



UNIVERSIDAD DE LA RIOJA

TESIS DOCTORAL

Título
Bases for the development of ontological semantics within the conceptual domains of change and possession. Implementations and implications for the lexico-syntactic-cognition interface and the development of intelligent agents
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Titulación
Departamento
Filologías Modernas
Curso Académico



Bases for the development of ontological semantics within the conceptual domains of change and possession. Implementations and implications for the lexico-syntactic-cognition interface and the development of intelligent agents,
tesis doctoral

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Abstract

This dissertation sets out to examine the conceptual domains of CHANGE and POSSESSION by selecting two main verbal classes, namely entity-specific change-of-state verbs for the domain of CHANGE and *contribute* verbs for that of POSSESSION. The most important step consisted in finding a theoretical framework capable of accounting for the intricate syntactic behavior of these two classes and of giving equal importance to the contribution of both lower-level and high-level configurations. After reviewing eight of the most representative Construction Grammar (CxG) models (e.g. Fillmore's *Case Grammar*, Lakoff's CxG, Langacker's *Cognitive Grammar*, Goldberg's CxG, Croft's *Radical Construction Grammar*, Boas's frame semantic approach, *Embodied Construction Grammar* and *Fluid Construction Grammar*), we have inclined the balance in favor of the *Lexical Constructional Model* or LCM (Ruiz de Mendoza & Mairal 2008, 2011; Mairal & Ruiz de Mendoza 2008, 2009), which proposes a fruitful collaboration between the linguistic and the computational fields.

The present research also shows that the *internal* and *external constraints* formulated by the LCM constitute useful analytical tools for the integration of entity-specific change-of-state and *contribute* verbs into constructions, such as the intransitive resultative (e.g. *Competition can deteriorate into rivalry*), the caused-motion (e.g. *They burnt the house to the ground*), the way construction (e.g. [...] *Olympic bronze medalist Eliud Kipchoge of Kenya blistered his way to a new American All-Comers Record [...]*), and the dative construction (e.g. *We paid out pensions to ten million people and Child Benefit to every family in the land*). For example, the *Lexical Class* internal constraint explains why a verb like *stagnate* cannot fuse with the way construction (cf. **He stagnated his way to the top of the Party*), which involves literal (e.g. *The wounded soldiers limped their way across the field*) or figurative motion (e.g. *Sally drank her way through a case of vodka*). The resultant expression *to the top of the Party*, which suggests a change of position on a social scale, is incompatible with the verb *stagnate*, which indicates cessation of motion or progress. On the other hand, external constraints refer to cognitive operations such as metaphors and metonymies. Low-level metaphors can also interact, thereby giving rise to double-source metaphoric amalgams as in *High expectations [...] have gradually eroded to the general disappointment*, which combines two metaphors, i.e. A (NEGATIVE) CHANGE OF STATE (OF AN ABSTRACT ENTITY) IS EROSION and A CHANGE OF STATE IS A CHANGE OF LOCATION.

A second major goal of this dissertation concerns the validity of linguistic hypotheses which are tested against a multipurpose NLP system known as FunGramKB (Periñán & Arcas 2004, 2005, 2006; Periñán & Mairal 2009, 2010, to name a few). We also provide a computational implementation of semantic knowledge by showing how linguistic information is modeled in three distinct modules, viz. the Ontology, the Lexicon, and the Grammaticon and how they are interrelated via the CLS (Conceptual Logical Structure) Constructor.

ACKNOWLEDGEMENTS

This dissertation owes its conception to the invaluable guidance and encouragement of my advisors, Dr. Francisco Ruiz de Mendoza Ibáñez and Dr. Rocío Jiménez Briones. I am profoundly indebted to Dr. Francisco Ruiz de Mendoza Ibáñez for instilling in me the love of linguistics through his courses, insightful discussions and his insistence on precision and clarity. The making of this research was also possible due to financial support provided by the DGI, Spanish Ministry of Science and Innovation, grants no. HUM2007-65755, and no. FFI2010-17610/FILO, as well as the PhD scholarship which I have enjoyed since 2009.

