|= The hamburger has frozen.

(78) La hamburguesa se ha congelado parcialmente.
the hamburger REFL has frozen partially
The hamburger has partially frozen.
|≠ The hamburger has frozen.

Again, this observation applies independently of the mereological complexity of the theme.

(79) La célula se ha congelado completamente.
the cell REFL has frozen completely
The cell has completely frozen.
|= The cell has frozen.

(80) La célula se ha congelado parcialmente.
the cell REFL has frozen partially
The cell has partially frozen.
|≠ The cell has frozen.

Unlike other maximal standard verbs like, for example, *oscurecer* ‘darken’, which allows for both a minimal standard correlated with a ‘become darker’ reading and a maximal standard associated to the ‘become dark’ reading, *congelar* only allows for the maximal standard, where all parts of the theme need to reach frozenness. In particular, the fact that the progressive to perfect entailments fail, as illustrated in example (72) and repeated here for convenience in (81), shows that *congelar* is a maximal standard verb that can only be predicated truthfully of an object if the whole object is frozen.

- (81) La hamburguesa se está congelando.
 the hamburger REFL is freezing
 ‘The hamburger is freezing.’
 ≠ The hamburger has frozen.

This means that when a *congelar* event has taken place, it necessarily denotes reaching the maximum value of the relevant property. In this sense, Rusiecki (1985) notes that where two entities are unequal with respect to the relevant property, this property cannot be predicated truthfully of the lower-ranked entity. Thus example (82), including comparison, shows that the corresponding entailment of being frozen does not apply to the second member in the comparison, namely ‘the ice tea’.

- (82) Mi granizado se ha congelado más que tu ice tea.
 my slush REFL has frozen more than your ice tea
 ‘My slush has frozen more than your ice tea.’
 = The ice tea is not frozen.

An apparent counterexample to the maximality constraint for *congelar*-events is illustrated in (83).

- (83) En Arcadia, ubicada en Odessa, el Mar Negro se ha congelado
 in Arcadia, located in Odessa the Sea Black RELF has frozen
 completamente.
 completely
 ‘In Arcadia, located in Odessa, the Black Sea has frozen completely.’
 [Internet]

In this case it is not necessarily true that the whole Black Sea has frozen. Example (83) thus demonstrates that, despite an implicit maximal standard required by the verb *congelar* in order to truthfully apply, some deviation from the maximal standard is possible and we can still predict that the event has taken place. A plausible explanation for this case is to consider *en Arcadia* in Arcadia’ a frame-setting modifier, as suggested by Maienborn (2001). Thus the frame-setter sets the situation so that only the parts of the Black Sea in Arcadia are under consideration. According to Maienborn (2001, p. 194) ‘[f]rame-setting modifiers are not part of what is properly asserted but restrict the speaker’s claim.’ Consequently, when the frame-setting modifier is omitted the truth is not necessarily preserved. That means that example (83) does not necessarily imply (84).

- (84) El Mar Negro se ha congelado completamente.
 the Sea Black RELF has frozen completely
 ‘The Black Sea has frozen completely.’

The frame-setting modifier thus essentially narrows down the applicability of the description and allows us to account for the fact that it is perfectly plausible to claim that, restricted to a particular location, *Arcadia*, the Black Sea is completely frozen.

The data discussed up to now illustrate that in principle *congelar* can only felicitously apply to an object when the final state of frozenness applies to its entire structure. This means that the standard of *congelar* is 100%. Apparent deviations from the maximal standard, as illustrated in (83), seem to be a matter of frame setting. These facts make *congelar* verb phrases durative in principle.

Interestingly, however, corpus data reveal that *congelar* can also appear in verb phrases which are non-durative. This is illustrated by the aspectual behaviour of *congelar* verb phrases, which much more closely resembles achievement achievement than accomplishments. In the following example, as a typical achievement, *congelar* events can lack the measure of duration reading for *en*-adverbials ‘in’-adverbials together with future tense. Instead, what is denoted is the time delay before the event occurs.

- (85) Rabat congelará la ratificación del acuerdo pesquero en 1
Rabat freeze.FUT the ratification of the agreement fishing.ADJ in 1
hora.
hour
‘Rabat will freeze the ratification of the fishing agreement in 1 hour.’

These effects on the durativity of the event lie in the mereological nature of the theme, as I illustrate below. The influence of the theme with respect to the aspectual properties of the verb phrase becomes particularly clear when physical themes and eventive themes are contrasted. Thus it is necessary to turn to the scalar properties of the verb phrases with *congelar*, focusing first on the scale encoded by the verb itself, but also, crucially, taking into account the mereological properties of the kind of themes *congelar* combines with. Below, I lay out the complex panorama by applying aspectual tests to corpus data.

5.4.2 Non-durative *congelar* verb phrases

As briefly mentioned above, this section illustrates that when the theme of *congelar* does not have an extent internal structure, there is no relevant structure to license a durative event.⁴

Turning to the abstract domain of possible themes of *congelar*, corpus data illustrate that *congelar* in composition with eventive themes lacks the process com-

⁴With this study, I argue against the aspectual calculation of *congelar* verb phrases provided in Spalek (2014), where I conversely defended that *congelar* events are always durative.

ponent typically attributed to accomplishment events. That is, for certain combinations *congelar* patterns with achievements. For example, the uses of *congelar* in (86-a) and (87-a) are incompatible with *durante* ‘for’-adverbials, but perform better under the *en* ‘in’-adverbial test in (86-b) and (87-b).

- (86) a. #Rabat congeló la ratificación del acuerdo pesquero
 Rabat froze the ratification of the agreement fishing.ADJ
 durante 5 días.
 during 5 days
 ‘Rabat froze the ratification of the fishing agreement for 5 days.’
 b. Rabat congeló la ratificación del acuerdo pesquero en tan
 Rabat froze the ratification of the agreement fishing.ADJ in so
 sólo una hora.
 only one hour
 ‘Rabat froze the ratification of the agreement in only one hour.’
- (87) a. #El CDS congeló estas conversaciones
 the Centre Democratic and Social froze these conversations
 durante 5 días.
 during 5 days
 ‘The CDS party froze these conversations for 5 days.’
 b. El CDS congeló estas conversaciones en
 the Centre Democratic and Social froze these conversations in
 un instante.
 one instant
 ‘The CDS party froze these conversations instantly.’

In fact, the only possible reading for examples (86-a) and (87-a) with the *durante* ‘for’-adverbial refers to a preparatory process that leads up to the moment of ratification. Thus a punctual event like *ratificación* ‘ratification’ can only be understood as durative by virtue of focusing on the preceding process prior to the punctual event of ratification. This interpretation, however, is rather far-fetched.

Following the observation that certain *congelar* verb phrases lack durativity, further tests illustrate that *congelar*-sentences lack the measure of duration reading for *en*-adverbials together with future tense. Instead, what is denoted is the time that elapses before the event takes place.

- (88) #Rabat congelará la ratificación del acuerdo pesquero en 1
 Rabat freeze.FUT the ratification of the agreement fishing.ADJ in 1
 hora.
 hour
 ‘Rabat will freeze the ratification of the fishing agreement in 1 hour.’

- (89) #El CDS congelará estas conversaciones en
 the Centre Democratic and Social freeze.FUT these conversations in
 media hora.
 half hour
 ‘The CDS party will freeze these conversations in half an hour.’

Unlike in the accomplishment-type use, *congelar* in composition with eventive themes is unacceptable as a complement of *terminar de* ‘finish + gerund’ meaning finishing an ongoing process.

- (90) #Rabat terminó de congelar la ratificación del acuerdo pesquero.
 Rabat finished of freeze the ratification of the agreement fishing.ADJ
 ‘Rabat finished freezing the ratification of the fishing agreement.’
- (91) #El CDS terminó de congelar estas
 the Centre Democratic and Social finished of freeze these
 conversaciones.
 conversations
 ‘The CDS party finished freezing these conversations.’

Also typical for achievements is that the adverb *casi* ‘almost’ does not convey that the event actually took place.

- (92) Rabat casi congeló la ratificación del acuerdo pesquero.
 Rabat almost froze the ratification of the agreement fishing.ADJ
 ‘Rabat almost froze the ratification of the fishing agreement.’
 ≠ freezing took place
- (93) El CDS casi congeló estas conversaciones.
 the Centre Democratic and Social almost froze these conversations
 ‘The CDS party almost froze these conversations.’
 ≠ freezing took place

Further support for the lack of the process component in these kind of uses comes from the incompatibility with proportional modifiers. Thus the following examples illustrate that it is impossible to access any part structure of the event of ratification, deployment or negotiations.

- (94) #Rabat ha congelado la ratificación del acuerdo pesquero sólo
 Rabat has frozen the ratification of the agreement fishing.ADJ only
 parcialmente.
 partially
 ‘Rabat has only partially frozen the ratification of the fishing agreement.’

- (95) #Los soviéticos congelaron parcialmente el despliegue de los cohetes
 the Sovietic froze partially the deployment of the rockets
 SS 20.
 SS 20
 ‘The Soviets partially froze the deployment of the SS 20 rockets.’
- (96) #La alcaldía de Sevilla congeló la mitad de las negociaciones.
 the mayor’s office of Seville froze the half the of negotiations
 ‘The mayor’s office of Seville froze half of the negotiations.’

What is illustrated by examples (86) through (96) is that, despite the general assumption that *congelar* ‘freeze’ is principally a process-denoting verb, in these examples it can only describe instantaneous change.

These aspectual differences for distinct *congelar* verb phrases seem to indicate that the aspectual characterisation of the verb phrase does not emerge exclusively from the scalar behaviour of the verb. It thus becomes evident that the part structure of the theme plays a crucial role in determining the durativity or lack of durativity of a *congelar* event. As the data illustrate, differences appear with respect to the nature of the theme and the difference between physical themes and eventualities. This means that when the theme of *congelar* does not have an extent internal structure, which is mostly the case for eventualities, there will simply not be any relevant structure to license a durative event. Consequently, when formally defining the aspectual properties of a *congelar*-VP, the structure of the theme has to be taken into account crucially to determine the overall durativity of the event, as will be done in the following section.

Summing up, the following characteristics can be provided concerning the predicate *congelar*:

Table 5.1: Scalar characteristics of *congelar*

Verb	Scale	VP Durativity
<i>congelar</i>	upper bound	depending on internal structure of the theme

5.4.3 Computing the gradability and non-gradability of *congelar*-VPs

This subsection provides a formal computation of the scalar structure of *congelar*-VPs taking into account themes with distinct mereological structures. For the sake of simplicity, I perform the scalar computation of *congelar*-VPs only with the internal argument. This simplification relies on two major theoretical assumptions, which I adopt throughout this whole work: 1) As observed by Kratzer (2004),

only the direct object participates in defining the culmination of the event, which consequently makes the subject irrelevant for the aspectual computation; 2) Syntactically, I assume that the external argument is introduced separately from the verb by voice head, as in Kratzer (1996). Though the subtype of agentive *congelarse*-events does not allow for the anticaustative variant, it is still licit to illustrate the aspectual computation with the internal argument only.

As laid out in section 3.3 of chapter 3, I assume, based on Kennedy and Levin (2008), that change of state verbs in general do not encode properties but rather encode measure of change functions, that is, functions that associate objects with ordered degrees on a scale. Extending the proposal in Kennedy and Levin (2008), the measure of change function encoded by *congelarse* is given in (97).⁵

$$(97) \quad \textit{congelarse}: \lambda x \lambda e. \mathbf{congelarse}(x, e)$$

Following their analysis (Kennedy and Levin, 2008, p. 19), verbs that encode measure of change functions need to be type shifted through degree morphology in order to denote properties of events. According to their approach, this is done by the introduction of a null degree morpheme *pos*.

$$(98) \quad \textit{pos} : \lambda g \lambda x \lambda e. g(x, e) \geq \textit{stnd}(g)$$

The measure of change function g of type $\langle e, \langle \epsilon, d \rangle \rangle$, ϵ being the type of events, combined with *pos* gives as a result a relation between entities and events:

$$(99) \quad \textit{pos}(\llbracket \textit{congelarse} \rrbracket): \lambda x \lambda e. \mathbf{congelarse}(x, e) \geq \textit{stnd}(\mathbf{congelarse})$$

This relation will hold iff the value of the measure of change function **congelarse** on the pair x and e is greater than or equal to the standard value of the measure of change function. In the case of *congelarse* the standard always corresponds to the maximum, as outlined informally in the previous section. The maximal standard of *congelarse* can thus be understood to equal 1. With these basic assumptions in place, the verb is ready to combine with its theme arguments.

I start out with the aspectual structure of the verb phrase for the case when *congelarse* combines with a prototypical physical object, whose part structure is well known. I then turn to the domain of eventualities where *congelarse* verb phrases turn out to be non-durative.

In the first place, I compute the measure of change function *congelarse* with the physical theme *el lago* ‘the lake’ with a clearly extent part structure. As illustrated above, in this case, *congelarse* describes a durative event perfectly naturally.

$$(100) \quad \begin{array}{l} \text{El lago se} \quad \text{ha} \quad \text{congelado en dos días.} \\ \text{the lake REFL has frozen} \quad \text{in two days} \end{array}$$

⁵As I mentioned above, I provide the scalar analysis only for the anticaustative variant.

‘The lake has frozen within two days.’

In order to capture the effects of the mereological structure of the theme that *congelarse* events are sensitive to, as illustrated above, and thus contrast the durative with the non-durative *congelarse* phrases, I use the approach to incremental themes put forward by Kennedy (2012). In this analysis, theme arguments encode their own measure of change functions. The measure of change function encoded by the theme can thus be taken into the aspectual calculation. Using this kind of analysis allows us to reflect the aspectual behaviour of a *congelar*-VP which relays the mereological complexity of the theme argument.

For the computation of the part structure of a physical theme like *lago*, I adapt the treatment suggested by Kennedy (2012). He handles incremental readings of DPs through an incremental **partof**_Δ function by assuming that individual denoting DPs can combine with a partitive head *part_{inc}*, which takes an individual *x* and provides an expression that measures the degree to which a portion of the constitutive parts *y* of *x* changes as a result of undergoing a change in an event *e*:

$$(101) \quad \textit{part}_{inc}: \lambda x \lambda d \lambda y \lambda e. \mathbf{partof}_{\Delta}(x, y, e) \geq d$$

Applying (101) to the argument *el lago* ‘the lake’, this relation will be true if the portion *y* of lake that has undergone a change as a result of the participation in the event exceeds the degree *d*:

$$(102) \quad \textit{part}_{inc}(\llbracket \textit{el lago} \rrbracket): \lambda d \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{l}, y, e) \geq d$$

According to Kennedy’s analysis, when there is no overt degree phrase to saturate the degree argument of the incremental partitive, an appropriate standard takes over. In this case, the degree argument is fixed to an implicit standard provided by the totally closed **partof**_Δ function. This total closure of the function is due to the fact that it measures degrees to which a quantity of *y* constitutes the entity *x*, and *x*, the lake, is finite. This offers that the appropriate standard for *part_{inc}* function applied to *lago* is always a maximal and equals one.

$$(103) \quad \textit{part}_{inc}(\llbracket \textit{el lago} \rrbracket): \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{l}, y, e) = 1$$

In this way, a mereologically complex theme is analysed as encoding its own measure of change function and can now be combined with the verb.

Attaining the scalar composition of **congelarse** with an argument like *el lago* *congelarse* brings in a default standard equivalent to 1 and its theme *el lago* brings in an articulated structure. Thus *congelarse* in composition with the theme argument *el lago* is applied to some *x*, which corresponds to an object with an articulated part structure, and to some event *e*. The result will be true iff the value of the pair $\langle x, e \rangle$ on the **congelarse** measure of change function equals or exceeds

the standard for *congelarse*, which as noted is equal to 1. This means that each part of the theme needs to be affected in such a way as to successfully predicate that the event has taken place, as in example (100). Given the part structure of the theme *lago* ‘lake’, which needs to be holistically affected, the event turns out to be durative.

For the composition of the two measure of change functions, the one coming from the verb and the other coming from the argument, it has to be taken into account that in this approach both the predicate and the argument have the same type $\langle e, \langle \epsilon, t \rangle \rangle$. Consequently, functor-argument application is not straightforwardly possible. Here again, following Kennedy (2012), I assume that the denotation of the nominal combines intersectively with the denotation of *congelarse* via a version of Kratzer’s Event Identification rule (Kratzer, 1996, p. 122), defined as:

Event Identification:

If α is a constituent with daughters β, γ , such that $\llbracket \beta \rrbracket$ is type $\langle \epsilon, t \rangle$ and $\llbracket \gamma \rrbracket$ is type $\langle e, \langle \epsilon, t \rangle \rangle$ (ϵ the type of events), then $\llbracket \beta \rrbracket (e) \wedge \llbracket \gamma \rrbracket (x)(e)$

Consequently the verb phrase *congelarse el lago* can be composed in the subsequent way:

$$(104) \quad \lambda y \lambda e [\mathbf{congelarse}(x, e) \geq \mathit{stnd}(\mathbf{congelarse}) \wedge \mathbf{partof}_{\Delta}(\mathbf{1}, y, e) = 1]$$

What this formalisation represents is that, given that *congelarse* is a maximal standard verb, applying **congelarse** to any kind of theme, the event described necessarily has to affect the theme holistically to be felicitous. In the case of mereologically complex themes such as *el lago*, the event described is also durative. The maximal degree of being frozen has to apply to the whole extension of the theme, which implies duration. As has been illustrated above, the durativity of *congelarse* verb phrases seems to be pervasive for the whole domain of physical objects.

Turning to the domain of eventualities that typically combine with *congelarse*, *congelarse* appears in non-durative verb phrases, as the following examples repeated here from above (87-a) and (87-b) illustrate.

- (105) a. #El CDS congeló estas conversaciones
the Centre Democratic and Social froze these conversations
durante 5 días.
during 5 days
‘The CDS party froze these conversations for 5 days.’
b. El CDS congeló estas conversaciones
the Centre Democratic and Social froze these conversations

en un instante.
 in one instant
 ‘The CDS party froze these conversations instantly.’

In this case, **congelarse** applied to an eventive theme equally necessarily has to affect the theme holistically to felicitously predict that the event has occurred. Yet *conversaciones* ‘conversations’, though being temporally prolonged, do not evidently provide a complex part structure that is relevant to the event and would make the *congelarse* event durative. That is, *congelar* in composition with eventive themes naturally describes achievement-like events. Applying **congelarse** to an eventive theme like *conversaciones* will thus not require any extra machinery to represent the mereological structure of the theme.

$$(106) \quad \textit{congelarse las conversaciones}: \\
 (\lambda x \lambda e. \mathbf{congelarse}(x, e) \geq \textit{stnd}(\mathbf{congelarse}))(\mathbf{c}) = \lambda e. \mathbf{congelarse}(\mathbf{c}, e) \geq \\
 \textit{stnd}(\mathbf{congelarse})$$

After existential closure over the event argument we obtain:

$$(107) \quad \textit{congelarse las conversaciones}: \exists e. \mathbf{congelarse}(\mathbf{c}, e) \geq \textit{stnd}(\mathbf{congelarse})$$

The predicate will be true just in case there is a positive degree of change in the relevant property of *conversaciones*. Here again, given that *congelarse* is associated with an upper closed scale, the positive form is true of its argument and an event just in case the value returned by applying the measure of change function **congelarse** to the object *conversaciones* and the event equals the maximal degree of the $\mathbf{congelarse}_\Delta$ scale. The change yielded by the *congelarse* measure of change function is 1 and thus affects the whole theme. In addition to this, the argument *conversaciones* does not provide any relevant part structure so as to be affected by *congelarse* by parts. When combining *conversaciones* with *congelarse* there is no possible duration. This accounts for the achievement readings of *congelarse* verb phrases.

$$(108) \quad \lambda y \lambda e [\mathbf{congelarse}(x, e) \geq \textit{stnd}(\mathbf{congelarse}) \wedge \mathbf{partof}_\Delta(\mathbf{c}, y, e) = 1]$$

Interestingly, the formal representation of the application of **congelarse** to both kinds of themes looks the same. This is due to the fact that *congelarse* is a maximal standard verb and both cases are equated to the same standard. Consequently, applying **congelarse** to a theme that does not provide a relevant part structure, as in (108), as well as applying it to a mereologically complex theme, as in (104), in both cases corresponds to a holistically affected theme. The crucial difference between (104) and (108), however, is based on the mereological structure of the theme, which has an effect on the resulting durativity of *congelarse* events. More

concretely, what the difference between the two cases illustrates is that the traditionally considered durative verb *congelarse* can lose this property by virtue of the trivial structure of its theme argument.

5.5 Chapter summary

To explore the lexical semantics of *congelar* that can deal with the whole range of uses attested in the corpus and the effects of distinct theme arguments on *congelar* VPs, I have analysed in detail three crucial aspects: 1) the argument structure of the verb, 2) the process of composition when *congelar* is combined with other word meanings licensed by their argument structure, as well as 3) the aspectual properties of *congelar* verb phrases.

Summing up the results, it has been shown very clearly that the selectional restrictions of *congelar* are more flexible than usually discussed in the literature. The corpus data presented in this case study provide clear evidence that *congelar* ‘freeze’ verb phrases can display considerable meaning variation depending on the range of themes they take. As a generalisation, I suggest interpreting all eventive themes *congelar* combines with under the idea of movement and expected change. *Congelar* has also turned out to be a strongly coercing predicate allowing for combinations with many kinds of artefacts and other entities understood as eventualities. Furthermore, it has been illustrated that the distinction between physical object themes and eventive themes brings in differences in the argument realisation possibilities making the later more restrictive. Finally, it has been shown that the commonly assumed durative character of *congelar* verb phrases does not necessarily appear to always be true. When considering the range of eventuality denoting themes *congelar* verb phrases can lack durativity. The non-durative reading seems to be the default for *congelar* verb phrases with eventuality-denoting themes.

With this first case study, I want to corroborate the argument that talking about lexical meaning and considering the real use of words needs to take into account a whole range of factors that come from the semantics of the argument. Theme arguments have turned out to be especially important for determining the meaning of verb phrases given their semantic contribution as well as their capacity to help measure out the durativity of the event.

Chapter 6

CASE STUDY 2, *ROMPER*

This chapter presents a detailed case study of the verb *romper* ‘break’.¹ As in the previous case study, the overall argument pursued here is to explain apparent meaning shifts of the verb by considering the semantics of the theme and thus elucidating how the compositional meaning of *romper* with a particular theme emerges at the verb phrase level. It is shown that the theme contributes very decisively to establishing the overall meaning of a *romper*-verb phrase.

As illustrated by the contrast in examples (1) and (2), breaking can affect a physical object in that it destroys its physical integrity, while for a state like *mutismo* ‘silence’ it brings about the end of the state.

- (1) Juan rompió la ventana.
Juan broke the window
‘Juan broke the window.’
- (2) Fraga rompió ayer su mutismo político.
Fraga broke yesterday his silence political
‘Fraga broke his political silence yesterday.’ [*El País Corpus*]

Furthermore, the theme appears also to be crucial for establishing the durativity and the gradability of *romper* verb phrases. Thus the mereological structure of the theme determines whether the *romper* sentence can be modified by proportional modifiers like *parcialmente* ‘partially’ or not. As in (3), a physical object displays a clearly articulated part structure, which can easily be targeted by a proportional modifier like *parcialmente*. In contrast, a state like *silencio* ‘silence’ in (4) seems not to allow to be interrupted partially, which is similar to the effects observed for *congelar* in composition with eventuality-denoting themes.

¹This chapter builds and further elaborates on two previously published works (Spalek, 2012, 2014).

- (3) El ligamento se rompió parcialmente.
 the ligament REFL broke partially
 ‘The ligament tore partially.’
- (4) #El grito rompió parcialmente el silencio.
 the scream broke partially the silence
 ‘The scream partially broke the silence.’

Three major topics, which contribute to highlighting the importance of the theme for the meaning of the verb phrases with *romper*, are thus discussed in this chapter. In section 6.1 I provide an inventory of the kinds of themes *romper* combines with in accordance with the patterns annotated in the corpus. This provides an overview of the selectional preferences of *romper*. In section 6.2, I illustrate the syntactic realisation possibilities of *romper* at the same time as I focus on how certain kinds of themes preclude certain argument realisations. For a theoretic account these semantico-syntactic interdependencies are then situated within Modern Type Theories in section 6.3. Finally, I explore the aspectual behaviour of *romper* verb phrases via a scalar semantic analysis in section 6.4. All these aspects contribute to highlighting that in order to determine the meaning of a verb phrase we need to take into account the theme in its diverse ways of contribution.

6.1 Typical theme arguments of *romper* and their effect on verb phrase meaning

This section provides a descriptive characterisation of the typical theme arguments attested in the corpus for *romper*. The most frequent examples are grouped and characterised together, while any further details about the annotated patterns and pattern groupings can be consulted in the corpus through the CPA+R tool.

As in the previous case study, I used a battery of tests, known from the literature (Mourelatos, 1978; Resnik, 2011) to confirm that the distinct abstract nouns encountered as themes of *romper* pattern with eventualities. Here again these tests did merely confirm that most of the themes are eventualities, but did not provide any finer characterisation allowing me to differentiate several distinct subgroups of eventualities, such as states or processes, for instance. The finer-grained characterisation thus obeys my own linguistic criteria.

According to corpus evidence, the themes that *romper* usually takes can again be classified into two distinct kinds of arguments, namely physical objects and eventualities. Three major groups of eventualities have been isolated: states, processes and commitment-denoting nouns. In the latter case, the theme is often preceded by the preposition *con* ‘with’. The combinations and the kind of meaning that emerges at the verb phrase level will become clear as I proceed.

Across contexts, *romper* describes a change in the value of an attribute ascribed to its theme arguments. The target state brought about by a *romper*-event depends crucially on the nature of the theme argument. Important differences arise depending on whether the theme argument is a physical object, a process or a state, and even the kind of state has to be taken into account. Importantly, distinct combinatorial possibilities license different morphosyntactic alternations.