Resumen

Esta tesis se propone examinar los dominios conceptuales del CAMBIO y la POSESIÓN, centrándose en dos clases verbales principales, a saber los verbos de cambio de estado específico para el dominio del CAMBIO y los verbos de contribución para el dominio de la POSESIÓN. El paso más importante consiste en encontrar un marco teórico capaz de dar cuenta del complejo comportamiento sintáctico de estas dos clases verbales y de lograr un equilibrio entre las configuraciones de bajo y alto nivel. Después de estudiar ocho de los modelos construccionistas más representativos (ej. la Gramática del Caso de Fillmore, la Gramática de Construcciones de Lakoff, la Gramática Cognitiva de Langacker, la Gramática de Construcciones de Goldberg, la Gramática de Construcciones Radical de Croft, el enfoque de los marcos semánticos de Boas, la Gramática de Construcciones Corpórea de Bergen y Chang y la Gramática de Construcciones Fluida de Steels), nos hemos decantado por el Modelo Léxico Construccional (MLC; Ruiz de Mendoza y Mairal 2008, 2011; Mairal y Ruiz de Mendoza 2008, 2009), que propone una colaboración provechosa entre los campos lingüísticos y computacionales.

El presente trabajo de investigación también demuestra que los restrictores internos y externos formulados por el MLC constituyen herramientas analíticas útiles para la subsunción de los verbos de cambio específico y los verbos de contribución en construcciones como la construcción intransitiva de resultado (ej. *Competition can deteriorate into rivalry*), la construcción de camino (ej. [...] *Olympic bronze medalist Eliud Kipchoge of Kenya blistered his way to a new American All-Comers Record [...]*), y la construcción dativa (ej. *We paid out pensions to ten million people and Child Benefit to every family in the land*). Por ejemplo, la Construcción de la Clase Léxica explica por qué el verbo *stagnate* ‘estancarse’ no puede fusionarse con la construcción de camino (ej. **He stagnated his way to the top of the Party*), que supone movimiento literal y figurado (ej. *The wounded soldiers limped their way across the field/ Sally drank her way through a case of vodka*). La expresión de resultado *to the top of the Party* ‘en la cima del partido’, que sugiere un cambio de posición en una escala social, es incompatible con el verbo *stagnate* ‘estancarse’, que indica cese de movimiento o progreso. Por otra parte, los restrictores externos hacen referencia a operaciones cognitivas como las metáforas y las metonimias. Las metáforas de bajo nivel pueden también interactuar creando amalgamas metafóricas como en el ejemplo *High expectations [...] have gradually eroded to the general disappointment*. Esta oración combina dos metáforas: UN CAMBIO DE ESTADO NEGATIVO (DE UNA ENTIDAD ABSTRACTA) ES UNA EROSIÓN y UN CAMBIO DE ESTADO ES UN CAMBIO DE LUGAR.

El segundo objetivo de esta tesis doctoral se centra en verificar la adecuación de las hipótesis lingüísticas para el procesamiento de lenguaje natural mediante su

implementación en el sistema denominado FunGramKB (Periñán y Arcas 2004, 2005, 2006; Periñán y Mairal 2009, 2010). Así, este trabajo proporciona una implementación computacional del conocimiento semántico, demostrando cómo la información lingüística se modela en tres módulos distintos, concretamente la Ontología, el Lexicón, y el Gramaticón y como se relacionan entre sí.

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List of Abbreviations

AdvP	Adverbial Phrase
AHD	American Heritage Dictionary
AHTY	A hole through Y construction
AI	Artificial Intelligence
AP	Adjectival Phrase
AVM	Attribute-value-matrices
BCxG	Berkeley Construction Grammar
BNC	British National Corpus
CaG	Case Grammar
CD	Cambridge Dictionary
CED	Collins English Dictionary
CxG	Construction Grammar
CG	Cognitive Grammar
CL	Clave
CLS	Conceptual Logical Structure
COCA	Corpus of Contemporary American English
COREL	Conceptual Representation Language
CT	Constructional Template
DOR	Direct Object Restriction
DRAE	Diccionario de la Real Academia Española
EAGLES	The Expert Advisory Group on Language Engineering Standards
ECG	Embodied Construction Grammar
FCG	Fluid Construction Grammar
FE	Frame Element
FG	Functional Grammar
FLM	Functional Lexematic Model
FunGramKB	Functional Grammar Knowledge Base
HPSG	Head-Driven Phrase Structure Grammar
ICM	Idealized Cognitive Model
ISLE	International Standards for Language Engineering
LD	Longman Dictionary
LM	Landmark