The kind of themes *romper* combines with most frequently, as attested in the corpus, are eventualities. Annotated under the pattern [[CAUSE]] romper [[EVENTUALITY]], they represent about 74% of the occurrences.² The major group is represented by state-denoting nominals that describe properties holding over time intervals. State-denoting nouns were collected in the pattern [[Human | Group | Event | Doctrine | Instrument]] romper [[State]] as an instantiation of the [[CAUSE]] romper [[EVENTUALITY]] pattern. Most typically *romper* appears here in composition with all kinds of states characterised by some kind of quality, such as *aislamiento* ‘isolation’, as in (5), *equilibrio* ‘balance’, as in (6), or *silencio* ‘silence’, as in (7).

- (5) Hemos de romper el aislamiento tradicional y lograr una mayor cooperación con todas las partes de España.
 have.2.PL of break the isolation traditional and achieve a mayor cooperation with all the parts of Spain
 ‘We need to end our traditional isolation and achieve greater cooperation with all parts of Spain.’ [*El País Corpus*]
- (6) La Administración Carter [...] no romperá el complicado equilibrio exterior.
 the Administration Carter not break.FUT the complicated balance exterior
 ‘The Carter Administration will not upset the complicated exterior balance.’ [*El País Corpus*]
- (7) [...] algunos grupos de jóvenes rompieron el silencio con cánticos y gritos contra las fuerzas antidisturbios.
 some groups of young people broke the silence with chants and shouts against the forces riot.ADJ
 ‘Some groups of young people broke the silence with chants and shouts against the riot police.’ [*El País Corpus*]

As a subgroups of states, I have collected the pattern [[Human | Group | Event]]

²These percentages should be understood as tendencies rather than exact values. Throughout the annotation process several examples had to be discarded for several reasons. As a consequence the these percentages do not add up to 100%.

romper [[Relation]], including all kinds of relations and bounds, as in example (8).

- (8) Uganda rompió relaciones diplomáticas con Israel en 1973.
Uganda broke relations diplomatic with Israel in 1973
'Uganda broke off diplomatic relations with Israel in 1973.'
[*El País Corpus*]

Within the group of states also falls the pattern [[Human | Event]] romper [[Union]], since the kind of union denoting nouns that *romper* combines with makes reference to the state of being united rather than the action of unification. This pattern includes distinct kinds of unions and unities as examples (9) and (10) illustrate.

- (9) La crisis de los mercados financieros rompió la unión de los partidos de
the crisis of the markets financial broke the union of the parties of
izquierda.
left
'The crisis of the financial markets broke the union of the left wing parties.'
[*El País Corpus*]

- (10) [...] la inevitable y sana diversidad según países, no
the inevitable and healthy diversity according to countries not
rompa una básica unidad de la Iglesia.
break.SBJV a basic unity of the church
'The inevitable and healthy diversity between countries should not break
the basic unity of the church.' [*El País Corpus*]

States are affected by breaking with respect to their temporal extension, the very nature of states. That means that the only change states can undergo is to end. Thus breaking affects themes like *aislamiento* 'isolation', *silencio* 'silence' or *unión* 'union' in that it brings about the ceasing of the state, as schematised in (11) through (13).

- (11) *romper* + [silencio]
Affected property: temporal progress of the state

The lexical entailment correlated with *romper* in composition with a state thus turns out to be its cessation.

In *romper relación* 'break relation', what is affected by the change of state event is the temporal holding of the relation between two parties.

- (12) *romper* + [relation]
Affected property: temporal progress of the state of being in a relation

Finally *romper unión* ‘break union’ describes the ceasing of the holding relation between at least two parties.

- (13) *romper* + [unión]
Affected property: temporal progress of the state of being in a union

A special kind of state-breaking is represented in the case of humans breaking norms. This pattern was collected separately: [[Human | Group | Act]] romper [[Norm]]. Norm-denoting nouns like ‘laws’, ‘norms’, etc. represent only one participant in a default relation that is established between a conscious agent and a particular kind of norm or law. That is, a breaking-event applied to norm-denoting nouns describes a change in the position of an agent towards a norm in force. Given that norms generally apply collectively, as with laws, taboos or traditions, these do not undergo ceasing when one individual decides to violate them, as illustrated in example (14).

- (14) Juan rompió la huelga. Los demás no nos rendimos hasta el día
Juan broke the strike. The rest no us rendered until the day
siguiente.
next
‘Juan broke the strike. The rest of us carried on until the next day.’

Romper una norma ‘break a norm’ thus describes a change in the human’s position towards a norm in force, by not respecting the norm. When the norm is a collective limit, it is not affected when just one individual crosses the limit. As I illustrate below, these semantic properties have important consequences for the argument alternation possibilities.

- (15) *romper* + [norm]
Affected property: temporal progress of a relation of an agent towards a norm

As just hinted at, certain types of nouns such as those describing conventions, norms or traditions can be understood as states by virtue of the fact that they hold throughout a certain time interval. This kind of understanding can be extended to other nouns which are not naturally associated with a temporal dimension. That is, a concept like *idea*, which does not inherently represent a kind of eventuality, can be understood as a belief-state by making explicit that we are dealing with a specific idea that is present in a certain time period. Thus *idea* turns out to be perfectly acceptable as a theme of *romper*, if it refers to a way of thinking in a certain historical moment. In example (16), this reference to a temporally extended idea is created by the prepositional phrase *de una ciencia masculina* ‘of a masculine science’. This reference converts *idea* into a temporally holding

traditional belief. This condition can also be fulfilled, if the temporal aspect of a concept like *idea* has been provided in previous discourse, though I am not going to go deeper into this fact.

- (16) Marie Curie rompió la idea de una ciencia masculina.
Marie Curie broke the idea of a science masculine
'Marie Curie shattered the concept of science as a masculine pursuit.'
[<http://cienciaycientificos.blogspot.com.es/2011/08/marie-curie-la-mujer-que-rompio-la-idea.html>]

Support for inferring states from concepts like *tabú* 'taboo' or *idea* 'idea' comes from the fact that these themes pass the eventuality test with *durar* 'last', as shown in (17) and (18). These examples shown that *tabú* 'taboo' and *idea de una ciencia masculina* 'concept of science as a masculine pursuit' do indeed encode time.

- (17) La ley/ el tabú duró muchos años.
the law/ the taboo lasted many years
'The law/ taboo lasted many years.'
- (18) La idea de una ciencia masculina duró muchos años.
the idea of a science masculine lasted many years
'The concept of science as a masculine pursuit lasted many years.'

Thus *romper* is able to combine with a wide range of distinct kinds of state-denoting themes.

Within the eventuality class of themes, about 11% are process-denoting nominals. These were collected under the pattern [[Human | Group | Event]] romper [[Process]]. Semantically 'breaking' a process describes the ceasing of its ongoing development, as illustrated in examples (19) through (21).

- (19) En el último trimestre se produjo un estancamiento en la venta
in the last trimester REFL produced a stagnation in the selling
de viviendas que rompió la evolución positiva que se había vivido
of livings that broke the evolution positive that REFL had lived
en los primeros meses.
in the first months
'In the last trimester the sales of houses stagnated, which ended with the positive trend experienced in the first months.' [El País Corpus]
- (20) La crisis inmobiliaria rompió el desarrollo económico de España.
the crisis property.ADJ broke the development economic of Spain
'The housing crisis interrupted the economic development of Spain.' [El País Corpus]

- (21) Franco no sacó a España de la miseria, más bien rompió el progreso que se iniciaba con la II República Jacobina.
 Franco not brought out to Spain of the misery much good broke the progress that REFL started with the II Republic Jacobin
 ‘Franco did not lead Spain out of poverty, but rather ended the progress that began under the Second Republic.’ [*El País Corpus*]

Notice that the process-denoting nouns that naturally combine with *romper* in Spanish, such as *progreso* ‘progress’, *desarrollo* ‘development’, *evolución* ‘evolution’, derive from the corresponding gradual completion verbs, as they were named by Bertinetto and Squartini (1995), namely *progresar* ‘progress’, *desarrollar* ‘develop’ and *evolucionar* ‘evolve’, and not from an activity verb such as *huir* ‘flee’ or *recorrer* ‘traverse’.

- (22) #Un aficionado rompió la huida del jugador.
 a fan broke the flight of the player
 ‘A fan broke the flight of the player.’

- (23) #La lluvia rompió el recorrido en caballo.
 the rain broke the travel in horse
 ‘The rain broke the horse trip.’

Characteristic of processes that can combine with *romper* is their gradual increase or decrease in a particular dimension in addition to a final goal. This suggests that only gradual processes can undergo breaking while non-incremental dynamic processes such as *huir* ‘flee’ cannot. In other words, processes that are selected by *romper* are incremental and goal-oriented, as schematised in (24).

- (24) *romper* + [process]
 Property: temporal progress towards a final goal

Consequently, the way *romper* acts on processes is that it prevents the attainment of a further stage in the development with respect to a given goal. *Romper* thus describes a ceasing of the process.

Yet another very typical use of *romper* involves combinations with commitments, which represents a use where humans commit themselves to some kind of thinking or doing or to some other person. About 14% of cases were annotated under the pattern [[HUMAN | INSTRUMENT]] *romper con* [[COMMITMENT]], which includes the preposition *con* ‘with’.

In example (25), the agent breaks with the way of thinking present in a particular era, while in example (26) a book goes against a particular doctrine.

- (25) El Rey por fin ha expresado claramente su determinación de romper
 the king for end has expressed clearly his determination of break
 con la era de Franco.
 with the era of Franco
 ‘The king finally has clearly expressed his determination to break with
 the Franco era.’ [*El País Corpus*]
- (26) [...] el libro intenta romper con la visión mecanicista del
 the book tries break with the vision mechanical of the
 socialismo.
 Socialism
 ‘The book tries to break with the mechanical vision of Socialism.’
 [*El País Corpus*]

The commitment interpretation can also apply to themes that denote certain situations as in example (27), or some cognitive criterion like a moral attitude, as in example (28).

- (27) Su obra Longa noite de pedra, que para muchos rompía con
 his work of art Longa noite de pedra, which for many broke with
 el esteticismo de la poesía gallega.
 the aestheticism of the poetry Galician
 ‘His work of art Longa noite de pedra, which for many broke with the
 aestheticism of Galician poetry.’ [*El País Corpus*]
- (28) [...] lo que hoy se llama liberarse, supone romper con
 that what today REFL calls free REFL presupposes break with
 una actitud moral aprendida, practicada sin demasiada convicción
 an attitude moral learned practiced without too much conviction
 ‘What they call self-liberation these days means making a break with an
 acquired moral attitude that one practices with not too much conviction.’
 [*El País Corpus*]

The commitment interpretation also appears when an interpersonal relation is broken, as in example (29).

- (29) Óscar rompió con su mujer.
 Óscar broke with his wife
 ‘Óscar broke up with his wife.’

Often, however, this kind of person stands in for a political movement or a way of thinking, as in example (30).

- (30) En 1933 Tarradellas rompe con Francesc Maciá.
 in 1933 Taradellas breaks with Francesc Maciá
 ‘In 1933 Taradellas parted ways with with Francesc Maciá.’ [*El País Corpus*]

These uses are reminiscent of those schematised in (15), where a human changes his/ her attitude towards a particular limit. In these cases, a human agent ends his/her commitment to a particular way of thinking. This particular way of thinking can be represented by a doctrine, a concrete era or a certain personality with whom the agent has some kind of relation, as illustrated schematically in the following.

- (31) *romper con* + [commitment]
 Property: commitment to a way of thinking/ interpersonal relation

Much more reduced is the number of combinations of *romper* with physical objects, corresponding to 8% of all annotated *romper*-sentences and represented in the pattern [[Human | Instrument]] romper [[Physical Object]]. As already noted in the previous chapter, this fact is explained by the use of a press corpus which, however, does not qualify the data as not representative. For this set of theme arguments, which I summarise here in one example, *romper*-events affect the physical integrity of the object. The resultant state effectively describes a ‘lack of integrity’ as in example (32).

- (32) Juan rompió la ventana/ el juguete/ el papel/ la camisa.
 Juan broke the window/ a toy/ the paper/ the shirt
 ‘Juan broke the window/ the toy/ tore the paper/ the shirt.’

Interestingly, *romper* differs from its equivalents in English or German in being less restrictive with respect to the material properties of physical theme arguments that can be affected. In contrast to its equivalents in English *break* or German *brechen*, Spanish *romper* does not encode manner, which would restrict its applications to themes with particular characteristics. Consequently, where Spanish describes events with *romper* alone, English and German use at least two distinct lexical items to distinguish the affectedness of the integrity of hard object (*break*, *brechen*) from a soft texture like paper or fabric (*tear*, *zerreißen*):

- (33) a. John broke the window/ the toy.
 b. #John broke the paper/ shirt.
 c. John tore/ ripped the paper/ shirt.
- (34) a. Johann brach das Fenster/ Spielzeug.
 John broke the window/ toy

- ‘John broke the window/ toy.’
- b. #Johann brach das Papier/ Hemd.
 John broke the paper/ shirt
 ‘John broke the paper/ shirt.’
- c. Johann zerriss das Papier/ Hemd.
 John tore the paper/ shirt
 ‘John tore the paper/ shirt.’

What Spanish *romper* does not allow for, however, are combinations with liquids and other mass substances such as *gas* ‘gas’ or *arena* ‘sand’. That means that specification of a selectional restriction to solid physical object is needed to account for the facts in (35) and (36).

- (35) #La piedra rompió el agua.
 the stone broke the water
 ‘The stone broke the water.’
- (36) #El golpe de viento rompió la arena/ el gas.
 the stroke of wind broke the sand/ the gas
 ‘The gust of wind broke the sand/ the gas.’

The impossibility of constructing these examples seems to be due to a broader generalisation, namely the impossibility for *romper* to combine with non-solids.³

The generalisation that applies for *romper* in composition with physical things is represented as follows:

- (37) *romper* + [physical object]
 Affected property: physical integrity

The great variety of examples above illustrates that, depending on the properties of the theme, the event brought about by *romper* describes either the loss of physical integrity, the ceasing of an eventuality or even the change of the attitude of an agent towards a particular norm or doctrine. In the following section I illustrate that the kinds of theme *romper* selects for also affect argument realisation possibilities.

³To be precise, there is a strongly lexicalised use of *romper* that applies to liquid, namely *La proa rompe el agua* ‘The bow breaks the water.’ In this case, however, *agua* metonymically refers to *la superficie de agua* ‘the surface of water’. With this in mind, the example under discussion is very similar to the scenario when *romper* selects for solid physical objects. Consequently, I do not consider *La proa rompe el agua*. to be a counterexample.

6.2 Syntactico-semantic alternations with *romper*

In relation to the kind of theme arguments *romper* selects for, corpus data reveal three syntactic realisation possibilities: 1) a causative-anticausative alternating pattern, 2) a transitive pattern without an anticausative counterpart and 3) a quite marginal exclusively intransitive pattern. These three patterns and their alternation possibilities are strongly correlated with the semantics of their arguments and each of the patterns describes a slightly different *romper*-event. Below, I discuss the patterns according to the overall frequency with which they appear in the corpus, starting with the most frequent causative-anticausative alternation.

6.2.1 The causative-anticausative alternation

As a prototypical member of the change of state verb class, *romper* appears in a causative pattern, which regularly alternates with an anticausative one. In the causative-anticausative alternation pattern, *romper* takes as theme arguments a vast variety of themes. Among them is a wide range of physical objects, which unlike English *break* vary substantially in their material qualities (*hard* and *soft*) and kinds of materials (*glass, wood, paper, fabric, skin* etc.), as illustrated in example (38). In these cases, *romper* conveys the affectedness of the physical integrity of the theme argument, which ends up in a state of lacking physical integrity.

- (38) a. Juan rompió la ventana/ un juguete/ el papel/ la camisa.
Juan broke the window/ a toy/ the paper/ the shirt
'Juan broke the window/ the toy/ tore the paper/ the shirt.'
- b. La ventana/ el juguete/ el papel/ la camisa se rompió.
the window/ the toy/ the paper/ the shirt REFL broke
'The window/ the toy/ the paper/ the shirt broke/ tore.'

The causative-anticausative alternation of *romper* is also regular for many kinds of abstract object theme arguments, which I subsume here under the denomination of 'states and processes', as in (39) through (41). In the context of eventuality theme arguments, *romper* describes the ceasing of a holding state, as in (39) and in (40), or the stopping of an ongoing process, as in (41).

- (39) a. Juan rompió la amistad (con María).
Juan broke the friendship with María
'John broke off his friendship with Mary.'
- b. La amistad con María se rompió.
the friendship with María REFL broke
'The friendship with Mary broke off.'

- (40) a. La abstención del PSOE rompe la tradicional unanimidad en
the abstention of the PSOE breaks the traditional unanimity in
la aprobación del programa de fiestas.
the approval of the program of parties
‘The abstention of the Spanish Socialist Party breaks the traditional
unanimity in the approval of the program of the festival.’
[*El País Corpus*]
- b. La unanimidad se rompe.
the unanimity REFL breaks
‘The unanimity breaks.’
- (41) a. La crisis inmobiliaria rompió el desarrollo económico de
the crisis property.ADJ broke the development economic of
España.
Spain
‘The housing crisis interrupted the economic development of Spain.’
[*El País Corpus*]
- b. El desarrollo económico de España se rompió.
the development economic of Spain REFL broke
‘Spain’s economic growth stopped.’

As discussed in chapter 3, many analyses (Levin, 1993; Levin and Rappaport Hovav, 1995; Reinhart, 2000) expect the causative-anticausative alternation to be regular for the so-called cause-underspecified verbs like *romper*. Nevertheless I illustrate below that there are regular exceptions to this rule and that these have very concrete semantic restrictions. These semantic restrictions, however, vary from verb to verb.

6.2.2 The non-alternating uses of *romper*

Among the corpus data, the anticausative variant was not found for certain *romper* verb phrases, as I illustrate in examples (42) and (43). Here again, the modifier *por sí sola/a*, ‘by itself’ added to the anticausative sentences (42) and (43) is crucial for distinguishing between the anticausative variant, presented here, and the form-identical reflexive passive in Spanish. Without the modifier, the reflexive passive would represent one possible reading of the ‘se’-form. By adding the idiomatic anaphor *por sí sola/a*, the subject of the anticausative is construed as the sole cause of the event under consideration (Chierchia, 2004) and thus identifies the cause and the theme as one unique argument.

- (42) #La ley/ la norma se rompió por sí sola.
the law/ the norm REFL broke by self alone

‘The law/ the norm broke by itself.’

- (43) #La huelga/ el ayuno se rompió por sí sola/o.
the strike/ the fast REFL broke by self alone
‘The strike/ the fast broke by itself.’

Unlike physical objects in object position, which easily combine with a whole range of cause arguments, as shown in example (44), not all abstract themes do so, as illustrated in (45). This in turn seems to be correlated with the absence of an anticausative variant, as illustrated in a related example in (46).

- (44) Juan/ la piedra/ la tormenta/ el frío/ la explosión rompió varios
Juan/ the stones/ the storm/ the cold/ the explosion broke several
cristales del autocar.
crystals of the bus
‘Juan/ the stones/ the storm/ the cold/ the explosion broke several widows
on the bus.’ [*El País Corpus*]

- (45) Juan/ #la rueda/ #el accidente/ #la anchura de la piscina/ #la
Juan/ the wheel/ the accident/ the width of the swimming pool/ the
explosión rompió la ley/ la norma.
explosion broke the law/ the norm
‘Juan/ the wheel/ the accident/ the width of the swimming pool/ the ex-
plosion broke the law/ the norm.’

- (46) #La norma se rompió por sí sola.
the norm REFL broke by self alone
‘The norm broke by itself.’

This observation can also be applied to examples (42) and (43), which lack the anticausative variant and at the same time exclusively allow for agent-subjects in the causative form, as illustrated in example (47).

- (47) ??El documento/ la lluvia rompió la huelga/ el ayuno/ la norma/ la
the document/ the rain broke the strike/ the fast/ the norm/ the
ley.
law
‘The document/ the rain broke the strike/ the fast/ the norm/ the law.’

Although uses of *romper* with this kind of themes generally subcategorise for humans, they may also allow for human-related actions as in (48) or some kind of artefact that is metonymically related to a human action as in (49).

- (48) La autorización de la ikurriña rompió un tabú que parecía sagrado.
the authorization of the ikurriña broke a taboo that seemed sacred

‘The authorization of the Basque flag broke a taboo that seemed sacred.’
[*El País Corpus (adapted)*]

- (49) El coche rompió la ley/ la norma (al aparcar en el vado del
the car broke the law/ the norm to parking in the entrance of the
hospital).
hospital
‘The car broke the law/ the norm (by parking in the entrance of the hos-
pital).’

In fact, negative evidence from the corpus suggests that the abstract themes that preclude the alternation essentially belong to a very restricted semantic class, namely the world of human obligations and duties expressed in norms and laws. In more detail, among the norm-denoting themes attested in the corpus that make *romper*-VPs subcategorise for agents are: *ley* ‘law’, *norma* ‘norm’, *tabú* ‘taboo’, *molde* ‘mold’, *código de conducta* ‘code of behaviour’, *tradición* ‘tradition’, *costumbre* ‘custom’, *esquemas de pensamiento* ‘ways of thinking’, *promesa* ‘promise’.

These data illustrate that against the general characterisation of break verbs as causative alternating verbs (Levin, 1993; Levin and Rappaport Hovav, 1995; Reinhart, 2000), not all combinations with Spanish *romper* appear in the anticausative variant. This fact raises the general question of when certain *romper* verb phrases can undergo the causative-anticausative alternation and when they preclude it. This, in turn, requires a closer look at previous analyses of the causative-anticausative alternation and the characterisation of the break class verbs.

Previous research on the verb *romper* has shown that *romper* imposes few restrictions on the cause argument, which can range from agents, natural forces, instruments, stative eventualities to events of all kinds, as illustrated in example (50), adapted from Mendikoetxea (1999, p. 1589).

- (50) Juan/ el hacha/ el huracán/ el peso de los libros/ la explosión
Juan/ the axe/ the hurricane/ the weight of the books/ the explosion
rompió la mesa.
broke the table
‘Juan/ the axe/ the hurricane/ the weight of the books/ the explosion broke
the table.’

This research suggests that *romper*-events are cause-underspecified (Mendikoetxea, 1999; Koontz-Garboden, 2009). Concretely, under the analysis of Koontz-Garboden (2009), *romper*, as an underspecified causative verb, has a representation with a generalised thematic role EFFECTOR⁴, which subsumes events, states, causes, and instruments.

⁴The EFFECTOR role was first introduced in Van Valin and Wilkins (1996).

- (51) $[[romper]] = \lambda x \lambda y \lambda s \lambda e [\exists v [CAUSE(v,e) \wedge EFFECTOR(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge not\text{-}whole(s)]]$

In the representation in (51), *romper* names an event *e* of a participant *x* coming to be in state *s*, with that CoS event being caused by an eventuality *v* in which another entity *y* is a participant and which is attributed the generalised thematic role EFFECTOR.

Under decausativisation, which, according to Koontz-Garboden (2009), in Spanish clearly corresponds to a reflexivisation operation, an underspecified causative verb like *romper* returns an anticausative reading. The undergoer of the CoS event, according to Koontz-Garboden (2009), is also the non-agentive EFFECTOR in the event that causes the change of state, as is the case for *mesa* ‘table’ in example (52). In this example there is no agentive acting upon oneself given that neither the EFFECTOR nor the *se* clitic have any agent entailments.

- (52) La mesa se rompió.
the table REFL broke
‘The table broke.’

The absence of a restriction with respect to the cause argument of the change event, however, is not available for *romper* across the board. As laid out above, combinations with norm-denoting themes seem to make *romper* more restrictive as to the thematic roles of the subject, as illustrated in (42) and repeated in the contrasting pair in (53).

- (53) a. Juan rompió la ley/ la norma.
Juan broke the law/ the norm
‘Juan broke the law/ the norm.’
b. #La ley norma se rompió por sí sola.
the law/ norm REFL broke by self alone
‘The law/ norm broke by itself.’

Concretely, as observed above, while physical objects in object position easily combine with a whole range of cause arguments, as shown in example (50), norm-denoting themes in composition with *romper* restrict their subjects, as shown in (45) and repeated here for convenience.

- (54) Juan/ #la rueda/ #el accidente/ #la anchura de la piscina/ #la
Juan/ the wheel/ the accident/ the width of the swimming pool/ the
explosión rompió la ley/ la norma.
explosion broke the law/ the norm
‘Juan/ the wheel/ the accident/ the width of the swimming pool/ the ex-
plosion broke the law/ the norm.’

This in turn seems to be again correlated with the absence of an anticausative variant, as illustrated in (46) and repeated below.

- (55) #La norma se rompió por sí sola.
the norm REFL broke by self alone
'The norm broke by itself.'

Similar kinds of observations have led several authors to acknowledge that sentences that do not allow for the anticausative pattern require agents as causers (Levin and Rappaport Hovav, 1995; Van Voorst, 1995; Alexiadou et al., 2006; Koontz-Garboden, 2009; Rappaport Hovav and Levin, 2012; Horvath and Siloni, 2011). These researchers have attributed the lack of the anticausative variant of some change of state verbs to the fact that certain verbs are inherently agentive and therefore lexically specify for two arguments. But this generalisation cannot be extended to Spanish *romper*, since the agentivity restriction is only limited to certain *romper*-VPs, namely those denoting the breaking of norms and laws.

Piñón (2001), in his analysis of change of state verbs including *break*, goes even further and claims that there are two kinds of *breakings*: a causative *break* which combines with physical themes and an agentive *break* which combines with abstract themes and lacks the anticausative pattern. Against this generalisation, Spanish corpus data show, however, that there are many combinations of *romper* with abstract object themes which do appear, perfectly well, in the causative-anticausative alternation, as illustrated in examples (40) and (41), repeated here for convenience in (56) and (57).