LS	Logical Structure
L-Subject	Location Subject construction
LT	Lexical Template
LU	Lexical Unit
MP	Meaning Postulate
NLP	Natural Language Processing
NP	Noun Phrase
OLIF	Open Lexicon Interchange Format
PP	Prepositional Phrase
RCG	Radical Construction Grammar
RRG	Role and Reference Grammar
SFG	Systemic Functional Grammar
TF	Thematic Frame
TR	Trajector
VP	Verb Phrase
WR	Word Reference Dictionary

Chapter 1

Introduction

This dissertation aims to promote the convergence of two unrelated fields, namely the linguistic realm and the computational one. This has been possible by the integration of the postulates held by the Lexical Constructional Model (LCM; Mairal & Ruiz de Mendoza 2008, 2009; Ruiz de Mendoza & Mairal 2008) into the Artificial Intelligence project labeled FunGramKB (Periñán & Arcas 2004, 2005, 2008ab). Our research work deals with the conceptualization and expression of the domains of change of state and change of possession in English under the light of *Cognitive Semantics* and *Construction Grammar*. The analyses provided in the first part of this study will mainly follow the proposals of the Lakoffian version of Cognitive Semantics, the constructional approach to grammar developed by Goldberg (1995, 2006), and the lexico-syntactic accounts formulated by authors such as Boas (2008ab) and Iwata (2005), to name just a few. This research shows how these two last constructional accounts can be fruitfully combined into a single theoretical model, viz. the LCM.

Since we will center our attention on core grammar characterizations (i.e. argument structure constructions) or, in terms of the LCM, level 1 constructions, it is of vital importance to understand how this notion is conceived diachronically within the most representative constructionist models, ranging from Fillmore's (1968) Case Grammar and Goldberg's CxG to Bergen & Chang's (2005) Embodied Construction Grammar. The definition of construction has received different interpretations depending on the approach adopted. Initially, constructions were regarded as non-predictable, idiosyncratic conventional associations of syntactic and semantic information (cf. Fillmore's CaG). The later developments of this concept are more

encompassing in the sense that fully transparent and compositional expressions can also be grouped under the rubric of constructions as long as they are entrenched in the language (cf. Goldberg 2006; Langacker 2003ab; the LCM). We were concerned not only with the understanding of the notion of construction but also with the ways in which constructions combine. Goldberg's (1995) work revolves around the fusion between participant and argument roles but the *Semantic Coherence* and the *Correspondence Principle* are too generic to provide a fully-fledged account of the principles that license or block out lexical-constructional subsumption. The LCM does account for such principles, although the existing list is far from complete and the number of lexical classes and constructions that have been addressed is very limited so far. The present dissertation attempts to contribute to such development by means of an exhaustive examination of the constructional behavior of entity-specific change-of-state verbs and *contribute* verbs.

An improvement of this research, if compared to Goldberg's work, is the onomasiological arrangement of verbal classes based on the classification put forward by Levin (1993) and Faber & Mairal's (1999) lexematics-oriented taxonomies. We have refined Faber & Mairal's lexical class organization by using a larger amount of data and also computerized corpora, which were not extensively available to these authors when they wrote their works. Common features have been factorized by a direct observation of the semantic and syntactic behavior of predicates. We have elaborated a hierarchy of hyponyms and hyperonymic concepts which differ with respect to their degree of genericity/specificity. Hyponyms inherit the nuclear meaning from their superordinate predicates but they are also characterized by a set of distinguishing features which separate them from other lexical items found at the same level. Our findings are in consonance with the claims made by Levin (1993) and Faber & Mairal (1999) that

predicates belonging to the same class/subclass display similar syntactic behavior, i.e. they can generally be subsumed into the same set of constructions. For instance, the verbs *bloom*, *blossom*, *flower*, *sprout*, and *germinate* share both the conceptual structure and the syntactic behavior of their genus *develop*, i.e. they encode an increase in size conveyed by means of an intransitive resultative construction.

It is also worth pointing out that we have first investigated the proposals made by FrameNet with regard to these two verbal classes. We have identified several drawbacks of this database: (i) only a small number of entity-specific change-of-state verbs were listed in FrameNet (eight out of twenty one verbs); (ii) there is a separation of the causative and inchoative uses of a verb into two different frames; (iii) in some cases no examples are provided for the Frame Elements of a particular verb (e.g. there are no examples for the verb *swell* in the ‘expansion’ and ‘change_position_on_a_scale’ frames); (iv) usually FrameNet includes literal instantiations of the predicates under consideration and when figurative uses are listed no motivation is given for those metaphorical expressions; (v) often frames are incomplete owing to the use of a small size corpus (i.e. the British National Corpus), which offers a limited number of examples for a given verb.

A specific aim of this study is to shed light on the form and meaning of entity-specific change-of-state verbs and *contribute* verbs and to examine the conceptual structure of the main constructions in which these verbs appear, viz. the intransitive locative/temporal/frequency, intransitive causal, intransitive resultative, causative, resultative, caused-motion and *way* constructions, and also the ditransitive and the dative constructions, which often alternate with the former. The theoretical framework of the LCM is halfway between Goldberg’s (1995, 2006) top-down account and the

bottom-up constructionist approaches propounded by authors like Boas (2003, 2008ab), Iwata (2008), or Nemoto (2005). The departing assumption is that high-level constructions interact in various ways with low-level configurations. The first situation involves a perfect correspondence between the constructional and verbal semantics, as made evident by the case of the verb *break*, which is subsumed into the transitive construction (cf. *He broke the window*) because it shares with this construction the relevant elements of structure, i.e. an effectual action that causes a change of state. In the LCM this situation is labeled *Full Matching*, since it refers to the full identification of variables, subevents, and operators between the lexical and the constructional templates. The discussion of *Full Matching* as well as other instantiations of internal constraints will be reintroduced later in connection to entity-specific change-of-state verbs.

A second possibility arises from constrained coercion whereby the meaning of a predicate has to adjust to the overall meaning of a construction so that it can fuse with it. A case in point is supplied by the verb *deceive*, which undergoes a process of adaptation in order to fit the caused-motion construction (cf. [...] *I deceived her into thinking that she had scared me [...]*; COCA 1989). In this example the verb *deceive* changes its *Aktionsart* structure (from an activity to a causative accomplishment) by means of a high-level metaphor A MENTAL MANIPULATIVE ACT IS AN EFFECTUAL ACTION. A third case, which is not contemplated by Goldberg's CxG, is that in which the internal semantic make-up of a predicate restricts the nature of its constructional arguments. The entity undergoing a change together with the information encoded by the verb *balloon* constrain the choice of the prepositional slot in the intransitive resultative construction, which must have greater meaning implications than the changing entity (e.g. [...] *an army mutiny rapidly ballooned into a major political*

rebellion *by a group of soldiers [...]*). A fourth case is that in which the semantic configuration of a predicate overrides the meaning implications of a construction, as in *The National Union of Mineworkers and the oil sheikhs denied him the title* (BNC B0H 952). The verb *deny* cancels out the successful transfer interpretation contributed under normal circumstances by the ditransitive construction.