- (56) a. La abstención del PSOE rompe la tradicional unanimidad en
the abstention of the PSOE breaks the traditional unanimity in
la aprobación del programa de fiestas.
the approval of the program of parties
'The abstention of the Spanish Socialist Party breaks the traditional
unanimity in the approval of the program of the festival.' [*El País
Corpus*]
- b. La unanimidad se rompe.
the unanimity REFL breaks
'The unanimity breaks.'
- (57) a. La crisis inmobiliaria rompió el desarrollo económico de
the crisis property.ADJ broke the development economic of
España.
Spain
'The housing crisis interrupted the economic development of Spain.'
[*El País Corpus*]

- b. El desarrollo económico de España se rompió.
 the development economic of Spain REFL broke
 ‘Spain’s economic growth stopped.’

These data refute the idea that the dividing line between the distinct alternation possibilities for break verb phrases separates abstract themes from non-abstract themes, as claimed by Piñón (2001). In fact it is only a subset of abstract themes that disallow the anticausative pattern, which turns the account of Piñón (2001) into an overgeneralisation.

It is a general fact that many studies that acknowledge some fine-grained semantic distinctions which morphosyntactic realisations are sensitive to opt for postulating several lexical entries for one and the same verb. This, for example, is made explicit in the analysis of Piñón (2001), just presented, but also present in the system argued for by Reinhart (2003). According to Reinhart’s account the unacceptability of certain anticausative forms of generally causative alternating verbs, as is the case of Spanish *romper*, is due to having two instances of morphologically identical words. Concretely, it would be necessary to posit an agentive verb *romper*, which disallows decausativisation and a second verb *romper* without agent implications, which thus allows for decausativisation.

Yet another account that implies the two lexical entries distinction between cause-underspecified and agentive verbs was put forward by Koontz-Garboden (2009). In the analysis of Koontz-Garboden (2009), agentive verbs such as *asesinar* ‘assassinate’ have a representation with a non-underspecified thematic role, namely AGENT. Accordingly, this representation would be used for certain *romper* uses, as in (58).

- (58) $[[romper]] = \lambda x \lambda y \lambda s \lambda e [\exists v [CAUSE(v,e) \wedge AGENT(v,y) \wedge BECOME(e,s) \wedge THEME(s,x) \wedge broken(s)]]$

Under decausativisation, which in the analysis of Koontz-Garboden (2009) is equivalent to the process of reflexivisation, agentive verbs give what is generally known as a reflexive interpretation, where an event takes place in which a single agentive argument acts upon itself. That is, reflexivisation of agentive verbs cannot produce an anticausative reading in which the single argument is a non-agentive undergoer of a change of state event. This account thus explains why it is impossible to get examples like (59).

- (59) #La ley se rompió (por sí sola).
 the law REFL broke (by self alone)
 ‘The law broke (by itself).’

All three accounts effectively account for the facts of argument realisation that distinguish agentive *romper* verb phrases from causative *romper* verb phrases. Yet positing several lexical entries for one and the same verb forces a sense enumerative model of the lexicon, which lacks a broader generalisation.

Unlike the previous accounts, a recent study of the causative-anticausative alternation by Rappaport Hovav and Levin (2012) points towards a unifying analysis. The general observation of Rappaport Hovav and Levin (2012) is that many English verbs have anticausative uses and related causatives, which together constitute a causative alternation; but that both the one-argument uses as well as the two-argument uses are often found with limited choices of arguments. Particularly, for English *break*, a prototypical causative alternation verb, they acknowledge that it does not always display the causative-anticausative alternation, as illustrated in an example taken from an earlier study by Levin and Rappaport Hovav (1995, p. 85).

- (60) a. He broke his promise/ the contract/ the world record.
b. #His promise/ the contract/ the world record broke.

Rappaport Hovav and Levin (2012) show that certain causative uses cannot be instantiated with the entire range of causes and that the specific nature of the cause argument often depends on the choice of the object argument in the causative variant. In general, their investigation shows that across the class of change of state verbs the asymmetry in argument realisation possibilities is pervasive, while they claim that the distinct uses share the same root. In their proposal, Rappaport Hovav and Levin (2012) thus postulate two conditions to explain the distinct alternation restrictions.

On the one hand, they postulate the ‘direct causation condition’ according to which ‘a single argument root may be expressed in a sentence with a transitive verb, if the subject represents a direct cause of the eventuality expressed by the root and its argument’ (Rappaport Hovav and Levin, 2012, p. 166). This condition is supposed to restrict the range of possible subjects and adapt the possible causers to a concrete choice of the theme argument. On the other hand, they posit the ‘proper containment condition’ according to which under certain conditions the cause is obligatorily expressed. Concretely, this condition is at play when a change of state is properly contained within a causing act and if the argument representing that act is expressed in the same clause as the verb describing the change of state (Rappaport Hovav and Levin, 2012, p. 173). Both these additional conditions are supposed to explain the subject-object interdependencies attested through the varying range of subjects observed across different verbs or the oblig-

atory expression of the cause for certain verb-theme combinations.⁵

In line with the analysis of Rappaport Hovav and Levin (2012), I defend that rather than thinking of lexically agentive or lexically causative verbs, we should analyse the meaning of the verb phrase in more detail and only then consider the possible semantic restrictions that the VP might impose on the subject. Considering thematic selection this way helps explain the limitations of morphosyntactic realisation patterns with *romper* in composition with certain themes, while not increasing polysemy. That is, instead of taking the step of postulating two different lexical entries for *romper*, as done by many other analyses, I take the attested object-subject dependencies described above as evidence for the fact that semantic selectional restrictions are much more fine-grained than previously acknowledged and bring along morphosyntactic consequences. More concretely, and as I already pointed out in chapter 3, these dependencies in argument realisation possibilities illustrate that the semantic nature of the theme makes a difference to what the verb phrase ends up denoting. Consequently, I believe that it should not be surprising that the restrictions imposed on the external argument are different depending on the meaning of the VP.

This in turn requires a closer look at the themes that combine with *romper*. Thus, going one step further than Rappaport Hovav and Levin (2012), I explore the exact characteristics of a whole range of themes *romper* selects for as well as their concrete effects on the thematic nature of the subject.

As observed in 6.1, corpus evidence suggests that human subjects are required in cases where *romper* combines with a theme that denotes some kind of content that belongs to the world of human obligations, such as *ley* ‘law’, *norma* ‘norm’ and *tabú* ‘taboo’. These themes are essentially inert and cannot be the causes of their own change, which precludes them from being modified by an idiomatic anaphor ‘por sí solo/a’. This idiomatic anaphor would make them the sole cause of the event, as illustrated in (61). That is, any action on *ley* ‘law’ or *norma* ‘norm’, etc. ultimately depends on the intervention of an agent.⁶

- (61) #La norma/ ley se rompió por sí solo/a.
the norm/ law REFL broke by self alone
‘The law/ norm broke by itself.’

Semantically, the necessity of a subject restricted to humans seems to be correlated with the lack of direct affectedness of the theme. Laws and norms do not undergo a change through the intervention of the agent, but rather represent one participant in a relation between the agent and his obligation to obey a law or norm which

⁵A somehow related argument has been put forward by Alexiadou et al. (2006), who acknowledged that agentivity can be either inherent to the root or emerge at the verb phrase level.

⁶See Brosseau and Ritter (1991) for related observations on objects of French *briser* ‘break’.

applies to a collective. That is, laws, norms and, in general, all kinds of obligations are imposed externally on a group and cannot be affected by the sole action of one individual. Thus *romper* in these cases describes the position of the subject with respect to the limits denoted by the object, as illustrated in (62) and (63).⁷

(62) Juan rompió la norma/ ley/ tabú.
 Juan broke the norm/ law/ taboo
 ‘Juan broke the norm/ law/ taboo.’

(63) Obama rompió la tradición: no se sacó la foto en camisa
 Obama broke the tradition not REFL took the picture in shirt
 hawaiana y guirnaldas.
 Hawaiian and garlands
 ‘Obama broke with the tradition: He did not have his picture taken in a
 Hawaiian shirt and garlands.’
 [<http://www.clarin.com/tema/cumbres.html>]

The impression that the change is not solely about what happens to the direct object is further supported by the results of applying affectedness tests.⁸ First consider the ‘What happened to x is that it v.PAST’ test:

(64) Lo que le pasó a la ventana es que Obama la rompió.
 that what to it happened to the window is that Obama it broke
 ‘What happened to the window is that Obama broke it.’

(65) Lo que le pasó al desarrollo económico es que se
 that what to it happened to the development economic is that REFL
 rompió.
 broke
 ‘What happened to the economic development is that it broke.’

Both in (64) and in (65) the *ventana* ‘window’ and the *desarrollo* ‘development’ are truly affected by the change of state event and thus come to be in a new target state, namely the ceasing of a state of integrity or that of a process. On the other hand, *tradición* in (66) does not come to be in a new target state. Rather, what changes is Obama’s attitude towards his/her obligation to follow a particular tradition. The tradition itself, however, may still be in effect for many other members of a particular community.

(66) #Lo que le pasó a la tradición es que Obama la rompió.
 that what to it happened to the tradition is that Obama it broke

⁷See Van Voorst (1995) for a similar observation.

⁸The interested reader will find further affectedness tests and more discussion on them in Beavers (2011).

‘What happened to the tradition is that Obama broke with it.’
≠ The tradition ceased to exist.

Physical objects as well as processes in contrast to norm-denoting nouns also behave differently with respect to the ϕ (predicate) but not ψ (target state) test. Affirming a predicate but not the result leads to a contradiction in examples (67) and (68). Consider the ‘ ϕ (predicate) but not ψ (target state)’ test:

- (67) #Obama rompió la ventana, pero la ventana no está rota.
Obama broke the window, but the window is not broken
‘Obama broke the window, but the window is not broken.’
- (68) #La crisis inmobiliaria rompió el desarrollo económico de España,
the crisis property.ADJ broke the development economic of Spain
pero el desarrollo no está roto.
but the development not is broken
‘The housing crisis interrupted the economic development of Spain, but
the economic development is not broken.’

In contrast to this, it is perfectly plausible to have examples like (69), where the *norma* ‘norma’ is broken individually by Obama, but stays in force for the rest of the community.

- (69) Obama rompió la tradición, pero la tradición no está rota.
Obama broke the tradition but the tradition is not broken
‘Obama broke with the tradition, but the tradition is not broken.’
|= The tradition is still in force.

It thus seems that the underspecification for a cause of a *romper*-VP with *ventana* ‘window’ or *desarrollo* ‘development’ goes together with the affectedness of the theme. While underspecified causative uses of *romper* describe a true change of state in the theme, as affectedness tests prove, uses of *romper* with norm denoting themes do not express direct affectedness of the theme, but rather imply a change in the agent’s attitude towards a collective obligation.⁹ This can be observed through the failure of affectedness tests.

⁹In line with the observation that only affected themes allow for non-agentive causes goes the discussion by Folli and Harley (2004), who note that for the group of Italian consumption verbs an inanimate subject is only licensed in combinations with an explicit change of state event, which they argue is present in (i-a) through the reflexive morphology, but absent from (i-b).

- (i) a. Il mare si é mangiato la spiaggia.
the sea REFL is eaten the beach
‘The sea has eaten the beach.’
b. *Il mare ha mangiato la spiaggia.
the sea has eaten the beach

The following example illustrates that a state of such a kind, like *huelga* 'strike' can endure, despite the fact that an individual participant breaks it. (70) shows that though Juan abandons the strike, his colleagues carry on and thus maintain the strike.

- (70) Juan rompió la huelga. Los demás no nos rendimos hasta el día
Juan broke the strike. The rest no us rendered until the day
siguiente.
next
'Juan broke the strike. The rest of us carried on until the next day.'

The difference in affectedness between physical objects and processes, on the one hand, and laws and norms, on the other hand, seems to correlate with the fact that laws, norms and traditions apply collectively. That is, when an individual breaks a norm individually, the change in relation to the law applies only to this particular individual. Consequently, *leyes* 'laws' and *normas* 'norms' do not disappear despite the fact that individuals can overcome or violate them. The event of breaking a norm can accordingly be classified as not identifying an explicit change of state.

It is worth specifying further that there is a slight difference in degree of affectedness between collective obligations and individual obligations. Namely, not all kinds of obligations are imposed externally, as laws and norms. Consequently, not all kinds of obligations are collective. In fact, obligations of the kind *promesa* 'promise' or *récord* 'record' represent individually imposed limits. This semantic difference has as a consequence that individual obligations, when overcome through a *romper*-event, do indeed disappear. It can thus be specified that collectively applying limits, such as *laws*, *traditions* or *taboos*, seem to stay in force for a group, despite the fact that an individual can violate them. In these cases, the change brings about a new target state, which describes the position of the individual towards a collective limit. In contrast to that, individually established obligations, such as *promesa* 'promise', *récord* 'record', do indeed cease to exist once an individual breaks them. In these cases, a new target state comes about which is related with the disappearing of the *promesa* 'promise' or the invalidation of the *récord* 'record'.

The exclusively transitive pattern, with its alternation restrictions presented here, though not the most frequent pattern, is a very important one, since it clearly demonstrates that predication is sensitive to very fine semantic differences.

Yet another pattern that subcategorises for human subjects is represented by the use of *romper* with commitment-denoting nouns, as illustrated in the following examples.

'The sea has eaten the beach.'

- (71) La insatisfacción poética de Celaya le plantea una decisión de
 the dissatisfaction poetic of Celaya him provokes a decision of
 emergencia y rompe con el existencialismo.
 emergency and breaks with the existentialism
 ‘Celaya’s poetic dissatisfaction led him to make an emergency decision
 and break with existentialism.’ [*El País Corpus*]
- (72) [...] liberarse supone romper con una actitud moral
 to break free REFL supposes break with a attitude moral
 aprendida
 learned
 ‘Breaking free means breaking with an acquired moral attitude.’ [*El País
 Corpus*]

In these cases, the restriction to humans is due to the very nature of commitments, which presuppose an act of binding oneself intellectually or emotionally to a course of actions. Such a kind of action naturally can only be carried out by a sentient and conscious human, which explains the thematic restriction to agents. These examples again emphasise that the meaning that emerges at the verb phrase level is sensitive to extraordinarily fine-grained parameters and that themes of transitive verbs contribute very decisively in establishing the meaning of a verb phrase.

Summing up, I have shown that it is the choice of the theme that triggers some *romper*-VPs to restrict for humans in subject position. The *romper* patterns that subcategorise for a human subject thus powerfully illustrate that the semantics of the object arguments contributes to specifying the exact meaning of the verb phrase and essentially influences the thematic choice of the subject argument. This leads to the conclusion that thematic selection of the subject is sensitive to the semantics of the theme argument.

6.2.3 The non-causativising intransitive pattern

Yet another example of semantically restricted argument realisation possibilities for the verb *romper* is represented by the intransitive *romper*-pattern without reflexive morphology. Contrary to French, where the intransitive pattern without reflexive morphology is productive (Labelle and Doron, 2012), Spanish has a very restricted range of arguments that can appear in the intransitive *romper*-pattern. Arguments that appear as subjects of this pattern all belong to the domain of nature and natural phenomena and the events described by this pattern belong to the class of ‘internally caused change’ events (Levin and Rappaport Hovav, 1995). That is, the event is caused by the argument’s internal properties and thus cannot be caused externally.

- (73) Escucho olas que rompen contra las rocas.
 Hear.1st.Pers.Sing waves that break against the rocks
 ‘I listen to the waves that break against the rocks.’
 [<http://harryelsusio.wordpress.com/2014/01/20/olas-que-rompen-contra-las-rocas/>]
- (74) Los capullos rompen.
 the buds break
 ‘The buds open.’
 [<http://unionhispanoamericana.ning.com/profiles/blogs/primavera-4>]

This pattern describes the initiation of a process or the bringing about of a new state.¹⁰ In comparison to the alternating causative-anticausative pattern, which focuses on the attainment of a specific final state described by the participle of the verb, the present syntactic pattern of *romper* seems to be more dynamic. Nevertheless, it still passes affectedness diagnostics, which shows that a new target state is effectively obtained.

- (75) a. La ola rompió en la roca.
 the wave broke in the rock
 ‘The wave broke on the rock.’
 b. Lo que le pasó a la ola es que rompió en la roca.
 that what to it happened to the wave is that broke in the rock
 ‘What happened to the wave is that it broke on the rock.’
- (76) a. Los capullos del rosal rompieron.
 the buds of the rose broke
 ‘The buds of the rose bush opened.’
 b. Lo que le pasó a los capullos es que rompieron.
 that what to it happened to the buds is that broke
 ‘What happened to the buds is that they opened.’

Thus, contra other proposals that analyse such kinds of patterns as only dynamic activity events, which lack a change of state component (Labelle and Doron 2012), I take this pattern in Spanish to convey change of state. What is, however, semantically special about this change is the fact that the target states brought about by *romper* in the case of natural phenomena are not target states that can be described by the participle of the verb that describes the event, namely *roto* ‘broken’. That is, the predication does not go from –broken state to a broken state, but much

¹⁰This bringing about of a new state or process associated with this use of *romper* is certainly related to the use of *romper* as an inceptive auxiliary followed by an obligatory infinitive: ‘romper a + infinitive’ (*romper a llorar/correr/gritar* ‘break to cry/run/scream’). The detailed investigation of this periphrasis, as well as its relation to the non-alternating intransitive pattern, however, must be left for future research.

more from a state \neg broken to a completely new state P. This is exactly the reason why the test ϕ (predicate) but not ψ (target state) cannot even possibly be applied in these cases.

- (77) #Los capullos rompieron, pero no están rotos.
the buds broke, but are not broken
'The buds broke open, but they are not broken open.'

When buds 'break open' in Spanish, as in (77), the state that comes about is not their brokenness, nor any kind of interruption of the event, but rather the appearing of a completely new state, namely a flower. The same applies in the case of *olas* 'waves', which come to be in a completely new state. Consequently, the change in these cases has to be understood in a somewhat different way than it is in the prototypical causative-anticausative alternation cases.

Given that the pattern discussed here is extremely marginal, I will not analyse it in any further detail in the remainder of the chapter. Having illustrated that it does encode change, I assume that it can be understood as a change of state use, but that it is exclusively restricted to natural phenomena.

To sum up the discussion of this section, it has become clear that the possibilities for argument realisation depend on fine-grained semantic properties of the arguments. This, in turn, calls for an equally fine-grained composition system. As in the case study in chapter 5, I again turn to Modern Type Theories as a system that fulfils the need for fine-grained types.

6.3 Composing *romper*-VPs with physical objects and events

The fact that *romper* can combine with diverse kinds of themes represents a clear problem for a Montagovian type system, since the simple type system does not offer a transparent account of how the semantics of the argument can influence the semantics of the resulting predication. The data described above thus call for a compositional model that allows for a wide range of fine-grained types that can reflect the real compositional potential of verbs as well as their argument realisation possibilities. Based on the assumptions I made in chapter 2, in this section, I provide a proposal for a fine-grained type of \llbracket romper \rrbracket , such that it represents the compositional patterns described informally in 6.2.

For the causative pattern, corpus evidence shows that *romper* requires its theme to be either a physical object, an atelic eventuality, which includes states and processes, or a commitment that comprises norms and limits. For physical objects, *romper* describes an event whereby the theme argument, which starts out in a

whole state, ends up in a no longer whole state. When *romper* applies to all kinds of limit-denoting nouns, it describes the transgression of a particular norm by the agent. Finally, applied to the class of atelic eventualities, which includes states and processes, *romper* describes a ceasing of these eventualities. Thus the meaning of the verb phrase clearly depends on the type of its internal argument to denote one kind of change or another. The type of $\llbracket\text{romper}\rrbracket$ is thus A-indexed, such that it depends on the type of entity that functions as a theme. For this proposal I extend the notation of Chatzikyriakidis and Luo (2013):

- (78) a. ROMPER: $\Pi A:\text{entity}.B:\text{cause}.\text{ROMPER}(B,A)$, which corresponds to a family of functions:
 b. $x:\text{solid-phys-obj}.y:\text{cause}.\text{ROMPER}(y,x)$
 c. $x:\text{atelic-eventuality}.y:\text{cause}.\text{ROMPER}(y,x)$
 d. $x:\text{commitment}.y:\text{agent-cause}.\text{ROMPER}(y,x)$

In (78), the dependent type ROMPER can depend on three distinct types, PHYSICAL OBJECT, COMMITMENT and ATELIC EVENTUALITY, STATE and PROCESS being subtypes of ATELIC EVENTUALITY. Going deeper into the analysis of this typing, it must be said that eventualities that combine with *romper* include both, processes and states.

The propositions triggered by *romper* verb phrases in combination with eventualities thus can be schematised in the following way:

- (79) $\llbracket\text{ROMPER}\rrbracket \text{EVENTUALITY} \longrightarrow \text{CAUSE: Proposition about ceasing of a eventuality.}$

Apart from the general types of PHYSICAL OBJECT and ATELIC EVENTUALITY, there is yet another typing restriction related to limit-denoting arguments. Unlike the other types, commitment-denoting arguments in verb phrases with *romper* are restricted to humans in subject position. This restriction on the thematic role of the cause, in addition to the lack of the anticausative form for this combination, thus leads to a distinct kind of proposition, which is invoked when the direct object of *romper* is any kind of limit-denoting object, like *ley* ‘law’ or *norma* ‘norm’, as laid out in section 6.2. Semantically, the proposition triggered also conveys a distinct overall meaning. In this case, the *romper* event conveys a transgression of a commitment, an event which can only be performed by a human agent. This thus leads to postulating a subtype.

- (80) $\llbracket\text{ROMPER}\rrbracket \text{COMMITMENT} \longrightarrow \text{AGENT: Proposition about the transgression of a commitment.}$

In this way, an articulated type system allows us to account for uses attested in the corpus by permitting that transitive verbs pass their type presuppositions on to

their object, and verb phrases pass their type presuppositions on to their subjects. As in the previous case study, these facts again emphasise the broader generalisation that it is not the verb alone that decides the thematic nature of the subject.

Finally, for the intransitive pattern of *romper*, the selectional restriction to natural phenomena can be formulated via the following type constraint:

$$(81) \quad \exists x \sqsubseteq \text{NATURAL PHENOMENA} (x)$$

At the same time, this type restriction is accompanied by a restriction on argument realisation that disallows any external causes, such that the predication is as follows:

$$(82) \quad \llbracket \text{ROMPER} \rrbracket \text{ NATURAL PHENOMENA} \longrightarrow \text{Proposition about change in a natural phenomenon.}$$

Summing up so far, the compositional restrictions just discussed are not accounted for by a traditional theory of predication, which under the meaning postulate strategy could at most treat distinct uses of *romper* as different lexical entries. In this case, Modern Type Theories provide a system flexible enough to model the observed data facts within the default type specification logic.

In the following section, I treat the scalar behaviour of *romper* as yet another aspect to be taken into account in the composition process.

6.4 Scalar behaviour of *romper*-VPs

In this section, I turn to the aspectual behaviour of *romper* verb phrases as yet another crucial aspect to be taken into account when studying how meaning is construed at the verb phrase level. I basically show that the part structure of the theme is essential for establishing the gradability of a VP, which emphasises even more the contribution of the semantics of the theme to the overall meaning of a VP.

I illustrate that *romper* can affect the theme partially as well as holistically and that this behaviour depends on the structural complexity of the distinct theme arguments combined with *romper*.

6.4.1 Defining the scale of *romper*

Below, I proceed to define formally the scale associated with the predicate *romper*. The formal definition of the *romper*-scale is a necessary step for the further formal computation of the scalar structure of *romper*-VPs, which needs to take into

account both, the structure of the scale encoded by the verb and the structure of the theme.

As in the previous case study, the general assumption is that *romper*, as a member of the change of state verb class, can be associated with a scale to determine its aspectual behaviour. Thus the aspectual characterisation of *romper* is based on the idea that the progress in a particular event implies a change along a scale projected by a property lexicalised in the verb.

To pin down the scale *romper* can be associated with, it is necessary to examine the set of degrees a *romper* event can run through as well as the closure of the scale. This is done by using durativity tests on *romper* verb phrases.

Thus *romper* patterns with achievements in that it typically allows for *en*-adverbials ‘in-adverbials’, but is incompatible with *durante*-adverbials ‘for-adverbials’.

- (83) a. Juan se rompió el ligamento en 5 minutos.
Juan REFL broke the ligament in 5 minutes
‘Juan tore his ligament in 5 minutes.’
b. #Juan se rompió el ligamento durante 5 minutos.
Juan REFL broke the ligament during 5 minutes
‘Juan tore his ligament for 5 minutes.’

As is typical of achievements, *romper* verb phrases lack a measure of duration reading for ‘en’-adverbials together with future tense. They rather give the time that elapses before the event takes place, which thus only triggers the ‘after 5 minutes has passed’-reading:

- (84) El ligamento se romperá en 5 minutos.
the ligament REFL break.FUT in 5 minutes
‘The ligament will tear in 5 minutes.’

Unlike accomplishment verbs, *romper* verb phrases follow the behaviour of achievements in being unacceptable as complements of the periphrasis *terminar de* ‘finish’. If this periphrasis is acceptable at all, it describes an event where the process prior to breaking is of a distinct kind than breaking.

- (85) #Juan terminó de romperse el ligamento.
Juan finished of break.REFL the ligament
‘Juan finished tearing his ligament.’

The adverb *casi* ‘almost’ for *romper* verb phrases does not convey that the event actually took place, which illustrates a lack of duration.

- (86) Juan casi se rompió el ligamento.
Juan almost REFL broke the ligament

‘Juan almost tore his ligament.’
≠ breaking took place.

Achievements do not allow for entailments from progressive to perfect, which shows that there is no process to a *romper* event.

(87) El ligamento se está rompiendo.
the ligament REFL is breaking
‘The ligament is tearing.’
≠ The ligament has torn.