With all this in mind, we will try to prove that the *external* and *internal* constraints postulated by the LCM play a key role in licensing and blocking out the lexical-constructional fusion between entity-specific change-of-state and *contribute* verbs and the aforementioned constructions. The external constraints involve cognitive mechanisms such as high-level metaphor and metonymy, which produce a change in perspective of a lexical predicate and allow it to be easily subsumed into a given construction. On the other hand, the internal constraints concern the internal structure of a predicate (i.e. its encyclopedic and event structure makeup) and how this can be altered in order to fit into a certain construction. For example, resultative constructions which take the form of a caused-motion construction can be based on a high-level metaphoric chain with various low-level mappings. The sentence *They have metamorphosed into a cancer rotting the life out of our democracies* is motivated by a metaphoric complex composed of two high-level metaphors: (1) AN EFFECTUAL ACTION IS CAUSED MOTION, and (2) GETTING RID OF A PROPERTY IS GETTING RID OF A MOVING OBJECT. Furthermore, entity-specific change-of-state verbs can participate in an intransitive causal construction which conflates causality with spatiality by means of a low-level metaphor STATES ARE LOCATIONS (e.g. *But bells now rust* from inactivity, where a state of inactivity is the starting point on a physical degradation path). In a similar vein to Lakoff's (1987: 74) discussion of the term *mother*, we can understand the verb *contribute* as a radial concept with a basic

concrete meaning and several metaphorical extensions. For instance, the middle use of *contribute* in *His ideas contributed to the development of the project* is licensed by the metaphor ABSTRACT ENTITIES ARE OBJECTS and the metonymy PROCESS FOR ACTION.

The LCM has formulated six main internal constraints operating on subsumption processes, namely *Full Matching*, *Event Identification Condition*, *Lexical Blocking*, *Lexical Class Constraint*, *Predicate-Argument Conditioning* and *Internal Variable Conditioning*. The verb *burn* in the intransitive construction *The fire burns* obeys the internal constraint called *Full Matching*, since the internally-caused change-of-state verb fuses perfectly with a construction indicating an action carried out and undergone by the subject. In the sentence *He burnt them to death* the PP describes the final resulting event whilst the verb encodes a prior causal subevent. The verb in a resultative construction must be the closest temporal subevent to the resultant state. That is why the resulting event cannot be rendered by a sentence such as **He kindled them to death* because this verb refers to the first sequence in the chain of events (i.e. causing an entity to start burning). Thus, the *Event Identification Condition* blocks out the integration of the verb *kindle* into the resultative construction, since there is a mismatch between the subevents encoded by the verb and those of the construction.

The third constraint, i.e. *Lexical Blocking*, prevents the unification of the AP *burnt* with a resultative construction in which the verb *burn* is employed (cf. **The man burnt the house burnt*). Moreover, the *Lexical Class Constraint* disallows the ditransitive construction **George ponied up Bob \$3000* since *pony up* belongs to a verbal class which highlights the reluctance of the agent to transfer an entity (e.g. *shell out*, *fork out*, *cough up*). The unwillingness of transfer on the part of the agent clashes with one of the

fundamental requirements of the ditransitive construction, namely the agent's intention to perform the giving event. The Y element in the resultative construction *The animal molted out its skin/hair/shell* is constrained by the choice of the verb *molt* and the PP *out*. The *Predicate Argument Conditioning* constraint stipulates that the Y element can only be a bodily covering but never a body part (cf. **The animal molted out its head/tail/paws*). The *Internal Variable Conditioning* constraint is at work when the information encapsulated by a predicate determines the choice of the Z element in an intransitive resultative construction. The semantic makeup of the verb *swell* and the entity undergoing swelling constrain the nature of the resultant entity Z, which must be bigger in size or have a bigger value than the Y element (e.g. *The work, which was originally meant to consist only of a few sheets, swelled into ten volumes*). Finally, the LCM has recently added a new internal constraint to this list, *Focal Prominence Compatibility* constraint, which explains why the verb *contribute* cannot appear in the ditransitive construction. The inherent focal prominence requirements of this verb (i.e. the existence of multiple contributors with multiple contributions) clash with those of the ditransitive construction (i.e. a single giving act).