The aspectual tests together illustrate that *romper* describes punctual events. This implies that there is no degree of brokenness immediately before the event of breaking takes place, while the state of being broken appears as soon as a minimal part of the theme is broken. Thus a *romper* measure of change function basically has two values: the absence of the property of brokenness or the presence of the property. This means that the scale described by *romper* has a lower bound and the set of degrees associated is reduced to only two values, {0,1}. Consequently, unlike many other change of state verbs, *romper* does not project a complex degree-scale. Rather, the minimum non-zero value on the brokenness-scale is identical to the maximum non-zero value, which makes the standard of comparison of *romper* equal to 1. That is, the minimal standard and the maximal standard for the measure of change function *romper* coincide, with no articulation in between. Thus, despite the common assumption that CoS verbs are lexically gradable, *romper*, as a prototypically cited member of this class, exhibits extraordinary behaviour. Its set of degrees is reduced and does not project a complex degree-scale, unlike verbs like *congelar*.

Theoretically, two options are available. One option is to consider a two-value system non-scalar. In this case the change of state verb class cannot be considered to be scalar across the board, since such a crucial member as *romper* is not straightforwardly scalar. If, however, transitions with two available values are included as scalar, then the *romper* scale can be considered a trivial case of a lexically encoded scale. Together with previous researchers who have included two-point scales in scalar analysis as a special subcase of scales (Ramchand 1997; Caudal and Nicolas 2005; Beavers 2008; Rappaport Hovav and Levin 2010), I take *romper* to lexicalise a two-point scale in order to preserve the intuition that verbs of change in general can be associated with scales. Thus the singularity of the *romper* measure of change function is that by default any minimum non-zero value on the brokenness-scale is identical to the maximum non-zero value. In fact, admittedly, the choice between a trivial scale or a non-scalar verb *romper* is not crucial, since the default telicity, whether considered scalar or not, provides that any more complex scale of a *romper*-VP is drawn from the structure of the theme.

That is, I associate *romper* with a binary scale, while I illustrate in the following discussion that any complex degree-scales for *romper*-VPs seems to arise through the part structure of a theme.

Despite the fact that *romper* is an achievement verb, it can appear in gradual and non-gradual events. Thus examples (88) and (89) show that *romper* can equally affect an object partially as well as completely.

(88) Bojan se rompió el ligamento anterior parcialmente.
Bojan REFL broke the ligament anterior partially
'Bojan partially tore his anterior ligament.'
[Web]¹¹

(89) Bojan se rompió el ligamento anterior completamente.
Bojan REFL broke the ligament anterior completely
'Bojan completely tore his anterior ligament.'

The same kind of contrast seems to appear in the domain of abstract events, as will be elaborated on in the following section. The interesting observation here is that a verb that is usually associated with a trivial scale of change can appear in verb phrases with a more complex structure and affect a theme partially as well as holistically.

6.4.2 Durative *romper* verb phrases

As just hinted at above, in the company of certain theme arguments, *romper* is gradual, which also gives the impression of certain *romper* verb phrases being durative. Thus certain *romper* verb phrases do allow for *durante*-adverbials 'for-adverbials', as illustrated in (90).

(90) La expedición rompió la placa de hielo durante dos días.
the expedition broke the sheet of ice during two days
'The expedition spent two days breaking the sheet of ice.'

Furthermore, certain *romper* verb phrases also show progressive to perfect entailments, as illustrated in (91). This conveys a process reading and thus describes a durative event by which the sheet of ice is being incrementally affected.

(91) La placa de hielo se está rompiendo desde hace días.
the sheet of ice REFL is breaking from makes days
'The sheet of ice has been in the process of breaking for some days.'
|= The sheet of ice has broken.

¹¹<http://www.superdeporte.es/futbol/2011/05/07/bojan-vuelve-grupo/127274.html>

Finally, certain *romper* verb phrases do also license comparison, which illustrates that *romper* can affect an entity to different degrees.

- (92) Esta placa de hielo está más rota que la otra.
this sheet of ice is more broken than the other
'This sheet of ice is more broken than the other.'

That is, durative and gradual event descriptions for *romper* take their more articulated scale from the extension of the theme *placa de hielo*, as illustrated in examples (90) through (92). This fact makes the CoS verb *romper*, which has been claimed to be lexically scalar (Levin and Rappaport Hovav, 2010), appear similar to incremental theme verbs, which draw the scale from their theme arguments.

The contrast in affectedness of *romper*-VPs between extent and non-extent themes, illustrated in the physical domain by comparing the theme arguments *ligamento*, 'ligament' and the *placa de hielo*, 'sheet of ice', does not directly translate into the domain of eventualities.

Romper in combination with eventualities seems always to describe instantaneous events. Thus, in composition with a state like *silencio* 'silence', the *romper* verb phrase is non-durative, as illustrated in example (93). The fact that the event fails modification by *parcialmente* 'partially' shows that *silencio* 'silence' is holistically affected by the event of breaking.

- (93) #El grito rompió parcialmente el silencio.
the scream broke partially the silence
'The scream partially broke the silence.'

The property of *silencio* that is affected by the change of state is the temporal progress of the state for which it simply has no relevant part structure and thus only allows for punctual *romper*-VPs.

The same occurs for other kind of eventualities, such as an oral agreement *acuerdo*, which we might assume to possess sub-parts. Still, in combination with *romper* the resulting verb phrase is punctual. Applying distinct durativity tests, as illustrated in (94) and (95), it can be observed that there is no duration in these events. That means *romper* applied to *acuerdo* 'agreement' also triggers a punctual event.

- (94) #El acuerdo con Colombia estaba rompiéndose desde hace días
the agreement with Colombia was breaking REFL from makes days
hasta que se rompió completamente.
until that REFL broke completely
'The agreement with Colombia was breaking for days, until it broke completely.'

- (95) #El acuerdo con Colombia está más roto que el acuerdo con
 the agreement with Colombia is more broken than the agreement with
 Cuba.
 Cuba
 ‘The agreement with Colombia is more broken than the one with Cuba.’

I assume that this is the case because a state like *silencio* ‘silence’ or *acuerdo* ‘agreement’ that is affected throughout the change of state is its temporal progression. It holds holistically of the state and it appears thus that the mereological structure of the theme is not relevant to the event. Consequently, the mereological structure of the theme does not influence the scalar properties of the resulting verb phrase.

Only explicit mention of a mereologically complex structure of the *acuerdo* ‘agreement’ can make the *romper*-VP gradual. Thus, in example (96), the salient interpretation of *acuerdo* is the holding state of a binding relation, and the parts structure, which is made explicit by mentioning ‘imports’ and ‘cultural exchange’, makes the *romper*-VP gradual. Consequently, the *romper acuerdo*-VP is felicitously modified by the proportional modifier *parcialmente* ‘partially’.

- (96) Chávez rompió parcialmente el acuerdo con Colombia al
 Chávez broke partially the agreement with Colombia to the
 prohibir las importaciones de productos colombianos. El
 prohibit the imports of products Colombian.PL The
 intercambio cultural, sin embargo, se mantuvo intacto.
 exchange cultural without impediment REFL maintain intact
 ‘Chávez partially broke the agreement with Colombia by prohibiting the
 importation of Colombian products. Cultural exchange, however, was
 maintained.’

It is worth mentioning at this point that *acuerdo* ‘agreement’ is a dual aspect noun of the kind observed by Pustejovsky (1995) and Asher (2011). That means that it can not only denote a state of agreement, but also a written document. That is, *acuerdo* ‘agreement’ has two logically related denotations. That is why *acuerdo* appears to have an eventive and a physical aspect. In composition, one of the aspects is selected. This dual nature of *acuerdo* has consequences for the gradability of the event. When *acuerdo* is interpreted as an eventuality without explicit mention of the part structure, the event is preferably punctual, as the tests in (94) and (95) show. When it denotes a physical object, namely a document, the *romper*-VP is preferably gradable, as the application of durativity tests in (97) to (99) illustrates.

- (97) Chávez rompía el largo acuerdo durante media hora.
Chávez breaking.IMP the long agreement during half hour
'Chávez spent half an hour tearing the long agreement up.'
- (98) El acuerdo, que estaba en la mesa, estaba rompiéndose desde
the agreement that was in the table was breaking REFL from
hace días hasta que se rompió completamente.
makes days until that REFL broke completely
'The agreement, which was on the table, was in the process of tearing for
days, until it finally tore in two.'
- (99) El acuerdo, en el papel rojo, está más roto que el del papel
the agreement in the paper red is more broken than the of the paper
amarillo.
yellow
'The agreement on red paper is more torn than the one on yellow paper'

The variable gradable behaviour of *romper* verb phrases shows that the mereological structure of the event is not established by the verb's aspectual properties alone. As the data illustrate, the part structure of a theme, be it an entity or an event, crucially contributes to establishing the gradability of the verb phrase. Physical object themes seem to have a well-understood part structure, which makes it easy to imagine how *breaking* might affect a particular object. Eventive themes, in contrast, seem to trigger rather naturally punctual readings, which describe the ceasing of an ongoing event, process or state. Their possible substructure has to be made explicitly available, as is done with 'importation of products' and 'cultural exchange' in (97). Only by so doing can it be understood that some parts can undergo the change in temporal persistence, while others do not.

All these facts illustrate that at the level of the VP, gradability is computed from both the scalar structure encoded in the verb and the mereological structure of the theme. To establish more concretely the contribution of each of the parts, in the following section I provide a formalisation of how to compute both scales.

To sum up, the following characteristics list can be provided concerning the predicate *romper*:

Table 6.1: Scalar characteristics of *romper*

Verb	Scale	Durativity
<i>romper</i>	lower bound	depending on internal structure of the theme

6.4.3 Computing the gradability of *romper*-VPs

In this section I provide a formal representation of the variable durativity and gradability, but not the variable telicity, of *romper*-VPs. I illustrate how the trivial scale associated with *romper* behaves in composition with the scales of themes of distinct mereological complexity. It is shown that, given the triviality of the scale of *romper*, any durativity or gradability of *romper* verb phrases proceeds from the complex structure of the theme. To capture the effects of the mereological structure of the theme argument and thus account for the variable gradability of *romper*-VPs, I once again adopt the approach to incremental themes from Kennedy (2012). I thus analyse the part structure of the theme argument as encoding its own measure of change function that can be inherited by the VP as a whole.

With respect to computation, I will illustrate the scalar analysis of *romper*-VPs with theme arguments of distinct mereological complexity using the intransitive variant *romperse*. This is done for the same reasons as explained in the case study of *congelar* in chapter 5. The first step is to provide the measure of change function encoded by the predicate. The measure of change function encoded by *romperse* is given in (100):

$$(100) \quad \textit{romperse}: \lambda x \lambda e. \mathbf{romperse}(x, e)$$

According to Kennedy & Levin's (2008: 19) analysis, a measure of change function encoding verb needs to be type shifted through degree morphology to denote properties of events, which is done by the introduction of a null degree morpheme *pos*.

$$(101) \quad \textit{pos}: \lambda g \lambda x \lambda e. g(x, e) \geq \textit{std}(g)$$

The measure of change function g of type $\langle e, \langle \epsilon, d \rangle \rangle$, ϵ being the type of events, combines this way with *pos* and gives as a result a relation between entities and events:

$$(102) \quad \textit{pos}(\llbracket \textit{romperse} \rrbracket): \lambda x \lambda e. \mathbf{romperse}(x, e) \geq \textit{std}(\mathbf{romperse})$$

This relation will hold iff the value of the measure of change function **romperse** on the pair x and e is greater than or equal to the standard value of the measure of change function. In the case of *romper*, the standard is always going to be 1 due to the default telicity of *romper*. The verb is now ready to combine with its theme argument.

First I take a theme argument that denotes an eventuality with no relevant internal structure, namely *silencio*. The structure of the state *silencio* does not prove relevant to the duration of the event, because the property that is affected by the

change of state, namely the temporal progress of the state *silencio*, is holistic of the state of *silencio*. That means that, with respect to the change, the temporal progress holds holistically of the whole interval of *silencio*. This is independent of the fact that a state like *silencio* might actually have distinguishable parts to it, such that two minutes of silence contain one minute of silence. As a consequence, the mereological structure of the theme does not influence the scalar properties of the resulting *romper* verb phrase. This is reflected in the formal composition in that it can proceed directly without the need of recurring to the structural complexity of the theme.

$$(103) \quad \textit{romperse el silencio}: (\lambda x \lambda e. \mathbf{romperse}(x, e) \geq \textit{stnd}(\mathbf{romperse}))(\mathbf{s}) = \lambda e. \mathbf{romperse}(\mathbf{s}, e) \geq \textit{stnd}(\mathbf{romperse})$$

After existential closure over the event argument we obtain:

$$(104) \quad \textit{romperse el silencio}: \exists e. \mathbf{romperse}(\mathbf{s}, e) \geq \textit{stnd}(\mathbf{romperse})$$

The predicate will be true just in case there is a positive degree of change in the relevant property of silence. As illustrated in section 6.4.1, lexical information provides that the verb *romper* is associated with a two-point, closed scale, which naturally allows only for two degrees, $\{0,1\}$. Consequently, if *romperse* is associated with a two-point scale, any minimal non-zero degree of the predicate *romper* d_{0+} is by default equivalent to the maximal degree d_{max} : $d_{0+} = d_{max} = 1$.

That is, given that the non-null degree of change yielded by the *romper* measure of change function is 1, and the theme argument *silencio* is affected holistically by the change, the VP is not gradual in any interesting way. Consequently, the predicate should be instantaneously telic, which is corroborated by the impossibility of adding a proportional modifier like *parcialmente* ‘partially’ in example (105).

$$(105) \quad \# \text{El silencio se rompió parcialmente.} \\ \text{the silence REFL broke partially} \\ \text{‘The silence broke partially.’}$$

Recall, however, that *romper*-VPs can be non-trivially gradual when the theme argument has a part structure that can undergo the event of breaking by parts. To account for examples as *romper el ligamento parcialmente* ‘tear the ligament partially’ or *romper la placa de hielo*, ‘break the sheet of ice’ it is necessary to access the part structure of the theme. A mereologically more complex structure of the theme can thus act as an event-delimiting argument by introducing a more complex degree structure. In such cases the event becomes effectively durative and gradual.

Once again, I follow the formalism of Kennedy (2012) and introduce at this

point an incremental **partof**_Δ function to handle incremental readings of the DP. An individual-denoting DP thus combines with a partitive head *part_{inc}*, which takes an individual *x* and provides an expression that measures the degree to which a portion of the constitutive parts *y* of *x* changes as a result of undergoing a change in an event *e*:

$$(106) \quad \textit{part}_{inc}: \lambda x \lambda d \lambda y \lambda e. \mathbf{partof}_{\Delta}(x, y, e) \geq d$$

Applying (106) to the argument *el ligamento* ‘the ligament’, this relation will be true if the portion *y* of ligament that has undergone a change as a result of the participation in the event exceeds the degree *d*:

$$(107) \quad \textit{part}_{inc}(\llbracket \textit{el ligamento} \rrbracket): \lambda d \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{1}, y, e) \geq d$$

As mentioned in the previous chapter, when there is no overt degree phrase to saturate the degree argument of the incremental partitive, an appropriate standard takes over. In this case, the degree argument is fixed to an implicit standard provided by the totally closed **partof**_Δ function. Total closure of the function is given by the fact that it measures degrees to which a quantity of *y* constitutes the entity *x*, and *x* is finite. The options for the appropriate standard are thus only two: a maximum standard and a minimum standard. That is, the value of *d* can be either >0, in the case that a minimal part of the individual *x* is affected, or 1. This offers the following two possibilities for the *part_{inc}* function applied to *ligamento*, which correspond to examples (109) and (110) respectively.

$$(108) \quad \begin{array}{l} \text{a. } \textit{part}_{inc}(\llbracket \textit{el ligamento} \rrbracket): \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{1}, y, e) > 0 \\ \text{b. } \textit{part}_{inc}(\llbracket \textit{el ligamento} \rrbracket): \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{1}, y, e) = 1 \end{array}$$

(109) El ligamento se rompió parcialmente.
the ligament REFL broke partially
‘The ligament tore partially.’

(110) El ligamento se rompió completamente.
the ligamento REFL broke completely
‘The ligament tore completely.’

Recall here again that for the composition of the predicate *romperse* and *part_{inc}* $\llbracket \textit{el ligamento} \rrbracket$ both have the same type $\langle e, \langle \epsilon, t \rangle \rangle$. Consequently, functor-argument application is not possible. Here again, I assume that the nominal combines interactively with *romperse* via a version of Kratzer’s Event Identification rule (Kratzer, 1996, p. 122) as follows:

$$(111) \quad \begin{array}{l} \text{a. } \lambda y \lambda e [\mathbf{romperse}(y, e) \geq \textit{stnd}(\mathbf{romperse}) \wedge \mathbf{partof}_{\Delta}(\mathbf{1}, y, e) > 0] \\ \text{b. } \lambda y \lambda e [\mathbf{romperse}(y, e) \geq \textit{stnd}(\mathbf{romperse}) \wedge \mathbf{partof}_{\Delta}(\mathbf{1}, y, e) = 1] \end{array}$$

For the composition, **romperse** brings in a default standard equivalent to 1, while its argument can be affected either holistically or partially. Thus *romperse* in composition with the theme argument has two options. First, when we apply **romperse** to some y , which corresponds to a part of the ligament and to some event e , the result will be true iff the value of the pair $\langle y, e \rangle$ on the **romperse** measure of change function equals or exceeds the standard for *romperse*, which, as noted, is equal to 1. This means that for each part that undergoes breaking, the breaking of the part is not a gradual event, but the whole VP can be gradual insofar as the predicate holds of successively larger parts of the ligament, parts which can be inherited by the VP as a whole, as illustrated in (111-a). Second, if we take (111-b), where 1 is the standard value, we will get a completely non-gradual interpretation for *romperse el ligamento*. This predicate affects the theme holistically, which corresponds to an achievement-like interpretation for the VP *romperse el ligamento*. The application of **romperse** to some theme x that is affected holistically, such as in the case of *silencio*, in (104) can be considered a special case of the second case. In these cases the VP is non-gradual, given the total lack of incremental parts of *silencio*.

What is thus illustrated is that the mereological structure of the theme does in fact have an effect on the resulting scale of a *romper*-VP. More explicitly, it illustrates that the simple scale encoded in an achievement verb does not need to determine the overall gradability of the verb phrase, since the theme can also contribute to establishing a more complex scale. The data illustrated here corroborate the previously explored idea that degree structure is not a purely lexical phenomenon, in this case inherited from the verb, but rather is construed at sentence level Dowty (1979); Krifka (1989b); Caudal and Nicolas (2005).

6.5 Chapter summary

All in all, the corpus data presented in this case study provide clear evidence for the view that *romper* varies in meaning across syntactic patterns and theme arguments and is not sufficiently accounted for when defined as a verb that always describes the same kind of transition, namely ‘change of material integrity’. Here again, in order to provide a minimal lexical semantics that can deal with the whole range of uses attested in the corpus, I have analysed in detail three crucial aspects: 1) the argument structure of the verb, 2) the process of composition when *romper* is combined with other word meanings licensed by its argument structure and 3) the aspectual properties of *romper* verb phrases.

Summing up the results, it has been shown very clearly that the selectional restrictions of *romper* are less stringent than usually acknowledged. I have illustrated on the basis of a wide range of corpus examples that Spanish *romper*

selects for all kinds of physical objects, except liquids, as well as a whole range of eventualities such as states and processes.

Furthermore, I have illustrated that the argument realisation possibilities of *romper* are also related to the semantic nature of the selected theme. Most prominently, *romper* in composition with commitment-denoting themes does not appear in the anticausative form.

With respect to its aspectual behaviour, it is especially worth noting that *romper* is associated with a trivial scale, which is typical of achievements. Nevertheless *romper* does appear in durative and gradual *romper* verb phrases, which rely on the mereological structure of the theme.

This case study thus further supports the argument that analysing lexical meaning and considering the real use of words needs to take into account a whole range of contextual factors and very crucially the arguments predicates select for.

Chapter 7

CASE STUDY 3, *CORTAR*

This chapter sets out the third case study of a change of state verb, namely *cortar* ‘cut’, and its behaviour in composition. With this case study, I yet again pursue the argument that what has usually been considered meaning shifts of the verb, as illustrated in the contrast between examples (1) and (2), can receive a compositional analysis, if we take into account the capacity of the theme to influence the meaning of the whole verb phrase.

- (1) [...] la policía cortó las cadenas.
the police cut the chains
‘The police cut the chains.’ [*El País Corpus*]
- (2) Manuel Campo Vidal cortó la conferencia de prensa del
Manuel Campo Vidal cut the conference of press of the
mismísimo vicepresidente del Gobierno.
own.SUPERLATIVE vice president of the government
‘Manuel Campo Vidal interrupted the press conference of none other than
the vice president of the Government.’ [*El País Corpus*]

A related observation was expressed by Searle (1980, p. 222-3) when he considered a range of different physical objects that English *cut* can be predicated of, as I already mentioned in chapter 2.

Though the occurrence of the word ‘cut’ is literal in [both] utterances, and though the word is not ambiguous, it determines different sets of truth conditions for the different sentences. The sort of thing that constitutes cutting the grass is quite different from, e.g., the sort of thing that constitutes cutting a cake. One way to see this is to imagine what constitutes obeying the order to cut something. If someone tells me to cut the grass and I rush out and stab it with a knife, or if I am ordered to cut the cake and I run over it with a lawnmower, in

each case I will have failed to obey the order. That is not what the speaker meant by his literal and serious utterance of the sentence.

In other words, Searle (1980) basically points out that depending on the choice of the theme the event described is a different one. Thus ‘cutting a cake’ describes an action where a sharp object is used to divide a cake into pieces, while ‘cutting the grass’ is associated with an event of using a lawnmower and running it over a surface of grass. Taking such data seriously calls for reviewing the process composition.

As in the previous case study, three basic characteristics are explored. First, in section 7.1, I provide a descriptive analysis of the combinatorial capacity of *cortar*. Second, in section 7.2, I address the argument alternation possibilities and restrictions and how they depend on the semantics of the themes. The described relations between the semantics of the arguments and morphosyntactic realisation possibilities are accounted for in section 7.3 within Modern Type Theories. Finally, in section 7.4, I explore yet another semantic aspect, namely the aspectual behaviour of *cortar* verb phrases and how it varies together with the choice of certain theme arguments. All in all, this detailed analysis aims at providing a truthful picture of the lexical semantics of *cortar*.

7.1 Typical theme arguments of *cortar* and their effect on the meaning of the verb phrase

Parallel to what has been done in the preceding case studies, in this section I descriptively group the kinds of theme arguments which the verb under consideration can be usually combined with. I list the most frequent and most representative themes, according to the kind of classification that I have given them in the corpus. It is worth recalling here again that the classification of theme arguments has been a difficult task, given that no available thesaurus nor any other lexical resource was judged appropriate for this classification. Thus, as for the other two cases, the classification of abstract themes is rather tentative and it mainly serves the purpose of making generalisations about the combinatory behaviour of *cortar*. Here again I have used several tests, as the one illustrated in chapter 5.1, which confirm that most of the themes *cortar* combines with denote eventualities or are understood as eventualities. Similarly to the other case studies, no specific information was obtained as to the semantic differences among the themes that did classify as eventualities. The subgroups of nouns I identified thus mainly rely on my linguistic intuition. Further detailed information with respect to the patterns and the groupings can be consulted through the CPA+R tool made available online (<http://marke.upf.edu/cpa/index.php?action=main>).

Corpus evidence show that *cortar* basically combines with physical objects and eventualities, which in turn include several subtypes that convey important semantic differences, as I illustrate case by case below. According to corpus data, *cortar* selects most frequently for all kinds of eventualities which are caused by diverse kind of causes. This use of *cortar* was collected under the pattern [[CAUSE]] cortar [[EVENTUALITY]], following the system of labelling explained in chapter 4. This pattern represents some 72% of the annotated data and is instantiated by four major subpatterns. Event nouns, collected under [[Human | Group | Act | State | Event | Artefact]] cortar [[Event]], represent the most numerous kind of themes that form a subpattern of [[CAUSE]] cortar [[EVENTUALITY]]. The following corpus examples are instantiations of [Human | Group | Act | State | Event | Artefact]] cortar [[Event]].

- (3) Francia corta la entrega de etarras.
France cuts the delivery of ETA members
'France stops the extradition of ETA members.' [*El País Corpus*]
- (4) El técnico británico afirma que su decisión corta definitivamente cualquier especulación sobre un posible acuerdo con el Barcelona.
the technician British confirms that his decision cuts definitively any speculation about a possible agreement with the Barcelona
'The British soccer coach claims that his decision definitively cuts off any speculation about a possible agreement with the Barcelona Football Club.'
[*El País Corpus*]
- (5) Cortó los intentos de algunos miembros del comité de iniciar un debate.
cut.3.SG the attempts of some members of the committee of initiate a debate.
'He cut off the attempts of some members of the committee to start a debate.'
[*El País Corpus*]
- (6) [...] los sollozos le cortaban la respiración y le anudaban la voz en la garganta.
the sobs to him cut the breathing and to him knot the voice en the throat
'The sobbing was taking his breath away and causing a lump in his throat.'
[*El Corpus del Español*]

For these kinds of combinations, *cortar* denotes the interruption of an ongoing event described by *entrega* 'delivery', *especulación* 'speculation', *intentos de iniciar un debate* 'attempts to initiate a debate' or *respiración* 'breathing'.

Among the event-denoting nouns *cortar* appears with, certainly the most salient is the noun *tráfico* ‘traffic’, as illustrated in the following example. As a result of performing the cutting event, the circulation of vehicles, that is the traffic, ceases.

- (7) [...] una concentración que, sin autorización de la Delegación a concentración that, without authorisation of the delegation del Gobierno, cortó el tráfico de la ciudad [...]. of the Government cut the traffic of the city ‘a demonstration, which, without the authorisation of the Government delegation, blocked traffic in the city.’ [*El País Corpus*]

As subpatterns of the class of event nouns, I additionally classified a whole range of other kinds of themes which are metonymically related to events. Thus a metonymic relation to *tráfico* is established for cases where *cortar* combines with locations that support traffic, as illustrated in the following examples.

- (8) [...] los participantes cortaron las calles sin que la policía se the participants cut the streets without that the police REFL lo impidiese. that impedes ‘The participants blocked the streets and the police did nothing to stop them.’ [*El País Corpus*]
- (9) La policía cortó los puentes que unen sobre el río Vitava la Parte the police cut the bridges that unite over the river Vitava the part Vieja de Praga con la Parte Pequeña. old of Prague with the part small ‘The police closed the bridges over the river Vitava that join the old part of Prague with the small part.’ [*El País Corpus*]
- (10) Un argayo cortó parcialmente la carretera regional AS-16 entre a landslide cut partially the highway regional AS-16 between Soto del Barco y Pravia. Soto del Barco and Pravia ‘A landslide partially blocked the AS-16 regional highway between Soto del Barco and Pravia.’ [*Web*]¹

These examples collected in the subpattern [[Human | Group | Artefact]] cortar [[Location]] represent clear cases of coercions, given that neither the locations nor the objects that refer to locations are physically being cut. Rather what undergoes the event of cutting is the circulating traffic of vehicles or people.

¹[<http://www.lne.es/sucesos/2013/05/05/argayo-corta-parcialmente-via-soto-pravia-tapona-acceso-playa-pendueles/1407360.html>]

Similar to the location describing nouns, understood as the flow of traffic they carry, is yet another subpattern of [[Human | Group | Act | State | Event | Artefact]] cortar [[Event]], namely [[Human | Group]] cortar [[Artefact]]. This pattern reflects the fact that distinct kinds of artefacts are metonymically related to telic events and processes that take place on and through these artefacts. As such, the events that involve these artefacts can be stopped by cutting. Thus, in the following examples, neither the gas pipelines *gasoducto* in (11) nor the telephone lines *líneas telefónicas* in (12) are really physically affected. Rather, the cutting event describes an interruption of the gas supply or the interruption of the continuous flow of the telephone signal supply.

- (11) Argelia corta un gasoducto.
 Algeria cut a gas pipeline
 ‘Algeria cut off a gas pipeline.’ [*El País Corpus*]
- (12) Los soldados cortaron las líneas telefónicas y registraron todos los
 the soldiers cut the lines telephonic and registered all the
 lugares del hotel en busca de seguidores de la oposición.
 places of the hotel in search of followers of the opposition
 ‘The soldiers cut the telephone lines and searched everywhere in the hotel
 in order to find the followers of the opposition.’ [*El País Corpus*]

Within the event nominals group yet another pattern was identified, namely [[Human | Group]] cortar [[Continuous Stream]]. This pattern includes natural phenomena such as electricity or gas, which in turn stand in for the process of supplying these kinds of substances. The cutting event conveys that the supply of these kinds of substances is interrupted, as illustrated in the following two examples:

- (13) [...] un encargado se refugió en el interior del
 a person in charge REFL took refuge in the interior of the
 establecimiento y cortó la energía eléctrica.
 establishment and cut the energy electric
 ‘A site manager took refuge in the interior of the establishment and cut
 off the electricity.’ [*El País Corpus*]
- (14) Un empleado cortó el gas de la zona para evitar explosiones.
 an employee cut the gas of the zone for avoid explosions
 ‘An employee cut off the gas in the area in order to prevent explosions.’
 [*El País Corpus*]

Finally, still another subcase of nouns understood as events was collected under the pattern [[Human]] cortar a [[Human]]. In this group, the metonymy goes from people to events associated with these people. Particularly frequent is the coercion

from a person to a speech act, as illustrated in the following example:

- (15) El presidente del tribunal [...] cortó en seco al letrado: ‘Usted
the president of the court cut in dry to the lawyer you
no da nada!’
not give nothing
‘The president of the court suddenly cut off the lawyer: ‘You aren’t con-
tributing anything!’ [El País Corpus]

Other kinds of events associated with people, however, are also possible, such as the event of applauding in (16) or even a cumulus of distinct activities, such as eating, chatting or taking a walk as in example (17). The concrete meaning that emerges in this case is that the episcopal delegation did not feel embarrassed by devoting time to these activities.

- (16) Brodsky cortó con un gesto a un par de espectadores que
Brodsky cut with a gesture to a pair of spectators who
pretendían aplaudir.
pretended applaud
‘With a gesture, Brodsky cut off some spectators who were going to ap-
plaud.’ [El País Corpus]
- (17) La comitiva episcopal no se cortó: cenaron en el parador,
the retinue episcopal not REFL cut dined in the luxury hotel
prolongaron la sobremesa hasta las tres de la madrugada y
extended.3pl the after-dinner until the three of the morning and
decidieron después pasar la noche paseando por los jardines [...].
decided after pass the night walking through the garden
‘The episcopal delegation did not limit themselves: they dined in the
luxury hotel, they prolonged the after-dinner conversation until three in
the morning and decided to spend the night walking through the gardens.’
[El País Corpus]

This same use can appear with a reflexive clitic which conveys that the event of cutting is performed by the agent on him/herself, as in the case of the football club El Málaga in the following example.

- (18) El Málaga no se cortó en el juego duro para quitar el balón
the Malaga not REFL cut in the play hard for remove the ball
al Madrid.
to the Madrid
‘The Malaga football club did not relent, and managed to steal the ball
from the Madrid football club.’ [El Corpus del Español]

The meaning that emerges in all the three cases of cutting an event performed by a human conveys a meaning of controlling oneself or the action of others.

All in all, event nouns, including all kinds of arguments that are understood as events, represent about 52% of the annotated corpus data. Schematically, the way *cortar* affects an event is that it prevents its continuation by interrupting it.

- (19) *cortar* + [events]
Affected property: continuation of the performance of the event

Another subpattern of [[CAUSE]] *cortar* [[EVENTUALITY]] is instantiated by [[Human | Group | Event]] *cortar* [[Process]]. By itself this pattern represents about 10% of the annotated concordances. *Cortar* in composition with process-denoting themes describes an event that prevents a process in progress from developing any further, as the following examples illustrate.

- (20) La convocatoria electoral cortó el proceso parlamentario.
the call electoral cut the process parliamentary
'The call for elections interrupted the parliamentary process.' [*El País Corpus*]

- (21) [...] la venta de la empresa corta el flujo de números rojos.
the sale of the company cuts the flow of numbers red.PL
'The sale of the company brought it out of the red numbers.'
[*El País Corpus*]

Consequently, *cortar* in composition with process-denoting nouns can be schematised as affecting the development of the process.

- (22) *cortar* + [process]
Affected property: development of the process

About 6% of the data corresponds to all kinds of state-denoting themes collected under the pattern [[Human]] *cortar* [[STATE]]. This pattern represents yet another instantiation of [[CAUSE]] *cortar* [[EVENTUALITY]]. Among the nominals that I have classified as referring to states are distinct kinds of relations, as illustrated in example (23), nouns that denote feelings and sensations, as in example (24), as well as states that describe certain qualities as persisting in time, as in example (25).

- (23) [...] liberal ruso que jamás cortó los lazos con el poder central.
liberal Russian who never cut the ties with the power central
'A Russian liberal who never cut his ties with the central power.'
[*El País Corpus*]

- (24) Otro factor que cortó el apetito comprador fue la continua
 another factor that cut the appetite buying was the continuous
 depreciación del dólar ante la moneda japonesa.
 devaluation of the dollar before the currency Japanese
 ‘Another factor that cut the appetite for buying was the continuous de-
 valuation of the dollar against the Japanese currency.’ [El País Corpus]
- (25) [...] el silencio se cortaba a veces por una tos.
 the silence REFL cut.IMP to times by a cough
 ‘The silence was sometimes broken by a cough.’ [El País Corpus]

In the group of states I have also included an oblique use of *cortar* collected under the pattern [[Human]] cortar con [[Human | Group]], as illustrated in the following example.

- (26) Superrealista adscrito al grupo de Paul Eluard y André Bretón,
 surrealist assigned to the group of Paul Eluard and André Bretón
 con el que cortó radicalmente en 1938.
 with he that cut radically in 1938
 ‘A surrealist attributed to the group of Paul Eluard and André Bretón with
 whom he cut off radically in 1938’ [El País Corpus]

This use of *cortar* describes an event where a person or a group distances him/herself sharply from the thinking or the way of doing of another person or group. The meaning that arises is that of breaking a certain kind of relation, which makes this use semantically very much related to the kind of use in (23).

When states are the affected themes of a cutting event, what is conveyed is the ceasing of a state which was likely to last. The semantic schematisation can thus be formulated in the following way:

- (27) *cortar* + [state]
 Affected property: temporal progress of the state

Yet another use of *cortar* that I have classified as an instantiation of eventualities was collected under the pattern [[Human | Group | Event]] cortar [[Time Interval]]. The label [[Time Interval]] includes temporally prolonged events, as in example (28), as well as interactive events, such as the one perfectly described in the noun *racha* ‘series’ in example (29). Often these periods of time are evaluated to be particularly positive or negative, as the following examples also illustrate through an additional predicate: *el mejor moment de su carrera* ‘the best moment of his career’ in example (28) or *racha de derrotas* ‘losing streak’ in (29).

- (28) [...] un jugador de buena técnica al que una lesión cortó el mejor momento de su carrera.
 a player of good technique to whom an injury cut the best moment of his career
 ‘A technically proficient player whose career was cut off at its peak by an injury.’ [El País Corpus]
- (29) El Joventut cortó su racha de derrotas.
 the Joventut cut its series of defeats
 ‘The Joventut basketball team ended its losing streak.’ [El País Corpus]

Thus cutting events affect periods of time that are described by a certain property or an iteration of the same kind of events in that they also affect their temporal continuity, as in the case of states. The schematic characterisation of these kinds of *cortar* events is thus as follows:

- (30) *cortar* + [time interval]
 Affected property: temporal perduration of a time interval that is characterised by some ongoing action or property

All in all, it can be said that cutting affects eventualities in that it prevents any further expected development of that eventuality.

The second major pattern that encompasses other subpatterns affects physical objects. The pattern [[HUMAN | ARTEFACT]] *cortar* [[PHYS OBJ]] represents 22% of the total concordances. A typical example of combinations of *cortar* with physical objects is the following.

- (31) [...] la cinta que cortó el señor ministro era de un amarillo aséptico.
 the ribbon that cut the mister minister was of a yellow aseptic
 ‘The ribbon that the minister cut had a cold yellow colour.’ [El País Corpus]

The most frequent use of *cortar* with physical objects, however, affects body parts. This pattern has been annotated separately from other kinds of physical object themes, since it includes in most of the cases an additional reflexive clitic. Altogether, the subpattern [[Human | Group]] (PRONOUN) *cortar* [[Body Part]] alone represents about 14% of the annotated corpus concordances. The corresponding examples are:

- (32) Menos mal que la Tenaille se corta el pelo.
 less bad that the Tenaille REFL cut the hair

‘Thank goodness that Tenaille gets her hair cut.’ [*El País Corpus*]

- (33) [...] a quien pillan robando le cortan la mano.
to whom catch robbing him cut the hand
‘Whoever they catch stealing, they cut off his hand.’ [*El País Corpus*]

- (34) Una pareja iraní que viajaba con su hijo y otros dos
a couple Iranian who travelling with its son and other two
compatriotas se cortó las venas.
compatriots PRON cut the vein
‘An Iranian couple who was travelling together with their son and two
other compatriots slashed their wrists.’ [*El País Corpus*]

For cutting events with body parts, *cortar* affects the body part physically in different ways. Thus the event described can be an event of trimming as in example (32), an event of complete separation of a body part, as in example (33) or an event of incision into a body part, as in example (34).

Yet another pattern that I have included as an instantiation of physical separation is represented by [[Human]] cortar [[Group]]. This is a use of *cortar* that describes an event of separation of a group of people conceived as a uniform group in some manner, as illustrated in the following example.

- (35) A falta de 30 kilómetros el P.D.M. cortó el pelotón gracias a la
in absence of 30 kilometres the P.D.M cut the peloton thanks to the
sabiduría de Knetemann.
wisdom of Knetemann
‘30 kilometres before the winning post the P.D.M separated the peloton
(in two) thanks to the wisdom of Knetemann.’ [*El País Corpus*]

Thus the schematic representation can be given as follows:

- (36) *cortar* + [physical object]
Affected property: physical integrity of the physical object

Three less representative patterns, each corresponding to only 1% of the data, were also attested in corpora. Despite being not very frequent, I include them here, since they represent yet two other semantic subtypes of *cortar* verb phrases, which further emphasises the verb’s sensitivity to the semantics of its arguments.

On the one hand, *cortar* can combine with a range of objects that stand for the visual field of the observer. These cases were collected under the pattern [[Human | Artefact]] cortar [[Field of vision]] and are typically represented by the following examples:

- (37) [...] se evitará que la visera del estadio corte la perspectiva
SE prevent.FUT that the visor of the stadium cuts the perspective
global del campo.
global of the field
'The stadium awning will be kept from blocking the overall view of the
field.' [El País Corpus]
- (38) Benjamin lo pensó mejor y cortó el plano.
Benjamin it thought better and cut the close-up
'Benjamin rethought it and cut off the close-up.' [El País Corpus]

Cortar verb phrases with theme arguments that describe some kind of field of vision express an event of reduction of the field of vision. Alongside examples (37) and (38) there are other uses where *cortar* is combined with spatially extended figures, of which I, however, found no examples in the corpus explored. These are uses where *cortar* combines with geometric figures such as the path-denoting noun *autopista* 'motorway'.

- (39) Un argayo corta parcialmente la autopista entre Asturias y
a landslide cuts partially the motorway between Asturias and
León.
Leon
'An avalanche partially cuts the motorway between Asturias and Leon.
[<http://www.lne.es/sucesos/2009/02/03/argayo-corta-parcialmente-autopista-asturias-leon/722461.html>]

In examples (37) through (39), *cortar* combines with spatially extended figures such as a field of vision, a close-up image in a film, or a path-shaping element such as a motorway. These combinations give rise to a static predication that describes the delimitation of a territory rather than describing a temporal event, a discussion that lies outside the scope of this work.² For the schematisation, it is clear, however, that what is affected in these cases is the geometrical extension of some entity.

- (40) *cortar* + [spatially extended figure]
Affected property: geometrical extension

Yet another interesting sense emerges when *cortar* selects for organic substances,

²The interested reader should turn to Jackendoff (1996) and Gawron (2009) for a precise explanation of how change of state verbs can receive an extent reading. Here I substantially support the analysis suggested by Gawron (2009), according to which extent readings are available to predicates that can describe motion along an axis and are thus associated with a semantic notion of path.

as in examples (41) and (42).

- (41) [...] se comprobará cómo se corta la mahonesa.
REFL verify.FUT how REFL cut the mayonnaise
'You will see how the mayonnaise separates.' [*El País Corpus*]
- (42) [...] estos organismos provocan el que la leche se corte pasadas
these organisms provoke the that the milk REFL cut past
48 horas desde su salida de la central.
48 hours since its exit of the central
'These organisms cause the milk to sour 48 hours after leaving the dairy.'
[*El País Corpus*]

These cases appear most frequently in the anticausative variant collected in pattern [[Food]] REFL cortar and denote an event where a substance loses its homogeneity in such a way that lumps begin to form in it. Thus, in a schematic way, the combination with substances can be represented in the following way:

- (43) *cortar* + [substance₁]
Affected property: homogeneity of the substance

Finally, a much underrepresented use in the corpus, but one that is still interesting to consider from a semantic point of view, is related to the event of 'cutting' substances. Collected under the pattern [[Human | Substance]] cortar [[Substance]], it denotes events where a substance or a liquid is mixed with another to reduce its consistency or its purity, as the following example illustrates.

- (44) La droga, de una pureza de 90%, está valorada en casi 8.000
the drug of a purity of 90% is esteemed in almost 8.000
millones de pesetas, aunque una vez cortada y en la calle podría
millions of pesetas although on time cut and in the street could
llegar a multiplicar por tres su valor.
reach to multiply per three its value
'The drug, which is 90% pure, has a value of almost 8000 million pesetas,
though once mixed with other substances and out on the street its value
could be three times higher.' [*El País Corpus*]

Schematising the generalisation for this use yields the following:

- (45) *cortar* + [substance₂]
Affected property: reduction of intensity or purity of the substance

This use in particular has even led to a nominalisation that denotes a certain kind of coffee drink. Thus a coffee mixed with a bit of milk is called *cortado* 'cut' in

Spanish.

All these examples contribute to reaffirming that the semantic shifts attested for distinct *cortar* verb phrases are very fine and truly depend on the semantic properties of the theme. The strong differences amongst the themes *cortar* combines with also strongly influence the resulting meaning of the verb phrase. Furthermore, this collection of corpus data illustrates that, in contrast to *congelar* ‘freeze’, *cortar* has semantically a much wider range of possible theme arguments. Contrasted with *romper*, in turn, *cortar* triggers many more coercions.

In the following section, I explore the morphosyntactic alternation possibilities of *cut* phrases and how the semantics of the distinct possible themes provokes some restrictions on argument realisation.

7.2 Syntactico-semantic alternations with *cortar*

Corpus data reveal four basic patterns *cortar* can appear in: 1) a causative-anticausative alternation, 2) a transitive and agentive use, 3) a pronominal causative use and 4) a use with an oblique argument. Within these coarse-grained patterns different semantically distinct patterns have to be distinguished. As I proceed, it will become clear that the patterns convey slightly different overall meanings of the cutting event and that they are associated with syntactic realisation restrictions.

7.2.1 The causative-anticausative alternation

Contrary to what has often been claimed in the literature about *cut* and *cortar*, the causative-anticausative alternation of *cortar* is regularly attested in the corpus for certain semantic classes of themes. Specifically, the causative-anticausative alternation is most frequent for *cortar* when it combines with process-denoting nouns, as in examples (46) and (47).

- (46) Etxegarai no tuvo tiempo de aportar más precisiones, ya que
Etxegarai no have time of contribute more clarifications already that
se cortó la comunicación enseguida.
REFL cut the communication at once
‘Etxegarai did not have time to contribute any more clarifications, since
the communication was immediately cut off.’ [*El País Corpus*]
- (47) Luis de Benito terminaba de leer una noticia cuando el programa
Luis de Benito finish.IMP of read a news when the programme
se cortó [...]
REFL cut

‘Luis de Benito was just finishing reading a headline when the programme was interrupted.’

Within the class of eventuality-denoting themes, the alternation is regular for several subgroups. The supply of natural phenomena understood in terms of a continuous stream, such as *gas*, *electricidad* ‘electricity’, etc. quite naturally appear in the anticausative.

- (48) Poco después se cortó la corriente eléctrica (por sí sola), e
little later REFL cut the current electric (by self alone) and
intérpretes y espectadores quedaron congelados en la oscuridad.
performers and spectators remained frozen in the darkness
‘Shortly afterwards, the power failed, and both performers and spectators
remained frozen in place in the dark.’ [*El País Corpus*]

The anticausative variant is also natural for appliances and artefacts, which stand in for particular events that imply these appliances and artefacts.

- (49) Se cortó el teléfono.
REFL cut the phone
‘The phone got cut off.’ [*El País Corpus*]

Furthermore, food-denoting nouns also naturally combine with *cortar* in the anticausative, particularly if it is a liquid or a substance, as illustrated in the following examples.

- (50) [...] se comprobará cómo se corta la mahonesa.
REFL verify.FUT how REFL cut the mayonnaise
‘You will see how the mayonnaise separates.’ [*El País Corpus*]
- (51) [...] la leche se corta pasadas 48 horas desde su salida de la
the milk REFL cuts past 48 hours since its exit of the
central.
central
‘The milk sours 48 hours after leaving the dairy.’ [*El País Corpus*]

The causative-anticausative variant can even appear with other physical object themes, a fact rarely acknowledged, as also pointed out by Rappaport Hovav and Levin (2010).

- (52) Se le cortó la cuerda cuando hacía bungee.
REFL to him cut the rope while doing.3.SG bungee
‘The rope broke while he was bungee jumping.’

[Web³]

Finally, *cortar* in composition with time intervals denoting themes can also appear in the anticausative pattern.

- (53) Se cortó la mala racha de cuatro derrotas consecutivas.
REFL cut the bad series of four defeats consecutive
'The bad spate of four consecutive defeats has ended.'
[<http://www.elchediario.com/display.aspx?id=12772>]

All these anticausative variants together describe events that can arise from within the entity denoted by the unique argument.

The fact that *cortar* allows for the anticausative has, however, hardly ever been acknowledged in the linguistic literature. For a long time, studies of English verbs have claimed that verbs fall into two major classes, first acknowledged by Fillmore (1967). Thus the *break*-class verbs were generally claimed to participate in the causative-anticausative alternation, while the *hit*-class verbs were observed not to participate in this alternation. The following examples adapted from Fillmore (1967, p. 122-123) clearly illustrate this contrast:

- (54) a. John broke the stick.
b. The stick broke.
(55) a. Johan hit the tree.
b. #The tree hit.

English *cut* has been generally attributed to the second class and claimed to lack the anticausative variant (Guerssel et al., 1985; Haspelmath, 1993; Bohnemeyer, 2007), as illustrated in example (56), taken from Haspelmath (1993, p. 93):

- (56) a. The tailor cut the cloth.
b. #The cloth cut.

The same distinction could, in principle, be applied for Spanish *cortar*, based on similar examples.

- (57) a. El sastre cortó la tela.
the tailor cut the cloth
'The tailor cut the cloth.'
b. ??La tela se cortó.
the cloth REFL cut
'The cloth cut.'

³<http://www.larazon.com.ar/interesa/corto-cuerda-bungee0312600074.html>

The initially observed lack of the anticausative variant for *cut* (Levin, 1993) led researchers to claim that this verb has agent-oriented meaning components, such as, for example, the necessity of specifying an instrument used, as defended by Koenig et al. (2008). Thus, given that the anticausative implies the absence of an agent, *cut* was claimed not to appear in the anticausative variant (Haspelmath, 1993, p. 93). Most prominently, Levin and Rappaport Hovav (1995, 103) have argued that what blocks *cut* from producing a morphologically related anticausative form is the impossibility of referring somehow to the instrument without actually expressing the cause. Consequently, *cut* has been claimed to be a manner verb, which typically lack the anticausative (Levin, 1993).

Even more generally, Guerssel et al. (1985), but also Hale and Keyser (1986) have argued that the syntactic differences between *break*-type and *cut*-type verbs, displayed in examples (54) and (55), actually derive from their lexical conceptual structure. This is to say, their internal semantic representations have a direct effect on the possible argument structure changing operations. To capture this insight Guerssel et al. (1985) proposed the following lexical conceptual representation for the verbs *cut* and *break*:

(58) *cut* LCS: x produce CUT on y, by sharp edge coming into contact with y.
(Guerssel et al., 1985, p. 51)

(59) *break* LCS: y comes to be BROKEN
(Guerssel et al., 1985, p. 54)

What these Lexical Conceptual Structures represent is that *cut* denotes an event that involves two participants, while *break* denotes an event that necessarily involves only one participant. Intuitively, these suggestions makes sense, if we consider that the event of cutting is usually described as producing an incision with a clean-edged instrument. The manipulation of an instrument almost always involves the intervention of an agent. This kind of analysis equally applies to many Spanish *cortar* examples, as illustrated in the following examples, and as will be further discussed in section 7.2.2.

(60) a. El campesino [...] cortó un melón.
the peasant cut a melon
'The peasant cut a melon.' [*El País Corpus*]

b. #El melón se cortó por sí solo.
the melon REFL cut by self alone
'The melon cut by itself.'

(61) a. [...] Sergio Ruiz cortó la tarta nupcial [...]
Sergio Ruiz cut the cake nuptial
'Sergio Ruiz cut the wedding cake.' [*El País Corpus*]

- b. #La tarta nupcial se cortó por sí sola.
 the cake nuptial REFL cut by self alone
 ‘The wedding cake cut by itself.’

Against received wisdom, however, Bohnermeyer (2007) as well as Rappaport Hovav and Levin (2010) defend that on closer examination of cutting events it turns out that *cut* does not specify either the instrument or the event the instrument is involved in. In that respect, Bohnermeyer (2007, p. 159) argues the following:

Cut verbs, too, are rather flexible about the action performed and the instrument used (I can cut an orange using anything from a knife or axe to a metal string or laser beam, and I can do it by bringing the blade to bear on the fruit or by dropping the fruit onto the blade from sufficient height).

What emerges from this research is thus that *cut* actually supports a wide range of actions performed by the agent. If *cut*, however, does not specify any manner by which the action is brought about, this then hints at considering it as a possible result verb that would be expected to actually appear in the anticausative variant (Levin and Rappaport Hovav, 2013). And in fact, as laid out above, corpus data on the Spanish equivalent *cortar* provides plenty of evidence for cutting events appearing in the anticausative form, as illustrated in the following examples, of which the second is repeated from (25) above:

- (62) Ayer, a las nueve de la noche, la emisión del Telediario 2
 yesterday a the nine of the night the emission of the TV news 2
 se cortó inesperadamente.
 REFL cut unexpectedly
 ‘Yesterday, at 9 pm, the Channel 2 news broadcast was unexpectedly cut off.’ [*El País Corpus*]
- (63) [...] el silencio se cortaba a veces por una tos.
 the silence REFL cut at occasions through a cough
 ‘The silence was sometimes broken by a cough.’ [*El País Corpus*]
- (64) [...] a las 23.30 horas se cortó el gas.
 a the 23.30 hours REFL cut the gas
 ‘At 23.30 the gas went off.’ [*El País Corpus*]
- (65) Se cortó el teléfono.
 REFL cut the phone.
 ‘The line went dead.’ [*El País Corpus*]

These data facts show that Spanish *cortar* in its syntactic behaviour does not differ so much from Spanish *romper* ‘break’, on contrast to what has been defended

for their English equivalents *cut* and *break* (Smith, 1970; Levin, 1993). Much to the contrary, Rodríguez Arrizabalaga (2003, p. 132-133) has argued that Spanish *cortar* ‘cut’ and Spanish *romper* ‘break’ should not be split up into two classes of verbs, since they actually show the same syntactic alternations.⁴ Thus in Spanish there is no cognitive alternation. Most importantly of all, however, both verbs appear in the causative-anticausative alternation, which is typically used as a diagnostics for verbs that encode result (Rappaport Hovav and Levin, 2010; Levin and Rappaport Hovav, 2013, 2014). Consequently, I agree with Rodríguez Arrizabalaga (2003) that both *romper* and *cortar* represent real members of the change of state verb class.