Another major aim of this dissertation consists of demonstrating the usefulness of combining linguistic knowledge with the field of Artificial Intelligence. In order to test the validity of its linguistic findings, the LCM has decided to collaborate with a multifunctional and multilingual NLP system labeled FunGramKB. The selection of this particular knowledge base is motivated by several factors. First, the formalism of FunGramKB relies on solid linguistic models, such as Dik's Functional Grammar (1997) or Van Valin & La Polla's (1997) Role and Reference Grammar. However, this NLP system surpasses them in that (i) it proposes a conceptual orientation by dealing with universal concepts and not language-dependent words; (ii) it replaces RRG logical

structures with Conceptual Logical Structures or CLSs, which do not express redundant information and incorporate not only the syntactically relevant aspects of meaning; (iii) CLSs are enriched with cultural and encyclopedic knowledge via inheritance mechanisms. Second, the description of meaning in FunGramKB goes beyond the relational approach adopted by lexicographical databases such as SIMPLE or EuroWordNet, since it embraces a conceptual perspective which is more parsimonious (e.g. the minimization of redundancy through the agglutination of various lexical units to a single concept, the clustering of words encoding the same cognitive scenario, etc.) and it allows for a greater expressive power (e.g. it codes quantification, temporality, modality; it is non-monotonic, thus, permitting the withdrawal of predications).

In chapter 2 we provide an exhaustive description of the architecture of FunGramKB, which makes a neat distinction between the linguistic and the conceptual levels:

- (i) The linguistic level comprises a lexical and a grammatical module. The lexical component can be further divided into: (a) a Morphicon, and (b) a Lexicon. What concerns us here is the information gathered in the Lexicon (e.g. the number of variables, the *Aktionsart*, the assignment of macroroles, the collocations) and its relevance at the syntactic level. The grammatical level, also known as the Grammaticon, has four Constructicon modules: (a) L1-Constructicon or the argument structure layer; (b) L2-Constructicon or the implicational layer; (c) L3-Constructicon or the illocutionary level; and (d) L4-Constructicon or the discourse-structure level.
- (ii) The conceptual level is an accurate representation of Tulving's (1985) long-term memory model in the sense that it is composed of three language-

independent knowledge schemata. The Cognicon stores procedural knowledge, the Onomasticon deals with episodic knowledge, whereas the Ontology is organized as a hierarchical catalogue of universal concepts.

Chapter 5 offers an application of how semantic knowledge can be treated computationally by establishing a connection between three FunGramKB modules, i.e. the Ontology, the Lexicon, and the Grammaticon. The Ontology is made of three types of conceptual units: *metaconcepts*, marked by the symbol #, *basic concepts*, preceded by +, and *terminal concepts*, headed by the symbol \$. In line with the hierarchical organization of the Ontology, we will show that the basic concept +BURN_00 depends conceptually on the following superordinate concepts and metaconcepts: +BURN_00 << +DAMAGE_00 << +CHANGE_00 << #TRANSFORMATION << #MATERIAL << #EVENT. To preserve the minimization of redundancy commitment, we have agglutinated verbs like *combust*, *conflagrate*, *ignite*, *inflamm*, *kindle* [Eng] and *arder*, *encender* [Spa] as lexical units linked to the basic concept +BURN_00. Let us point out that basic and terminal concepts are characterized by conceptual properties realized in the form of *thematic frames* and *meaning postulates*. Also, new terminal concepts have been created whenever some concept exhibited a distinctive feature (or *differentia*) which was not present in the meaning postulate of its superordinate concept. For instance, we have inserted the terminal concept \$CAUTERIZE_00 which displays the following meaning postulate: +(e1: +BURN_00 (x1)Theme (x2)Referent (f1: +HEAT_00 ^ +CHEMICAL_00)Instrument) (f2: (e2: +CURE_00 (x1)Theme (x2)Referent)Purpose). The last section in chapter 5 illustrates how the CLS Constructor gathers the core-grammar information stored in the Lexicon (e.g. the number of variables of a predicate, its *Aktionsart*, its collocational and constructional patterns) and the conceptual information from the Ontology (e.g. the thematic frame and meaning

postulate of a predicate) and produces a basic CLS. On a second stage the same CLS Constructor adds the information in the Constructicon to this basic CLS and creates a derived CLS.