The fact that Spanish *cortar*, against received wisdom, actually does appear in the anticausative pattern with certain arguments, yet again represents an argument in favour of the defended claim that the conditions that allow for an anticausative use of a verb are not purely lexically determined. More concretely, I take these data to prove that it is at the verb phrase level that argument alternation behaviour is finally determined. That is, *cortar* is available in the anticausative form through the selection of a theme which can undergo cutting without the external involvement of an agent, such as certain kinds of actions, processes and states, as well as substances.

In fact, support for such an account comes also from recent observations made by Levin and Rappaport Hovav (2014). In a detailed analysis of English *clean*, the authors observe that *clean* appears in the anticausative, but that the range of themes found in this alternation is semantically restricted.

The restrictions are actually very fine-grained. In the following subsection I illustrate that, although certain themes that are understood as actions can make *cortar* display an anticausative use, when the action is under the control of an intentional agent the anticausative is not licensed.

7.2.2 The agentive *cortar* patterns

Several uses of *cortar* subcategorise for agents as causers of the event, as will be illustrated in this subsection. At the same time, the agent subcategorisation is strongly related to the lack of an anticausative pattern. Below, I present three major groups of agentive *cortar* uses, which in turn contain several subpatterns.

⁴Future research should show whether this difference in lexicalisation patterns between Spanish and English is related to the fact that Spanish is a verb-framed language, while English is a satellite-framed language.

The general agentive pattern

Several uses of *cortar* are exclusively agentive. The requirement of agent-caused events has often been correlated with the lack of the anticausative variant (Haspelmath, 1993; Levin and Rappaport Hovav, 1995; Koontz-Garboden, 2009). Thus one of the much-cited examples, where cutting events lack the anticausative, is the cake example, repeated from above (61) in example (66). Recall from the previous chapters as well that by adding the idiomatic anaphor *por sí solo/a* the subject of the anticausative is construed as the sole cause of the event under consideration (Chierchia, 2004) and thus identifies the cause and the theme as one unique argument. As mentioned in the previous chapter, this is necessary for Spanish, since there is in fact a possible reading of this example where *se* represents a reflexive passive reading.

- (66) a. [...] Sergio Ruiz cortó la tarta nupcial [...].
Sergio Ruiz cut the cake nuptial
'Sergio Ruiz cut the wedding cake.' [*El País Corpus*]
b. #La tarta nupcial se cortó por sí sola.
the cake nuptial REFL cut by self alone
'The wedding cake cut by itself.'

Food cutting events, though not necessarily involving one particular instrument or a particular manner, as defended by Bohnemeyer (2007, p. 159), do often imply the action of an agent upon the piece of food. That is, these kinds of themes lack any internal properties that could initiate a cutting event. However, as explained in the previous section in example (43), there are uses of *cortar* with particular kinds of food that lack agent-implications and do allow for the anticausative. This applies for distinct kinds of liquids and substances, which are characteristically homogeneous. By the event of cutting, a chemical process takes place and the substance loses its homogeneity, as in example (41), repeated here for convenience as (67).

- (67) [...] se corta la mahonesa (por sí sola).
REFL cut the mayonnaise (by self alone)
'The mayonnaise separates by itself.' [*El País Corpus*]

What emerges from this contrast is that example (66), in contrast to example (67), is strongly associated with handling a specific type of instrument, which in turn naturally triggers an agent. In the use in (67), in contrast, a chemical action suffices to cause the event to happen internally. Consequently, the agent requirement drops out. What becomes clear is that when we refer to food as a piece of food, cutting occurs via an agent, while homogeneous substances do allow for non-

agentive cutting events.

With respect to the class of event-denoting themes, most of the cutting events preclude anticausativisation, as the following b)-examples illustrate. This clearly suggests the need for an agent to cause the event of *cortar*.

- (68) a. Un aficionado [...] cortó la huida de Hernando.
a fan cut the flight of Hernando
'A fan cut off the flight of Hernando.' [*El País Corpus*]
b. #La huida de Hernando se cortó por sí sola.
the flight of Hernando REFL cut by self alone
'The flight of Hernando cut off by itself.'
- (69) a. Francia corta la entrega de etarras.
France cuts the delivery of ETA members
'France stops the extradition of ETA members.' [*El País Corpus*]
b. #La entrega de etarras se corta por sí sola.
the delivery of ETA members REFL cuts by self alone
'The extradition of ETA members stops by itself.'
- (70) a. González cortó los intentos de iniciar un debate.
González cut the attempts to initiate a debate
'González stopped the attempts to initiate a debate.' [*El País Corpus*]
b. #Los intentos de iniciar un debate se cortaron por sí solos.
The attempts to initiate a debate REFL cut by self alone
'The attempts to initiate a debate stopped by themselves.'
- (71) a. Unos 1000 jóvenes [...] cortaron el tráfico de La Rambla.
some 1000 young cut the traffic of La Rambla
'About 1000 young people blocked traffic on La Rambla.'
[*El País Corpus*]
b. #El tráfico de La Rambla se cortó por sí solo.
the traffic of La Rambla REFL cut by self alone
'The traffic on La Rambla blocked itself.'

Among the eventuality-denoting nouns, location-denoting nouns are another group of themes which precludes the anticausative use of *cortar*, as illustrated in (72-b) and (73-b).

- (72) a. La policía cortó los puentes.
the police cut the bridges
'The police cut off the bridges.' [*El País Corpus*]
b. #Los puentes se cortaron por sí solos.
the bridges REFL cut by self alone

'The bridges cut off by themselves.'

- (73) a. [...] 800 personas que cortaron la nacional Madrid-Andalucía
800 persons who cut the national Madrid-Andalusia
'800 people who blocked the Madrid-Andalusia highway'
[*El País Corpus*]
- b. #La nacional Madrid-Andalucía se cortó por sí sola.
the national Madrid-Andalusia REFL cut by self alone
'The Madrid-Andalusia highway blocked itself.'

All these uses of *cortar* with event-denoting nouns or nouns that are understood as events require an agent to make the cutting event interrupt a particular kind of conscious action such as the *huida* 'flight' in example (68), the *entrega* 'delivery' in example (69) or even some kind of event associated with a particular location such as *puente* 'bridge' in (72).

Furthermore, agent-oriented uses of *cortar* are found with state-denoting themes. Thus, when *cortar* takes nouns that denote an established relation, such as *relación* 'relación or *lazo* 'tie', it strictly selects for agents as causes of the event, as illustrated in the following two examples.

- (74) Tarancón fue el eclesiástico más discutido y atacado, pero nunca
Tarancón was the clergyman most discussed and attacked but never
[...] cortó por su parte la relación con ningún grupo religioso.
cut by his part the relation with any group religious
'Tarancón was the most discussed and attacked clergyman, but he never
of his own accord cut off relations with any religious group.'
[*El País Corpus*]
- (75) Arriman cortará todos sus lazos legales y funciones administrativas
Arriman cut.FUT all his ties legal and functions administrative
en Cisjordania.
in West Bank
'Arriman will cut off all his legal ties and administrative functions in the
West Bank.' [*El País Corpus*]

The fact that there are ongoing relations between two parties also implies that any kind of rupture comes along consciously. Consciousness, however, is typically attributed to agents. Consequently, none of the two examples allows for an anticausative use, as illustrated in the following.

- (76) #La relación de Tarancón con ningún grupo religioso se cortó por
 The relation of Tarancón with any group religious REFL cut by
 sí sola.
 self alone
 ‘The relation of Tarancón with any religious group cut off by itself.’
- (77) #Sus lazos legales y funciones administrativas en Cisjordania se
 His ties legal and functions administrative in West Bank REFL
 cortarán por sí solos
 cut.FUT by self alone
 ‘His legal ties and administrative functions in the West Bank will cut off
 by themselves.’

A much more marginal and exclusively agentive use of *cortar* is the combination of *cortar* with humans, human groups and organisations. This use of *cortar* carries a preposition *con*.

- (78) Juan cortó con su pareja.
 Juan cut with his couple
 ‘Juan broke up with his partner.’

Groups and institutions that appear in this combination with *cortar* often represent some kind of ideology or a particular way of thinking, as becomes clear in the following examples.

- (79) [...] el régimen comunista chino cortó con el Vaticano
 the regime communist Chinese cut with the Vatican
 ‘The Chinese communist regime cut ties with the Vatican.’ [Web]
- (80) Superrealista adscrito al grupo de Paul Eluard y André Bretón,
 surrealist assigned to the group of Paul Eluard and André Bretón,
 con el que cortó radicalmente en 1938.
 with he that cut radically in 1938
 ‘A surrealist belonging to the group of Paul Eluard and André Bretón,
 with which he made a radical break in 1938.’ [El País Corpus]

Given the use of the prepositional phrase, the question of an causative-anticausative alternation does not even arise. Yet this pattern is purely agentive, since only humans and groups of humans can break their relations with other humans, ideologies or ways of thinking.

Summing up, the agentive use is predominant for four kinds of theme arguments *cortar* can select for, namely food items, event describing nouns, states as well as groups that perform some kind of actions. Apart from the causative-anticausative alternating pattern and the agentive pattern, *cortar* also quite fre-

quently appears in a reflexive use, as I specify below.

The reflexive object use

When *cortar* takes a body-part object possessed by the subject of the verb, the meaning it describes is a damaging incision into the mentioned body part, as illustrated in (81), or a complete separation of this body part from the rest of the body, as in example (82).

- (81) Una pareja iraní que viajaba con su hijo y otros dos
a couple Iranian who travelling with its son and other two
compatriotas se cortó las venas.
compatriots PRON cut the vein
'An Iranian couple who was travelling together with their son and two
other compatriots slashed their wrists.' [*El País Corpus*]
- (82) Jesse James se cortó el dedo meñique.
Jesse James REFL cut the finger little
'Jesse James cut off his little finger.' [*Web*]⁵

Characteristic of this use is also that it often describes an unintentional event. That is, as observed by Levin (1993, p. 102), in this construction the subject of the verb, although usually taken as an agent, is understood to be performing the action on himself or herself unintentionally, as illustrated in (83). For this reason the subject has often been characterised as an experiencer of the event.

- (83) Pasaba por puertas de vidrio, me cortaba y no me
pass through doors of glass REFL cut.IMP and not REFL
enteraba.
notice.IMP
'I went through glass doors, cut myself and didn't notice it.'
[*El País Corpus*]

It is the ability to use expressions denoting a person to refer to the person's body, as pointed out by Levin (1993, p. 102), that often leads to an ambiguity between an intentional and an unintentional performing of the action on the possessor's body part. This becomes clear when contrasting example (82) from above with (84). While in (84) the subject involuntarily injures himself, in (82) it is not clear whether the subject inflicts an injury on himself voluntarily or not.

⁵http://voces.huffingtonpost.com/2013/05/22/jesse-james-pierde-dedo-menique_n_3322079.html

- (84) Jesse James, el ex de Sandra Bullock, se cortó la parte superior
 Jesse James the ex of Sandra Bullock REFL cut the part superior
 del dedo meñique por accidente mientras manipulaba un serrucho.
 of the finger little by accident while manipulating a handsaw
 ‘Sandra Bullock’s ex, Jesse James, accidentally cut off the top part of his
 little finger while operating a handsaw.’ [Web]⁶

Putting all the gathered data together, namely the distinct argument alternation possibilities as well as the restrictions for certain thematic roles for the subject in dependence on the semantics of the theme, powerfully illustrates that syntactic realisation depends on the semantics of the theme argument. In fact, the theme contributes to establishing a very concrete meaning of the verb phrase, which in turn determines whether a particular event can occur independently of an external cause or if a possible cause is restricted to a particular thematic role.

These fine semantic differences, however, illustrate that argument realisation underlies very fine-grained semantic criteria, as already acknowledged in the previous case studies. Thus a much more flexible type system is required to account for the compositional facts of the data presented.

In the following section, I provide a formalisation of the described selectional behaviour in terms of dependent types which, unlike other accounts, are able to take into consideration more refined data facts.

7.3 Composing *cortar*-VPs with physical objects and events

In the preceding sections I have illustrated that *cortar* can combine with a range of diverse themes. Similarly to the preceding case study, *cortar* selects for physical objects and distinct kinds of eventualities instantiated by states, processes and events. Here again, to account for this variety in selectional behaviour, I provide a fine-grained, dependent type in (85).

- (85) a. CORTAR: IIA:entity.B:cause.CORTAR(B,A), which correspond to a family of functions:
 b. x: phys-obj.y:cause.CORTAR(y,x)
 c. x: eventuality.y:cause.CORTAR(y,x)

The typing in (85) indicates that CORTAR has a dependent type that basically selects for physical objects and eventualities and that in both cases the event can

⁶<http://www.rosario3.com/noticias/enserio/noticias.aspx?idNot=130537>

be caused by a cause. Yet, considering the detailed analysis of combinatorial possibilities above, further typing specification is necessary.

As direct instantiations of the case of physical objects of cutting, there are many food items as well as body parts that undergo the event of physical separation. As mentioned above, a food cutting event generally subcategorises for agents, which will require a special typing restriction. This restriction, however, does not apply to body parts and other physical entities, and thus the typing restriction in (85-b) can be maintained in these cases.

- (86) a. CORTAR: ΠA :phys-obj.B:agent.CORTAR(B,A), which correspond to a family of functions:
b. x: food.y: agent.CORTAR(y,x)
c. x: phys-obj.y: cause.CORTAR(y,x)

The family of functions that lies behind the eventualities type arguments, in turn, is very diverse and needs a closer look. I take states, processes, time intervals and events to be direct instantiations of eventuality-denoting nouns. Many of the nouns included in the event-type class, however, restrict the subject thematic role for agents. It should be emphasised at this point that entities like locations, artefacts, humans and continuous streams are entity-denoting nouns that are actually coerced into eventualities. Consequently, a restriction has to be introduced for the typing when *cortar* combines with these kind of themes.

- (87) a. CORTAR: ΠA :event.B:agent.CORTAR(B,A), which correspond to a family of functions:
b. x: location.y: agent.CORTAR(y,x)
c. x: artefact.y: agent.CORTAR(y,x)
d. x: human.y: agent.CORTAR(y,x)
e. x: consinuous-streem.y:agent.CORTAR(y,x)

As mentioned in the previous chapter, coercion has been argued to have important consequences for the type system. In the system of Asher (2011), coercion involves, in addition to a type presupposition, an additional mapping from a type to some other possible underspecified type. Nevertheless, the question of how to account for coercion in the type system must be left for future research. Here again, I point to the approach taken by Asher (2011, p. 220) as a possible proposal, where the author assumes that the transformation necessary for coercion is licensed by fine-grained functor types in combination with the right type of argument. Under this process, types depend not only on the type of another term but also on the semantic value of the term at play.

In the following section I will analyse the aspectual behaviour of *cortar* when it combines with themes of distinct mereological natures.

7.4 Scalar behaviour of *cortar*-VPs

As mentioned in the previous case studies, the aspectual behaviour of a verb is a basic part of its semantic description. Thus this section is devoted to exploring what kind of scale *cortar* can be associated with and how it performs aspectually in composition with the distinct kinds of themes. What I illustrate is that despite the fact that *cortar* is commonly associated with a trivial scale of change, it can describe more complex events thanks to the contribution of the structure of the theme. The formal definition of the scale encoded by *cortar* and the subsequent formal computation of the scalar structure of *cortar*-VPs are expressed in the form of measure of change functions.

7.4.1 Defining the scale of *cortar*

Once again, I follow here one of the general assumptions made in this work, according to which the class of result verbs, of which *cortar* is a member, has been associated with scales. The aspectual analysis is grounded in the idea that the progress in a particular event implies a change along a scale projected by a property lexicalised in the verb. As in the previous case studies, I analyse *cortar* as encoding a measure of change function for which the standard of comparison involved in the truth conditions of the positive form of the predicate *cortar* equals 1. Below, I provide tests to illustrate that the predicate *cortar* is associated with a lower bound as well as a trivial scale of degrees of change.

Similarly to *romper*, *cortar* ‘cut’ naturally describes inherently non-durative events and patterns together with achievements, as the following telicity diagnostics show.

Cortar easily appears with *en*-adverbials ‘in-adverbials’, as in example (88), but it is much less acceptable with *durante*-adverbials ‘for-adverbials’, (89). This contrast illustrates a lack of duration.

(88) El ministro cortó la cinta en un instante.
the minister cut the ribbon in one instant
‘The minister cut the ribbon in one instant.’

(89) ???El ministro cortó la cinta durante un minuto.
the minister cut the ribbon during one minute
‘The minister cut the ribbon for one minute.’

As is typical for achievements, *cortar* verb phrases lack a measure of duration reading for *en*-adverbials in combination with future tense. The only possible reading refers to the time that elapses before the event takes place. In other words, only an ‘after 5 minutes has passed’ reading is possible.

- (90) El ministro cortará la cinta en 5 minutos.
the minister cut.FUT the ribbon in 5 minutes
'The minister will cut the ribbon in 5 minutes.'

Unlike what happens with typical accomplishments, *cortar* verb phrases are rather strange as complements of the periphrasis *terminar de* 'finish to', which indicates a lack of duration.

- (91) ?El ministro terminó de cortar la cinta.
the minister finished of cut the ribbon
'The minister finished cutting the ribbon.'

The adverb *casi* 'almost' does not convey that the event actually took place, which again shows that there is no duration.

- (92) El ministro casi cortó la cinta.
the minister almost cut the ribbon
'The minister almost cut the ribbon.'
≠ cutting took place

Achievement *cortar* verb phrases do not allow for entailments from progressive to perfect, which shows the lack of a process reading.

- (93) El ministro está cortando la cinta.
The minister is cutting the ribbon
'The minister is cutting the ribbon.'
≠ The minister has cut the ribbon.

These tests show that *cortar* appears in punctual events and that the action of cutting is an aspectual achievement. That means it basically culminates at the same moment as it begins, so that no duration is possible. In scalar terms, this translates into a lower bound for the scale in addition to a reduced set of degrees of the scale. The lower bound implies that there is no degree of being cut immediately before the event of cutting takes place. The triviality of the scale, which is reduced to the values $\{0,1\}$, in turn, conveys that there can simply be no degree of 'being cut' in between the point at which the event begins and the point at which it culminates. For the formalisation in terms of measure of change functions, which measure the difference in the degree to which an object has the property of being cut at the beginning of the event versus the end of that event, the following consequences arise.

Given the triviality of the scale and its lower bound, a *cortar* measure of change function basically has two values: the absence of the property of being cut or the presence of that property. That is, the minimum non-zero value on the

cut-scale is identical to the maximum non-zero value, which makes the standard of comparison of *cortar* always equal to 1. This means that, unlike many other change of state verbs, *cortar* by itself does not project a complex degree-scale of change, a fact that equates *cortar* aspectually with *romper*. *Cortar* thus represents yet another case of a change of state verb that lexicalises a trivial scale.

As already laid out in the case study of *romper*, two theoretical options are available to handle the fact that a change of state verb describes instantaneous changes. One option is to consider a two-value system as non-scalar. In this case the change of state verb class cannot be considered to be scalar across the board, since *cortar* is not straightforwardly scalar. If, however, transitions with two available values are included as scalar, then a *cortar* scale can be considered a trivial case of a lexically encoded scale. Again in this case, I opt for understanding a two-point change as scalar in order to preserve the intuition that verbs of change in general can be associated with scales. Thus, similarly to the *romper* case, the singularity of the *cortar* measure of change function is that by default any minimum non-zero value on the *cut* scale is identical to the maximum non-zero value. In fact, as already mentioned in the *romper* case study, considering the trivially scalar verb *cortar*, scalar or non-scalar is purely a theoretical option.

Interestingly, however, *cortar* can appear in verb phrases that describe gradual and non-gradual events, as illustrated in the following contrasts. Examples (94) and (95) show that *cortar* can affect a theme holistically and lack any duration, as in (94), or rather be durative by affecting the theme by parts, as in (95).

- (94) El ministro cortó la cinta completamente.
 the minister cut the ribbon completely
 ‘The minister cut the ribbon completely.’ [*El País Corpus*]
- (95) Al cabo de cuantas horas habrá cortado completamente la
 to the end of how many hours have.FUT cut completely the
 pieza?
 piece
 ‘After how many hours will he have cut the piece completely?’
 [*El País Corpus*]

The same contrast that applies for the physical domain also holds for the domain of eventualities.

- (96) Los bancos cortaron el crédito (completamente).
 the banks cut the credit completely
 ‘The banks completely stopped granting credit.’ [*El País Corpus*]
- (97) TEPCO cortó parcialmente el suministro por primera vez desde su
 TEPCO cut partially the supply for first time since its

fundación.

foundation

‘TEPCO partially cut off the supply for the first time since its founding.’

[*El País Corpus*]

The interesting observation here is that a verb that is usually associated with a trivial scale of change can appear in verb phrases with a more complex structure and affect a theme partially as well as holistically. In the following section I thus provide a formal illustration of how a complex degree-scales for *cortar*-VPs arises through the part structure of a theme.

7.4.2 Durative *cortar* verb phrases

Telicity tests applied above, in examples (88) through (93), have shown that *cortar* can appear in punctual events. As hinted at above, however, the gradability and durativity of *cortar* verb phrases may vary in relation to the kind of theme selected by *cortar*. In this section, I illustrate that when the theme of *cortar* has a relevant part structure it contributes to licensing *cortar* events to be durative.

In the company of theme arguments with a relevant part structure, *cortar* sentences do have a complex event structure that conveys duration. Thus *cortar* verb phrases can be modified by *durante*-adverbials ‘*for*-adverbials’, as in example (98).

- (98) [...] el realizador cortó, con unas tijeras en pequeños trozos y
the producer cut with some scissors in small parts and
durante tres días, los 35.000 metros de película.
during three days the 35.000 meters of film
‘Over three days the producer cut the 35000 meters of film into small
pieces with scissors.’ [*El País Corpus*]

Cortar verb phrases do show up in the progressive as shown in (99), which thus conveys duration.

- (99) El realizador estuvo cortando los 35.000 metros de película.
the producer was cutting the 35.000 meters of film
‘The producer was cutting the 35.000 meters of film.’

That is, the complex event structure for *cortar*-events seems to take its more articulated scale from the extension of the theme *película* ‘film’ in the above examples. What this reveals, once again, is that verbs associated with a trivial scale, which are usually expected to describe achievement events, can actually also describe

accomplishments, thanks to a complex structure provided by the theme.

This fact about *cortar* is reminiscent of incremental theme verbs. Thus *cortar* seems to appear in gradable verb phrases thanks to its drawing a more articulated scale from its theme arguments.

The same kind of contrast between extent and non-extent themes that affect the complexity of the *cortar*-events, illustrated in the physical domain, also appears in the domain of eventualities, as already illustrated in (96) and (97). and repeated here for convenience.

- (100) Los bancos cortaron el crédito completamente.
the banks cut the credit completely
'The banks stopped granting credit.' [*El País Corpus*]
- (101) TEPCO cortó parcialmente el suministro por primera vez desde su
TEPCO cut partially the supply for first time since its
fundación.
foundation
'TEPCO partially cut off the supply for the first time since its founding.'
[*El País Corpus*]

In example (100), *cortar* describes an achievement that affects the theme holistically, while (101) allows for several readings where *cortar* affects the theme only to a certain extent. The available readings in (101) are basically a distributive reading, where supply affects several recipients, and a proportional reading, where diverse degrees of supplying a service are possible, such as to 100%, to 50%, etc. In contrast, *el crédito* in example (100) only seems to have the reading of 'credit flow', which describes a continuous action with no particularly relevant part structure that could be partially affected by cutting.

Here I only very briefly make a digression into some considerations about the mereological structure of the theme arguments, leaving a deeper investigation for future study. When contrasting the physical domain with the abstract domain, it appears very clearly that physical objects have a well-understood part structure, while abstract entities do not. As a consequence, it is quite easy to imagine how *cortar* affects a particular physical object. In the following example, repeated from above (33), *cortar* describes a complete separation event involving the hand, for which it is clear that the hand is affected holistically.

- (102) [...] a quien pillan robando le cortan la mano
to whom catch robbing him cut the hand
'Whoever they catch stealing, they cut off his hand.' [*El País Corpus*]

In contrast to that, we know very little about the mereological structure of abstract entities, which makes it much harder to determine how *cortar* affects such kinds

of entities. For instance, the following example, repeated from above (25), clearly describes a punctual event, where *cortar* causes the cessation of *silence*. The event of cutting in each case entails a disappearing of the silence for at least a short interval of time, such that *silencio* ‘silence’ is always holistically affected by *cortar*. That means it is very hard to imagine a partial affectedness of *silence*. Even in examples like (103) the silence seems to be affected holistically in such a way that the interpretation is that there are several events of silence, if the silence is cut iteratively, which is what is conveyed by the imperfective tense.

- (103) [...] el silencio se cortaba a veces por una tos
the silence REFL cut.IMP on times through a cough
‘The silence was sometimes broken by a cough.’ [*El País Corpus*]

Nevertheless, it is not clear that *silencio* ‘silence’ should be defined as atomic by default. If we assume that a predicate P(x) is atomic, if there is no proper part of x for which P is true, then *silencio* does not directly result as atomic, since two minutes of silence do actually contain a one minute of silence. Working out the precise mereological characterisation of eventuality-denoting nouns would thus be very desirable but must be left for the future. As for now, the explanation that seems most plausible is that eventualities like *silence*, despite not being intrinsically atomic, are always holistically affected. As I tentatively hinted at in the case study for *romper* in chapter 6, I assume that this is the case because the property of a state like *silencio* that is affected throughout the change of state is its temporal progression. This property seems to holistically hold of a state, despite the fact that *silencio* ‘silence’ might not be purely atomic in nature. It thus appears that the mereological structure of the theme is only relevant to the duration of an event, if the property that changes throughout the event is one that holds individually of all mereological parts. If the property, however, holds holistically of the whole theme, as is the case for *silencio*, then the mereological structure of the theme does not influence the scalar properties of the resulting verb phrase.

Returning to the main thread of the discussion, the observation that is crucial for the present study is that examples (98) through (101) illustrate that despite the general assumption that *cortar* is a verb that describes instantaneous events, it can describe durative events also. These facts together suggest that at the level of the VP, gradability is computed from both the scalar structure encoded in the verb as well as the mereological structure of the theme.

Summing up the findings characterising *cortar*, the following list of properties can be provided:

In the following section I provide a formalisation of the *cortar* verb phrase.

Table 7.1: Scalar characteristics of *cortar*

Verb	Scale	Durativity
<i>cortar</i>	lower bound	depending on internal structure of the theme

7.4.3 Computing the gradability of *cortar*-VPs

This section formalises the observation that *cortar*-VPs can have variable durativity and gradability and still are essentially telic. I illustrate how the trivial scale encoded in *cortar* behaves in composition with themes of distinct mereological complexity. As in the case study of *romper*, it is shown formally that, given the triviality of the scale of *cortar*, any durativity or gradability of *cortar* verb phrases comes from the complex structure of the theme. The formalism used here again is the approach to incremental themes from Kennedy (2012). In this analysis the part structure of the theme argument encodes its own measure of change function, which helps in determining the gradability of the verb phrase.

The semantic computation of *cortar*-VPs with themes of distinct mereological complexity will be illustrated on the anticausative variant *cortarse*, as in example (104).

- (104) La tela se cortó.
 the fabric REFL cut
 ‘The fabric cut.’

Here again, two major reasons justify the simplified representation that disregards the subject: 1) As observed by Kratzer (2004), only the direct object participates in defining the culmination of the event, which consequently makes the subject irrelevant for the aspectual computation; 2) Syntactically, I assume that the external argument is introduced separately from the verb by voice, as in Kratzer (1996).

Adapting the formalism of Kennedy and Levin (2008), the measure of change function encoded by *cortarse* is given in example (105):

- (105) *cortarse*: $\lambda x \lambda e. \mathbf{cortarse}(x, e)$

According to the analysis of (Kennedy and Levin, 2008, p. 19), a measure of change function encoding verb needs to be type shifted through degree morphology to denote properties of events, which is done by the introduction of a null degree morpheme *pos*.

- (106) *pos*: $\lambda g \lambda x \lambda e. g(x, e) \geq \mathit{stnd}(g)$

The measure of change function g of type $\langle e, \langle \epsilon, d \rangle \rangle$, ϵ being the type of events, combines this way with *pos* and gives as a result a relation between entities and

events:

$$(107) \quad pos(\llbracket cortarse \rrbracket): \lambda x \lambda e. \mathbf{cortarse}(x, e) \geq stnd(\mathbf{cortarse})$$

This relation will hold iff the value of the measure of change function **cortarse** on the pair x and e is greater than or equal to the standard value of the measure of change function. In the case of *cortarse*, the standard is going to always be 1, given its default telicity. **Cortarse** is now ready to combine with its theme argument.

To begin with, I take a theme argument that denotes an eventuality with no relevant internal structure, namely *comunicación*, corresponding to example (46) and repeated here for convenience.

- (108) Etxegarai no tuvo tiempo de aportar más precisiones, ya
 Etxegarai no have time of contribute more clarifications, insomuch
 que se cortó la comunicación enseguida.
 as REFL cut the communication at once
 ‘Etxegarai did not have time to contribute any more clarifications, since
 the communication immediately cut off.’ [*El País Corpus*]

Given the lack of relevant mereological complexity of the eventuality *comunicación*, the composition can be done directly without the need for recourse to the structural complexity of the theme as suggested in Kennedy (2012).

$$(109) \quad cortarse \text{ la comunicación}: (\lambda x \lambda e. \mathbf{cortarse}(x, e) \geq stnd(\mathbf{cortarse}))(\mathbf{c}) = \lambda e. \mathbf{cortarse}(\mathbf{c}, e) \geq stnd(\mathbf{cortarse})$$

After existential closure over the event argument we obtain:

$$(110) \quad cortarse \text{ la comunicación}: \exists e. \mathbf{cortarse}(\mathbf{c}, e) \geq stnd(\mathbf{cortarse})$$

The predicate will be true just in case there is a positive degree of change in the relevant property of communication. As illustrated in section 7.4, lexical information provides that the verb *cortarse* is associated with a two-point, closed scale, which naturally allows only for two degrees, $\{0,1\}$. Consequently, if *cortarse* is associated with a two-point scale, any minimal non-zero degree of the predicate *cortar* d_{0+} is by default equivalent to the maximal degree d_{max} : $d_{0+} = d_{max} = 1$.

In other words, given that the non-null degree of change yielded by the *cortar*-measure of change function is 1, and the theme argument denoted by *comunicación* does not have any relevant part structure, the VP is not gradable in any interesting way. Consequently, the predicate should be instantaneously telic, which is corroborated by the impossibility of adding a proportional modifier like *parcialmente* ‘partially’ in example (111).

- (111) #Ya que se cortó la comunicación parcialmente
 given that REFL cut the communication partially
 ‘Given that the communication cut off partially’

Nevertheless, as illustrated above, there are in fact *cortar*-VPs that are non-trivially gradable. This is the case for verb phrases with theme arguments that have a part structure that can undergo the event of cutting consecutively. To account for this data fact, as illustrated in example (112), it is necessary to access the part structure of the theme.

- (112) El sastre cortó la tela durante 15 minutos hasta que la cortó
 the tailor cut the fabric during 15 minutes until that it cut
 completamente.
 completely
 ‘The tailor cut the fabric for 15 minutes until he had cut it completely.’

This example clearly illustrates that a mereologically complex structure of the theme can act as an event-delimiting argument, by providing a more complex degree structure associated with the entity. In this case, cutting events become effectively durative and gradual, as illustrated by the modifiers ‘durante 15 minutos’ and ‘completamente’.

Here again, the part structure of the theme is made explicit by the incremental **partof**_Δ function that handles incremental readings of DPs (Kennedy, 2012). The individual-denoting DP is combined with a partitive head *part_{inc}* that takes an individual *x* and provides an expression that measures the degree to which a portion of the constitutive part *y* of *x* changes as a result of undergoing a change in an event *e*:

- (113) $part_{inc}: \lambda x \lambda d \lambda y \lambda e. \mathbf{partof}_{\Delta}(x, y, e) \geq d$

Applying (113) to the argument *la tela* ‘the fabric’, this relation will hold if the portion *y* of fabric that has undergone a change as a result of the participation in the event exceeds the degree *d*:

- (114) $part_{inc}(\llbracket la\ tela \rrbracket): \lambda d \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{t}, y, e) \geq d$

According to Kennedy’s analysis, when there is no overt degree phrase to saturate the degree argument of the incremental partitive, an appropriate standard takes over. As already explained in the above case, the degree argument is fixed to an implicit standard provided by the totally closed **partof**_Δ function. This total closure of the function comes from the fact that it measures the degrees to which a quantity of *y* constitutes the entity *x*, and *x* is finite. The options for the appropriate standard are thus only two: a maximum standard and a minimum standard. That

is, the value of d can be either >0 , in the case that a minimal part of the individual x is affected, or 1. This offers the following two possibilities for the $part_{inc}$ function applied to *la tela*, which correspond to examples (116) and (117) respectively.

- (115) a. $part_{inc}(\llbracket la\ tela \rrbracket): \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{t}, y, e) > 0$
 b. $part_{inc}(\llbracket la\ tela \rrbracket): \lambda y \lambda e. \mathbf{partof}_{\Delta}(\mathbf{t}, y, e) = 1$
- (116) La tela se cortó parcialmente.
 the fabric REFL cut partially
 ‘The fabric tore partially.’
- (117) La tela se cortó completamente.
 the fabric REFL cut completely
 ‘The fabric cut completely.’

For the composition of the predicate *cortarse* and $part_{inc} \llbracket la\ tela \rrbracket$, functor-argument application is not possible, given that both have the same type $\langle e, \langle \epsilon, t \rangle \rangle$. Consequently, I combine the denotation of the nominal intersectively with the denotation of *cortarse* via a version of Kratzer’s Event Identification rule (Kratzer, 1996) as follows:

- (118) a. $\lambda y \lambda e [\mathbf{cortarse}(y, e) \geq stnd(\mathbf{cortarse}) \wedge \mathbf{partof}_{\Delta}(\mathbf{t}, y, e) > 0]$
 b. $\lambda y \lambda e [\mathbf{cortarse}(y, e) \geq stnd(\mathbf{cortarse}) \wedge \mathbf{partof}_{\Delta}(\mathbf{c}, y, e) = 1]$

Spelling out the formalisation, it has to be remembered that for the composition **cortarse** brings in a default standard equivalent to 1. Its argument, in turn, can bring in two distinct structures: either an atomic one or an articulated one. Thus *cortarse* in composition with the theme argument has two options.

First, when we apply **cortarse** to some y , which corresponds to a part of the *tela* ‘fabric’, represented in (118-a) with the variable t , and to some event e , the result will be true iff the value of the pair $\langle y, e \rangle$ on the **cortarse** measure of change function equals or exceeds the standard for *cortarse*, which as noted is equal to 1. This means that for each part that undergoes cutting, the cutting of the part is not a gradual event, but the whole VP can be gradable insofar as the predicate holds of successively larger parts of the fabric, parts which can be inherited by the VP as a whole, as illustrated in (118-a). Second, if on the other hand we take (118-b), where 1 is the standard value, we will get a completely non-gradable interpretation for *cortarse la conversación*. This predicate affects the theme holistically, which corresponds to an achievement-like interpretation for the VP *cortarse la conversación*.

The formalisation represented in (118-a) is also valid for examples like (97), repeated here for convenience, where an abstract theme such as *suministro* ‘supply’ can be affected by *cortarse* by parts.

- (119) TEPCO cortó parcialmente el suministro por primera vez desde su
 TEPCO cut partially the supply for first time since its
 fundación.
 foundation
 ‘TEPCO partially cut off the supply for the first time since its founding.’
 [*El País Corpus*]

Conversely, the formalisation in (118-b) equally applies to examples like those in (94) and repeated here for convenience, where a physical entity is affected holistically by the event of cutting.

- (120) El ministro cortó la cinta completamente.
 the minister cut the ribbon completely
 ‘The minister cut the ribbon completely.’ [*El País Corpus*]

Summing up, yet again, the case of *cortar* illustrates that the mereological structure of the theme does in fact have an effect on the resulting durativity and gradability of a verb phrase described by an inherently telic change of state verb. More explicitly, it shows that the simple scale encoded in an achievement verb does not need to determine the overall gradability of the verb phrase, since the theme can contribute to establishing a more complex scale. Once again, this case study also corroborates the previously explored idea that degree structure is not a purely lexical phenomenon, in this case inherited from the verb, but rather is construed at sentence level (Dowty, 1979; Krifka, 1989b; Caudal and Nicolas, 2005).

7.5 Chapter summary

In this case study I have argued that Spanish *cortar* ‘cut’ is a true member of the change of state verb class, since its argument alternation possibilities overlap with the other members of that class, such as *romper* and *congelar*. More precisely, contra the often made argument that *cut* is an agentive activity verb that lexicalises manner, Spanish *cortar* does regularly appear in the anticausative variant. This alternation, however, is restricted to certain kinds of theme arguments which can undergo the change of cutting due to an inanimate internal cause. This occurs prominently with processes, states as well as substances. This fact yet again provides support for one of the main claims made throughout this work, namely that it is not the semantics of the verb alone that determines the argument realisation possibilities.

The detailed case study of *cortar* has further revealed very clearly that *cortar* has a very rich combinatorial capacity. Still, similarly to the previous case studies, this rich combinatorics can basically be attributed to the domains of physical ob-

jects and eventualities. What is special about *cortar*, however, is that it combines with a very rich variety of themes. Unlike the other two verbs, *cortar* combines with this great diversity of themes by virtue of some additional process of coercion by which many entities are understood as eventualities. A proper investigation of the conditions that give rise to the distinct cases of coercion of *cortar*, however, was not feasible at this point and was left for future research. As already touched on in the previous chapter, the question of how to account for coercion in the type system is left for future research. Here again, I point to the approach taken by Asher (2011, p. 220) as a possible proposal, where the author assumes that the transformation necessary for coercion is licensed by fine-grained functor types in combination with the right type of argument. Under this process, the types depend not only on the type of another term but also on the semantic value of the term at play.

When taking into account all the corpus data observed, there is clear evidence for *cortar* being a semantically complex verb for which the meaning variation across syntactic patterns and theme arguments does not seem to be sufficiently accounted for, when defined as a verb that describes ‘a separation of material integrity’. Its meaning is rather more generally related to a kind of cessation.

With respect to the aspectual behaviour of *cortar*, the verb is clearly associated with a lower bound which makes *cortar* events almost instantaneous by default. Similarly to the case of *romper*, *cortar*-VPs can have variable durativity and gradability while they are essentially telic. This variability comes in with a relevant mereological structure of the theme.

Chapter 8

CONCLUSIONS

8.1 Brief summary of the observations of the three case studies

Throughout the case studies, I have explored the meaning and combinatorial capacity of three crucial members of the change of state verb class, namely *congelar* ‘freeze’, *romper* ‘break’ and *cortar* ‘cut’. To guide the analysis, I have addressed three components related to verb meaning, namely the argument selection of each verb, the argument realisation possibilities and the aspectual properties.

As I presented in the three case studies, all three verbs regularly select physical objects and abstract entities as their theme arguments. For the verbs under study here, I have illustrated that the abstract entities selected as themes either directly refer to eventualities or else are coerced into eventualities. For a coarse-grained summary, it can be said that *congelar* selects physical objects that are substances and body parts, while in the domain of eventualities it selects for states, events and processes. For the verb *romper*, the group of physical objects includes every kind of physical entities except liquids, while the set of eventualities includes states, commitments and processes. Finally, *cortar* combines in the physical domain with body parts and substances. In the eventualities domain, *cortar* selects for states, processes, events and time intervals.

Among the findings of the three case studies, several observations about the argument alternation facts have been made. As I have illustrated in each of the case studies, argument alternation possibilities do not depend exclusively on the semantics of the verb, but rather are sensitive to the semantics of the theme argument. I have shown that *congelar* ‘freeze’ does appear in the causative-anticausative alternation, although the causative form is predominant. Concretely, *congelar* has been illustrated not to appear in the anticausative form when combined with states or eventuality-denoting themes, including nominals that do not

inherently denote events such as amounts and artefacts. In these cases, *congelar* restricts its subject to agents, and more specifically, authorities.

The behaviour of *romper* ‘break’ contrasts with *congelar* in that *romper* appears more frequently in the causative-anticausative alternation, which is allowed for physical objects, states and processes. The exception here lies in combinations with arguments that denote commitments. Similarly to *congelar*, in these cases *romper* VPs refer to situations of human-controlled interaction and therefore restrict the choice of subject argument to humans and human-related action.

Finally, *cortar* ‘cut’ was also shown to appear in the causative-anticausative alternation, a fact that has not received much attention in the previous literature. This is regularly the case for Spanish *cortar* when it appears with themes that denote substances, processes, and supplied substances, such as *gas* or *water*. *Cortar* does not appear in the anticausative for events and entities that are coerced into events such as locations.

Furthermore, Spanish *romper* and *cortar* have been argued to represent verbs that lexicalise result. I have thus argued that Spanish *cortar*, as well as English *cut* (Levin and Rappaport Hovav, 2013), basically encodes result and is a true member of the change of state verb class.

A tentative regularity that seems to emerge from the three case studies, and which will have to be investigated more deeply in future, is that the kind of themes I have classified as events seem to be human-controlled and therefore mostly preclude the anticausative. This contrasts with the kind of nouns classified as states and processes, which do allow for the anticausative. The different semantic properties of the themes that combine with the three CoS verbs under study can thus be clearly stated to determine their argument realisation possibilities.

Turning to the semantic content of the analysed verbs, Spanish *romper* and *cortar* seem to have closely related meanings in that they describe events of separation or division of entities, while they refer to events of cessation when applied to eventuality-denoting themes. One semantic element that underlies both predicates is that they affect entities as well as eventualities which can be judged to be connected in their normal state or development. The idea of connectedness of an entity has been associated with a continuous path between every part of the object (Viberg, 2007) and can equally well be applied to the domain of eventualities. This is why both *romper* and *cortar* seem so similar when they affect objects and events. When physical objects are affected by one of these predicates, the event describes a bringing about of some state of disruption of physical integrity. When eventualities such as states and processes are affected, the disconnection occurs at the level of temporal connectedness in the expected development.

The contrasting semantic element is that *romper* tends to be regarded as an event that brings about an uncontrolled kind of disconnection. *Cortar*, in contrast, describes a more controlled event of disconnection, as has been extensively

argued by Majid et al. (2008). In the physical domain, the fact that the event of disconnection comes about in a controlled manner is often associated with the use of an instrument and the presupposition of an agent. When *cortar* appears in events with prolonged duration, it has a more clearly predictable trajectory than *romper* events. The reason is that cutting is relatively smooth and straight, which at a physical level requires an instrument and thus results in the description of a more controlled action that makes the trajectory of change predictable. The predictability of the trajectory of change, in turn, seems to evoke a clearer notion of incrementality, while a less predictable location of impact, as in the case of *romper*, is associated with a less clear incremental event. I associate this predictable incrementality with the fact that cutting events, in contrast to breaking events, convey more manner than result meaning.

For *congelar* ‘freeze’, the relevant semantic component crosscutting all its themes is the idea of movement. No matter whether *congelar* applies to physical objects, like food items, liquids and other substances, or to the domain of eventualities, such as states or processes, all of these are understood in terms of movement or susceptible change. The event *congelar* thus affects its theme by paralysing any possible change.

Regarding the aspectual behaviour of the analysed verbs, I have illustrated that the default scale associated with a particular change of state verb does not necessarily define the aspectual property of the verb phrase formed by this verb. *Congelar*, for instance, is naturally associated with durative and gradable events. In composition with eventualities, however, it mostly describes punctual events.

Romper and *cortar*, given their lower bound, are naturally associated with achievements. Nevertheless, they can appear in descriptions of gradable events when the structure of their themes is complex. The default behaviour for *romper* is that it describes punctual events, both for the domain of affected physical objects and events. In many cases, however, the structure of a physical object can be made explicit and affect the gradability of a *romper* event. In contrast to the domain of physical objects, it is much harder to conceive of a part structure of eventualities that seems relevant to a *romper* event, and this is the reason why eventualities in composition with *romper* describe punctual events by default. *Cortar*, in turn, quite easily appears in gradable and durative events, when combined with physical objects that provide a relevant mereological structure. For the domain of eventualities, it also does appear in gradable events, although the relevant reading seems to be a distributional one rather than a durative one.

These observations together illustrate that, despite the default telicity of *congelar*, *romper* and *cortar*, the events they describe can vary in duration and gradability, which is due to the effect on the event of the possible mereological structure of the theme. To account for the fact that the structure of the theme can influence the gradability and durativity of the CoS events studied here, I have adapted the

analysis of incremental DP-readings by Kennedy (2012), illustrating in each case study how the computation should proceed for the themes that I have identified as mereologically relevant to the event. For the moment, I have only pointed out some tendencies as to when the mereological structure of a theme, particularly those denoting events, seems to be relevant to a CoS event or not. Future research on the mereological structure of abstract themes should determine whether these tendencies hold consistently or whether the mereological structure of an event-denoting noun may interact differently with each CoS verb. The overall observation that emerges from the present study, however, is that the aspectual properties of the verbs are not necessarily predictive of the aspectual properties in the formation of larger units.

All the facts about argument selection possibilities, how they influence argument realisation possibilities and the differences in duration and gradation that depend on the structure of the theme clearly illustrate that the semantics of a VP strongly depends on the semantics of the theme. This observation thus calls for a mechanism that allows the theme to influence the meaning of the verb phrase in various respects.

8.2 Implications of the study

The exploration of a vast sample of naturally occurring data has allowed for a deep analysis of the change of state verb class in Spanish. Building on corpus data on three Spanish CoS verbs (*congelar*, *romper*, *cortar*), this dissertation has shown that change of state verbs do not restrict their arguments to the domain of physical objects. The distinct combinatorial possibilities of CoS verbs have been further illustrated to have strong effects on argument alternation as well as aspectual behaviour. Crucially, however, they affect predication. All these facts confirm that CoS verbs and their theme arguments do not interact semantically in a trivial way.

I have thus shown that we need to understand verb meaning in a more under-specified way that allows for a division of labour between the semantics of the verb and the semantics of the theme when establishing the meaning of CoS verb phrases. To account for this broad combinatorial capacity, I have suggested treating transitive CoS verbs as dependent types that name a function from arguments to predicates. As a direct consequence, which arguments are inserted into the predicate-argument structures determines what predicate the function yields.

Most prominently, however, I have illustrated that the overwhelming variety of eventuality-denoting arguments selected by the three CoS verbs under study here can actually be reduced to a small number of semantic groups. In this way, the crucial question concerning the wide combinatorial capacity of verbs has been

answered by extending the selectional restrictions to the domain of eventualities and formulating some concrete constraints in each case.

These findings are significant in three ways: Firstly, it has been shown that selectional restrictions of verbs are more flexible than usually acknowledged and commonly addressed in theoretical linguistics studies. Secondly, the fact that over 200 distinct selecting contexts for each verb have been reduced to a small semantic group of selection restrictions illustrates that, despite the wide combinatorial variety of CoS verbs, combinations are actually well constrained. Thirdly, the systematic isolation of groups of arguments that the three change of state verbs can combine with has made more transparent a whole range of data that has often been attributed to a miscellaneous collection of metaphors, idioms, collocations and non-compositional meaning.

Given that the thorough analysis of the three verbs was actually preceded by a long process of annotation of 28 Spanish CoS verbs, I can confidently affirm that the remaining verbs equally compose with eventualities. Consequently, I assume that the analysis developed for *congelar* 'freeze', *romper* 'break' and *cortar* 'cut' can be carried over in a similar way to other change of state verbs. In other words, for other Spanish CoS verbs the combinatorial variation also has effects on argument alternation and aspectual behaviour, which should be possible to analyse in a similar way as the case studies presented in this dissertation.

All these data, under the thorough analysis of the three major aspects of lexical meaning, have led to two important insights. On the one hand, it has been shown that understanding the meaning of a verb phrase involves taking into account the semantics of the verb and its arguments and that different types of themes have as an effect that the VP imposes different kinds of conditions on its subject and can have different scalar properties. On the other hand, considering meaning variation as a consequence of distinct combinatorial patterns has revealed meaning variation of change of state verbs as a regular process. The general position I have thus defended throughout this work has been that within the distinct combinatorial patterns the verb does not change its meaning, but rather interacts with its arguments; this is the level where compositional meaning shifts arise. This is the reason why the verb's arguments so decisively contribute to establishing the semantics of the verb phrase.

To provide an overall picture of the work conducted in this study, it can be said that, starting with the observation that transitive verbs express a wide range of predicates depending on the choice of the direct object, this work has undertaken the enterprise to bring together ideas from distinct linguistic disciplines such as corpus linguistics, lexicology, lexical semantics and compositional theories, in order to bring the analysis of these data a step further than has been done until the present. Employing a well-defined corpus annotation methodology used in lexicography has allowed for the systematic tracking of argument selection pref-

erences of CoS verbs. These annotated data have then been analysed against well-defined theoretical linguistic research on verbal semantics, argument alternation and aspectual behaviour of verbs. The findings about meaning shifts and differences in argument alternation have finally been addressed as a problem of composition. The formal account of the combinatorial capacity of CoS verbs has been situated solidly within modern type theories.

As pointed out by Asher (2011, p. ix), the ‘idea that there are non-trivial semantic interactions between words that affect the content of a predication is intuitive and perhaps obvious. But working out a precise theory, or even an imprecise one, of this phenomenon is difficult.’

8.3 New research directions

The present study has raised a number of interesting issues to be addressed in future research, some of which I want to briefly mention here.

Throughout the corpus annotation work on verbs, a crucial difficulty was the appropriate semantic labelling of abstract nouns. The problems encountered are due to a considerable lack of research on abstract nouns. From the side of computational linguistics, available resources, such as WordNet, are mainly based on lexicographic definitions of nouns. The present study emphasises that such a representation of nouns is not sufficient to account for what happens to the semantics of nouns when they combine with predicates. Theoretical linguistics, in contrast, has mainly focused on deverbal abstract nouns, given that these can be correlated with the aspectual properties of verbs, of which linguists have come to have a fairly good understanding. That means that, overall, the corpus of research on abstract nouns is still considerably small and did not provide sufficient information on the semantics of abstract nouns that I was confronted with throughout this study. Two major issues remain to be addressed by future research.

On the one hand, the analysis of distinct verbs has illustrated that it is difficult to provide a consistent classification of abstract nouns. In several cases different verbs combine with the same abstract noun which, however, could be classified differently, as shown in the contrast between examples (1) and (2).

- (1) Ricky Martin rompió su relación sentimental.
Ricky Martin broke his relation sentimental
‘Ricky Martin broke off his relationship.’ [*El País Corpus*]
- (2) Este país congeló relaciones con el gobierno de Londres.
this country froze relations with the government of London
‘This country froze relations with the government of London.’
[*El País Corpus*]

While in example (1) *relación* clearly has a static nature, in example (2) it seems to describe a process. The fact that *relación* is used in the plural in example (2) certainly contributes a reading of iteration which makes the sentence acquire a distinct aspectual nature. Nevertheless, as far as I know, such observations have not been addressed in a systematic way. My study thus clearly points to the need for more systematic research on abstract nouns and particularly non-deverbal abstract nouns. More concretely, a question that seems to emerge is whether abstract nouns have different aspectual natures in different contexts.

On the other hand, what also needs to be addressed more consistently is the mereological nature of abstract nouns and how it interacts with the structure of the event on a whole. In this respect, interesting observations have emerged from the case study of *congelar* ‘freeze’ in chapter 5. There, I have illustrated that eventuality-denoting themes, like *conversaciones* ‘conversations’, which we naturally expect to possess a complex mereological structure, in composition with *congelar* yield non-durative *congelar* verb phrases, as in the following example.

- (3) #El partido congeló estas conversaciones durante 5 días.
the party froze these conversations during 5 days
‘The party froze these conversations for 5 days.’
Intended reading: the process of freezing took 5 days

This means that a complex mereological structure of an abstract noun, such as *conversaciones* ‘conversations’, does not directly correlate with the structure of a CoS event. At this point I would like to advance the tentative stipulation that the abstract nouns that CoS verbs combine with mainly denote eventualities and that the only relevant property that can be affected by a CoS event is their persistence in time. This would suggest that the semantic nature of these abstract nouns is very crucially based on time.

In addition, though not something I have been able address in more detail, the present work has emphasised the importance of further research on alternative compositional operations such as coercion. The present detailed corpus study has provided a lot of data that illustrate that change of state predicates, such as *congelar* ‘freeze’ and *cortar* ‘cut’, actually very frequently make use of coercions, a property more typically attributed to verbs like *enjoy* or *begin*. Studying the distinct verbs one by one has shown that the coercive capacity of CoS verbs is not uniform. While *congelar* and *cortar* appear with many coerced arguments, *romper* occurs with fewer coercions. Future research should thus address not only what the exact conditions for coercion are but also why some verbs within the CoS verb class, such as *congelar* and *cortar*, are more strongly coercing than other verbs, such as *romper*. This observation leads to the question of whether the semantic specificity of verbs limits the variety of distinct theme arguments a verb

can combine with.

Based on insights from corpus data, I would like to advance the tentative observation that there seems to be a correlation between the variety of combinatorial possibilities of a verb and the number of coerced arguments it takes. Verbs that seem to have a more vague semantic content, like *romper* 'break', analysed here, as well as *abrir* 'open' and *cerrar* 'close', are verbs that allow for a greater variety of arguments. At the same time, they appear with fewer coerced arguments. Semantically more specific verbs, such as *congelar* 'freeze', *cortar* 'cut' or *fracturar* 'fracture', in contrast, permit a more restricted range of combinations but allow for more coerced arguments. It appears, then, as suggested by Asher (2011, p. 219), that the panorama of coercion is very much a matter of the verb's fine-grained meaning.

Last but not least, what also seems to emerge from all the case studies is that when theme arguments are coerced by *congelar*, *romper* and *cortar*, the resulting verb phrases restrict their subjects to humans or human-related action. Future research should thus also question whether coercion specifically accompanies events belonging to the world of humans actions, rather than, for example, natural phenomena.

Bibliography

- Abusch, Dorit. 1986. Verbs of change, causation and time. *CSLI Publications Technical Report CSLI*.
- Alexiadou, Artemis, Elena Anagnostopoulou, and Florian Schäfer. 2006. The properties of anti-causatives crosslinguistically. In *Phases of Interpretation*, ed. M. Frascarelli, 187–211. Berlin: Mouton de Gruyter.
- Alonso Ramos, Margarita. 2011. Sobre los usos figurados - extensiones de una única definición? In *60 Problemas de Gramática Dedicados a Ignacio Bosque*, ed. M. Victoria Escandell Vidal, Manuel Leonetti Jungl, and Cristina Sánchez López, 340–346. Tres Cantos: AKAL.
- Apresjan, Juri. 1973. Regular Polysemy. *Linguistics* 142:5–32.
- Asher, Nicholas. 2011. *Lexical Meaning in Context*. Cambridge: Cambridge University Press.
- Asher, Nicholas, and James Pustejovsky. 2013. A type composition logic for generative lexicon. In *Advances in Generative Lexicon Theory*, ed. James Pustejovsky, Pierrette Bouillon, Hitoshi Isahara, Kyoko Kanzaki, and Chungmin Lee, volume 46 of *Text, Speech and Language Technology*, 39–66. Springer Netherlands. URL http://dx.doi.org/10.1007/978-94-007-5189-7_3.
- Atkins, Beryl T., Judy Kegl, and Beth Levin. 1988. Anatomy of a verb entry: From linguistic theory to lexicographic practice. *International Journal of Lexicography* 1:84–126.
- Beavers, John. 2008. Scalar complexity and the structure of events. In *Event Structures in Linguistic Form and Interpretation*, ed. Johannes Dölling and Tatjana Heyde-Zybatow, 245–265. Berlin: Mouton de Gruyter.
- Beavers, John. 2011. On Affectedness. *Natural Language and Linguistic Theory* 29:335–370.

- Beavers, John. In press. Aspectual classes and scales of change. *Linguistics Special Issue*.
- Bertinetto, Pier Marco, and Mario Squartini. 1995. An attempt at defining the class of ‘gradual completion verbs’. In *Temporal Reference Aspect and Actionality I: Semantic and Syntactic Perspectives*, ed. Pier Marco.
- Bohnenmeyer, Jürgen. 2007. Morpholexical transparency and the argument structure of verbs of cutting and breaking. *Cognitive Linguistics* 18:153–177.
- Bosch, Peter. 1985. Lexical meaning contextualized. In *Meaning and the Lexicon. Proceedings of the 2nd International Colloquium on the Interdisciplinary Study of the Semantics of Natural Language*, ed. G. Hoppenbrouwers, Pieter Seuren, and A. Weijters, 251–258. Dordrecht: Foris.
- Bosque, Ignacio. 2004. *REDES Diccionario combinatorio del Español Contemporáneo*. Madrid: Ediciones SM.
- Brosseau, Anne-Marie, and Elizabeth Ritter. 1991. A non-unified analysis of agentive verbs. In *The Proceedings of the 10th West Coast Conference on Formal Linguistics*, ed. Dawn Bates, 53–64. Stanford: CSLI Publications.
- Carrera, Jordi, Irene Castellón, Salvador Climent, and Marta Coll-Florit. 2008. Towards Spanish verbs’ selectional preferences automatic acquisition. Semantic annotation of the SenSem corpus. In *Proceedings of the 6th Language Resources and Evaluation Conference*, ed. Nicoletta Calzolari et al., 2397–2402. European Language Resources Association (ELRA). URL <http://www.lrec-conf.org/proceedings/lrec2008/>.
- Caudal, Patrick, and David Nicolas. 2005. Types of degrees and types of event structure. In *Event Arguments: Foundations and Applications*, ed. Claudia Maienborn and Angelika Wöllstein, 277–299. Tübingen: Niemeyer.
- Chatzikyriakidis, Stergios, and Zhaohui Luo. 2013. Adjectives in a modern type-theoretical setting. *Lecture Notes in Computer Science* 8036:159–174.
- Chierchia, Gennaro. 2004. A semantics of unaccusatives and its syntactic consequences. In *The Unaccusative Puzzle*, ed. Artemis Alexiadou, Elena Anagnostopoulou, and Martin Everaert, 22–59. Oxford: Oxford University Press.
- Ciaramita, Massimiliano, and Mark Johnson. 2000. Explaining away ambiguity: Learning verb selectional preference with Bayesian networks. In *Proceedings of the 18th Conference on Computational Linguistics - Volume 1, COLING '00*, 187–193. Stroudsburg, PA, USA: Association for Computational Linguistics. URL <http://dx.doi.org/10.3115/990820.990848>.

- Copestake, Ann, and Ted Briscoe. 1995. Semi-productive polysemy and sense extension. *Journal of Semantics* 12:15–67.
- Dowty, David. 1979. *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Dordrecht: Reidel.
- Dowty, David. 1985. On recent analyses of the semantics of control. *Linguistics and Philosophy* 8:291–331.
- Fernández-Montraveta, Ana, Gloria Vázquez, and Christiane Fellbaum. 2008. The Spanish version of WordNet 3.0. In *Text Resources and Lexical Knowledge*, ed. Angelika Storrer et al., 175–182. Berlin: Mouton de Gruyter.
- Fillmore, Charles. 1967. The grammar of hitting and breaking. In *Readings in English Transformational Grammar*, ed. Jacobs Roderick and Peter Rosenbaum, 120–133. Ginn: Waltham, MA.
- Fillmore, Charles J. 1992. “Corpus linguistics” vs. “computer-aided armchair linguistics”. In *Directions in Corpus Linguistics: Proceedings from a 1991 Nobel Symposium on Corpus Linguistics*, 35–66. Stockholm: Mouton de Gruyter.
- Fodor, Jerry, and Ernie Lepore. 1998. The emptiness of the lexicon: Critical reflections on J. Pustejovsky's Generative Lexicon. *Linguistic Inquiry* 29:269–288.
- Folli, Raffaella, and Heidi Harley. 2004. Consuming results in Italian and English: flavors of v. In *Aspectual Inquiries*, ed. Roumyana Slabakova and Paula Kempchinsky, 95–120. Dordrecht: Kluwer.
- Gawron, Mark. 2009. The lexical semantics of extent verbs. Ms. San Diego State University.
- Guerssel, Mohamed, Kenneth Hale, Mary Laughren, Beth Levin, and Josi White Eagle. 1985. A cross-linguistic study of transitivity alternations. In *Papers from the Parasession on Causatives and Agentivity*, 48–63. Chicago Linguistic Society.
- Hale, Ken, and Samuel Jay Keyser. 1986. A view from the middle. *Lexicon Project Working Papers 10*.
- Hanks, Patrick. 2000. Do word meanings exist? *Computers and the Humanities* 171–177.

- Hanks, Patrick. 2004. The syntagmatics of metaphor and idiom. *International Journal of Lexicography* 17:254–274.
- Hanks, Patrick. 2013. *Lexical Analysis: Norms and Exploitations*. Cambridge, MA: MIT Press.
- Hanks, Patrick, and Elizabetta Jezek. 2008. Shimmering lexical sets. In *Proceedings of the XIII EURALEX International Conference*, ed. Elisenda Bernal and Janet DeCesaris, 391–402. Barcelona: Institut Universitari de Lingüística Aplicada. Universitat Pompeu Fabra.
- Hanks, Patrick, and James Pustejovsky. 2005. A pattern dictionary for natural language processing. *Revue Française de Langue Appliquée* 10:63–82.
- Haspelmath, M. 1993. More on the typology of inchoative-causative verb alternations. In *Causatives and Transitivity*, ed. Bernard Comrie and Maria Polinsky, 87–120. Amsterdam: John Benjamins.
- Hay, Jennifer, Christopher Kennedy, and Beth Levin. 1999. Lexicalized meaning and the internal temporal structure of events. In *Proceedings of Semantics and Linguistic Theory SALT 9*, ed. Tanya Matthews and Devon Strolovitch, 127–144. Ithaca: Cornell Linguistics Circle Publications.
- Horvath, Julia, and Tal Siloni. 2011. Causatives across components. *Natural Language and Linguistic Theory* 30:1–48.
- Jackendoff, Ray. 1996. The proper treatment of measuring out, telicity, and perhaps even quantification in English. *Natural Language and Linguistic Theory* 14:305–354.
- Jespersen, Otto. 1927. *A Modern English Grammar on Historical Principles. Part 3*. Heidelberg: Carl Winter.
- Kearns, Kate. 2003. Durative achievements and individual-level predicates on events. *Linguistics and Philosophy* 26:595–635.
- Kennedy, Christopher. 2012. The composition of incremental change. In *Telicity, Change, State: A Cross-categorial View of Event Structure*, ed. Violeta Demonte and Louise McNally, 103–121. Oxford: Oxford University Press.
- Kennedy, Christopher, and Beth Levin. 2008. Measure of change: The adjectival core of degree achievements. In *Adjectives and Adverbs: Syntax, Semantics, and Discourse*, ed. Louise McNally and Christopher Kennedy, 156–182. Oxford: Oxford University Press.

- Kennedy, Christopher, and Louise McNally. 2005. Scale structure, degree modification, and the semantics of gradable predicates. *Language* 81:345–381.
- Kilgarriff, Adam. 1997. I don't believe in word senses. *Computers and the Humanities* 31:91–113.
- Koenig, Jean-Pierre, Gail Mauner, Breton Bienvenue, and Kathy Conklin. 2008. What with? The anatomy of a (proto)-role. *Journal of Semantics* 25:175–220.
- Koontz-Garboden, Andrew. 2007. States, Changes of State and the Monotonicity Hypothesis. Doctoral Dissertation, Stanford University, Stanford, USA.
- Koontz-Garboden, Andrew. 2009. Anticausativization. *Natural Language and Linguistic Theory* 27:77–138.
- Koontz-Garboden, Andrew. 2012. The monotonicity hypothesis. In *Telicity, Change, State: A Cross-categorial View of Event Structure*, ed. Violeta Demonte and Louise McNally, 139–161. Oxford: Oxford University Press.
- Kratzer, Angelika. 1996. Severing the external argument from the verb. In *Phrase Structure and the Lexicon*, ed. Johan Rooryck and Laurie Zaring, 109–137. Dordrecht: Kluwer.
- Kratzer, Angelika. 2004. Telicity and the meaning of objective case. In *The Syntax of Time*, ed. Jacqueline Guéron and Jacqueline Lecarme, 389–424. Cambridge MA: MIT Press.
- Krifka, Manfred. 1989a. Nominal reference, temporal constitution, and quantification in event semantics. In *Semantics and Contextual Expression*, ed. Renate Bartsch, Johan van Benthem, and Peter van Emde Boas, 75–115. Dordrecht: Foris.
- Krifka, Manfred. 1989b. *Nominalreferenz und Zeitkonstitution. Zur Semantik von Massentermen, Pluraltermen und Aspektklassen*. München: Wilhelm Fink.
- Krifka, Manfred. 1992. Thematic relations as links between nominal reference and temporal constitution. In *Lexical Matters*, ed. Ivan A. Sag and Anna Szabolcsi, 29–54. Stanford: CSLI Publications.
- Krifka, Manfred. 1998. The origins of telicity. In *Events and Grammar*, ed. Susan Rothstein, 197–235. Dordrecht: Kluwer.
- Labelle, Marie, and Edit Doron. 2012. Anticausative derivation and other valency alternations in French. *Probus* 22:303–316.

- Lakoff, George. 1968. Some verbs of change and causation. In *Mathematical Linguistics and Automatic Translation, report NSF-20*, ed. Susumu Kuno. Cambridge MA: Harvard University.
- Lakoff, George, and Mark Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.
- Laso Martín, Natàlia Judith. 2009. A Corpus-based study of the phraseological behaviour of abstract nouns in medical English - A needs analysis of a Spanish medical community. Doctoral Dissertation, Universitat de Barcelona, Barcelona, Spain.
- Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.
- Levin, Beth, and Malka Rappaport. 1986. The formation of adjectival passives. *Linguistic Inquiry* 17:623–661.
- Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity at the Syntax-Lexical Semantics Interface*. Cambridge, MA: MIT Press.
- Levin, Beth, and Malka Rappaport Hovav. 2010. Lexicalized scales and verbs of scalar change. University of Chicago, Chicago: Talk on the 46th Annual Meeting of the Chicago Linguistic Society.
- Levin, Beth, and Malka Rappaport Hovav. 2013. Lexicalized meaning and manner/ result complementarity. In *Subatomic Semantics of Event Predicates*, ed. Boban Arsenijević, Berit Gehrke, and Rafa Marín, 49–70. Berlin: Springer.
- Levin, Beth, and Malka Rappaport Hovav. 2014. Manner and result: The view from *clean*. In *Language Description Informed by Theory*, ed. Myfany Turpin Rob Pensalfini and Diana Guillemin, 337–360. Amsterdam: John Benjamins.
- Luhn, Hans Peter. 1960. Keyword-in-context index for technical literature. *American Documentation* 11:288–295.
- Luo, Zhaohui. 2011a. Contextual analysis of word meanings in type-theoretical semantics. In *Logical Aspects of Computational Linguistics*, ed. Sylvain Pogodalla and Jean-Philippe Prost, volume 6736 of *Lecture Notes in Computer Science*, 159–174. Springer. URL http://dx.doi.org/10.1007/978-3-642-22221-4_11.
- Luo, Zhaohui. 2011b. Type-theoretical semantics with coercive subtyping. In *Proceedings of Semantics and Linguistic Theory (SALT) 20*, ed. Nan Li and David Lutz, 38–56. eLanguage.

- Maienborn, Claudia. 2001. On the position and interpretation of locative modifiers. *Natural Language Semantics* 9:191–240.
- Majid, Asifa, James B. Boster, and Melissa Bowerman. 2008. The cross-linguistic categorization of everyday events: A study of cutting and breaking. *Cognition* 109:235–250.
- Marantz, Alec. 1984. *On the Nature of Grammatical Relations*. Cambridge, MA: MIT Press.
- Martin-Löf, Per. 1984. *Intuitionistic Type Theory*, volume 17. Naples: Bibliopolis.
- McCarthy, Diana. 1997. Word sense disambiguation for acquisition of selectional preferences. In *Proceedings of the ACL/EACL 97 Workshop Automatic Information Extraction and Building of Lexical Semantic Resources for NLP Applications*, 52–61.
- McKoon, Gail, and Talke Macfarland. 2000. Externally and internally caused change of state. *Language* 76:833–58.
- Mendikoetxea, Amaya. 1999. Construcciones inacusativas y pasivas. In *Gramática Descriptiva de la Lengua Española*, ed. Ignacio Bosque and Violeta Demonte, 1575–1629. Madrid: Espasa Calpe.
- Merlo, Paola, and Suzanne Stevenson. 2001. Automatic verb classification based on statistical distributions of argument structure. *Computational Linguistics* 27:373–408.
- Moliner, Maria. 2008. *Diccionario de Uso del Español*. Madrid: Gredos.
- Montague, Richard. 1974. *Formal Philosophy; Selected Papers of Richard Montague*. New Haven: Yale University Press.
- Mourelatos, Alexander. 1978. Events, processes, and states. *Linguistics and Philosophy* 2:415–434.
- Myers, Margaret. 2000. Qualitative research and the generalizability question: Standing firm with Proteus. *The Qualitative Report* 4:1–9.
- Nunberg, Geoffrey. 1995. Transfer of meaning. *Journal of Semantics* 27:109–132.
- Parsons, Terence. 1990. *Events in the Semantics of English: A Study in Subatomic Semantics*. Cambridge, MA: MIT Press.

- Piñón, Christopher. 2001. A finer look at the causative-inchoative alternation. In *Proceedings of Semantics and Linguistic Theory 11*, ed. Neil Ashton et al., 346–364. Ithaca, NY: CLC Publications.
- Piñón, Christopher. 2008. Aspectual composition with degrees. In *Adjectives and Adverbs: Syntax, Semantics, and Discourse*, ed. Louise McNally and Christopher Kennedy, 183–219. Oxford: Oxford University Press.
- Piñón, Christopher. 1997. Achievements in an event semantics. In *Proceedings of SALT 7*, ed. Aaron Lawson and Eun Cho, 273–296. URL <http://pinon.sdf-eu.org/covers/aes.html>.
- Pustejovsky, James. 1995. *The Generative Lexicon*. Cambridge, MA: MIT Press.
- Pustejovsky, James, and Patrick Hanks. 2001. Very large lexical databases: An ACL tutorial. In *ACL (Companion Volume)*, 2. URL <http://dblp.uni-trier.de>.
- Pustejovsky, James, Patrick Hanks, and Anna Rumshisky. 2004. Automated induction of sense in context. In *Proceedings of the 20th International Conference on Computational Linguistics, COLING '04*, 924–930. Stroudsburg, PA, USA: Association for Computational Linguistics. URL <http://dx.doi.org/10.3115/1220355.1220488>.
- Ramchand, Gillian. 1997. *Aspect and Predication*. Oxford: Clarendon Press.
- Ranta, Aarne. 1994. *Type Theoretical Grammar*. Oxford: Oxford University Press.
- Rappaport Hovav, Malka. 2008. Lexicalized meaning and the internal temporal structure of events. In *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*, ed. Susan Rothstein, 13–41. Amsterdam: John Benjamins.
- Rappaport Hovav, Malka, and Beth Levin. 1998. Building verb meanings. In *The Projection of Arguments, Lexical and Compositional Factors*, ed. Miriam Butt and Wilhelm Geuder, 97–134. Stanford: CSLI Publications.
- Rappaport Hovav, Malka, and Beth Levin. 2005. Change of state verbs: Implications for theories of argument projection. In *The Syntax of Aspect*, ed. Nomi Erteschik-Shir and Tova Rapoport, 274–286. Oxford: Oxford University Press.
- Rappaport Hovav, Malka, and Beth Levin. 2010. Reflections on manner/ result complementarity. In *Lexical Semantics, Syntax, and Event Structure*, ed. Malka Rappaport Hovav, Edit Doron, and Ivy Sichel, 21–38. Oxford: Oxford University Press.

- Rappaport Hovav, Malka, and Beth Levin. 2012. Lexicon uniformity and the causative alternation. In *The Theta System: Argument Structure at the Interface*, ed. Martin Everaert, Marijana Marelj, and Tal Siloni, 150–176. Oxford: Oxford University Press.
- Real Academia Española, ed. 2001. *Diccionario de la Real Academia Española*. Madrid: Espasa, 22nd edition.
- Real Academia Española, ed. 2009. *Nueva Gramática de la Lengua Española*. Madrid: Espasa.
- Recanati, François. 2005. Literalism and contextualism: some varieties. In *Contextualism in Philosophy*, ed. G. Preyer and G. Peter, 171–196. Cambridge, MA: MIT Press.
- Reinhart, Tanya. 2000. The theta system: Syntactic realisation of verbal concepts. Ms. Utrecht University.
- Reinhart, Tanya. 2003. The theta system - an overview. *Theoretical Linguistics* 28.
- Reinhart, Tanya. 2006. Syntactic effects of lexical operations: Reflexives and unaccusatives. Ms. Utrecht University.
- Resnik, Gabriela. 2011. Los Nombres Eventivos no Deverbales en Español. Doctoral Dissertation, Universitat Pompeu Fabra, Barcelona, Spain. URL <http://www.tdx.cat/handle/10803/22647>.
- Resnik, Philip. 1993. A Class-Based Approach to Lexical Relationships. Doctoral Dissertation, University of Pennsylvania, Philadelphia, PA.
- Rodríguez Arrizabalaga, Beatriz. 2003. Sobre verbos de cambio ingleses y españoles: Las clases de ‘BREAKING’ y CUTTING frente a las de ‘ROMPER’ y ‘CORTAR’. In *Gramática de Construcciones, Contrastes entre el Inglés y el Español*, ed. Montserrat Martínez Vázquez, 91–140. Huelva: Universidad de Huelva.
- Rothstein, Susan. 2004. *Structuring Events: A Study in the Semantics of Lexical Aspect*. Oxford: Blackwell.
- Rusiecki, Jan. 1985. *Adjectives and Comparison in English: A Semantic Study*. Essex: Longman.

- Schmid, Helmut. 1994. Probabilistic part-of-speech tagging using decision trees. In *Proceedings of International Conference on New Methods in Language Processing*. Manchester, UK. URL <http://www.bibsonomy.org/bibtex/2ea24eb724e7415be7d9083f4a20fd764/fluctuator>.
- Schulte im Walde, Sabine. 2006. Experiments on the automatic induction of German semantic verb classes. *Computational Linguistics* 32:159–194.
- Searle, John. 1980. The background of meaning. In *Speech Act Theory and Pragmatics*, ed. John Searle, Ferenc Kiefer, and Manfred Bierwisch, 221–233. Dordrecht: D. Reidel Publishing.
- Sinclair, John. 1991. *Corpus, Concordance, Collocation*. Oxford: Oxford University Press.
- Smith, Carlota. 1970. Jespersen's 'move and change' class and causative verb in English. In *Linguistic and Literature Studies in Honor of Archibald A. Hill. vol. 2: Descriptive Linguistics*, ed. Mohammad Ali Jazayery, Edgar C. Polomé, and Werner Winter, 101–109. The Hague: Mouton.
- Spalek, Alexandra A. 2012. Putting order into literal and figurative uses of verbs: romper as a case study. *Borealis - An International Journal of Hispanic Linguistics* 140–167. URL <http://dx.doi.org/10.7557/1.1.2.2341>.
- Spalek, Alexandra A. 2013. La polisemia en algunos verbos de cambio de estado del español y del inglés. Observaciones preliminares. In *Los Verbos en los Diccionarios. Anexos de Revista de Lexicografía 20*, ed. Sergi Torner and Elisenda Bernal, 131–144. Universidade da Coruña.
- Spalek, Alexandra A. 2014. Calculating scales from change of state verbs and their themes. In *ConSOLE XXI Proceedings*, 229–246. Leiden: Universiteit Leiden.
- University, Princeton. 2010. About WordNet. URL <http://wordnet.princeton.edu>.
- Van Valin, Robert, and David Wilkins. 1996. The case for “effector”: Case roles, agents, and agency revisited. In *Grammatical constructions*, ed. Masayoshi Shibatani and Sandra Thompson, 289–322. Clarendon Press.
- Van Voorst, Jan. 1995. The semantic structure of causative constructions. *Studies in Language* 19:159–194.
- Vendler, Zeno. 1957. Verbs and times. *The Philosophical Review* 66:143–160.

- Verkuyl, Henk J. 1972. *On the Compositional Nature of the Aspects*, volume 15 of *Foundation of Language Supplementary Series*. Dordrecht, The Netherlands: D. Reidel Publishing.
- Verspoor, Cornelia Maria. 1996. Lexical limits on the influence of context. In *Eighteenth Annual Conference of the Cognitive Science Society*, 116–120. Leiden: Lawrence Erlbaum Associates Publishers.
- Viberg, Åke. 2007. Whole and broken. Breaking and cutting in Swedish from a crosslinguistic perspective. In *Communication - Action - Meaning. A Festschrift to Jens Allwood*, ed. E. Ahlsén et al, 17–42. Göteborg University: Department of Linguistics.