This dissertation is divided into two different parts. The first part focuses on: (i) the main theoretical assumptions developed within the context of Construction Grammar, which will provide the theoretical foundations for our study, and (ii) the relevant methodological considerations. The second part is based exclusively on the analysis and explanation of corpora examples and a brief computational implementation of some of the basic assumptions of the LCM. In the following lines we examine in detail the contents of each section.

Chapter 1 (*Introduction*) attempts to stress the need for this piece of research and the reasons why it has been carried out. Thus, the motivation behind this dissertation is based on: (i) the necessity of a robust analysis of the constructional behavior of entity-specific change-of-state and *contribute* verbs, as well as of the principles regulating their subsumption processes, and (ii) the importance of establishing a connection between the linguistic and the computational fields in order to test existing hypotheses.

In Chapter 2 (*An overview of Construction Grammars*) we introduce the reader to the main postulates held within the paradigm of Cognitive Linguistics and more specifically, Construction Grammar. Seven of the most representative Construction Grammar exponents are critically reviewed and contrasted with the theoretical framework adopted for this dissertation. This chapter also contains information about the origins and the general architecture of the LCM. The notions of *lexical* and *constructional templates*, on the one hand, and of lexical-constructional *subsumption*, on the other, are central to our analysis of both entity-specific change-of-state and

contribute verbs. Furthermore, the last part of this chapter is devoted to the exploration of the Artificial Intelligence project known as FunGramKB.

Chapter 3 (*Research Methodology*) describes the procedures that have been followed throughout the research. The first part centers on the description of the corpus and the steps that have been taken to compile the data. The second part revises the methodological considerations and it also tries to account for all the decisions related to the methodology.

Chapter 4 (*Entity-specific change-of-state verbs and contribute verbs*) is based upon the analysis of two verbal classes, i.e. entity-specific change-of-state and *contribute* verbs. It discusses how these predicates are subsumed into a wide array of constructions, ranging from the intransitive locative/temporal/frequency, the intransitive resultative, and the resultative constructions to the ditransitive and dative constructions. The different subsections of this chapter highlight and make use of the external and internal constraints proposed in the LCM, as well as other explanatory tools.

Chapter 5 (*Linguistic knowledge and FunGramKB*) bridges the gap between the analysis carried out in the previous chapter and the Artificial Intelligence implementation of the Lexical Constructional Model. It does so by focusing on the change-of-state verb *burn* and its conceptual correlates within the Ontology. For this purpose, this chapter first offers an outline of the ontological modeling of concepts, together with a detailed account of the lexicographical work carried out in order to fill in the information in the Lexicon. The chapter then shows how three different FunGramKB modules, viz. the Lexicon, the Ontology and the Grammaticon, are connected via the CLS Constructor.

Chapter 6 (*Conclusions*) comprises all the findings of our investigation. There is an account of the goals that have been accomplished and it also includes several proposals for further research.

The final part of this dissertation includes the appendices and the reference section: *Appendix I* presents an exhaustive list of the FunGramKB metaconcepts, their definitions and their corresponding thematic roles; *Appendix II* reveals the semantic interpretation of satellites; *Appendix III* contains an account of the predication and participant operators, whereas *Appendix IV* displays a complete inventory of CLSs. The section entitled *References* offers a list of the bibliographical material that has been used for the present study.

Chapter 2

An overview of Construction Grammars

2. 1. Constructionist approaches to language

The perspective adopted in this dissertation inscribes itself in the field of Construction Grammar(s) (CxG), which has been denominated by Östman & Fried (2004: 1) ‘family of Construction Grammars’ owing to its expanding inventory of connected models. In this chapter eight of the most representative Construction Grammar exponents will be critically reviewed and compared to the *Lexical Constructional Model* or LCM (cf. Mairal & Ruiz de Mendoza 2008, 2009; Ruiz de Mendoza & Mairal 2008, 2011), which is the theoretical model on which we base the present research. Mirroring the temporal sequence in the development of constructionist approaches, this part will focus on the following most prominent models: (i) Fillmore’s *Case Grammar* (CaG; e.g. Fillmore 1968; Fillmore, Kay & O’Connor 1988[2003]; Fillmore & Kay 1995); (ii) Lakoff’s (1987) original version of CxG; (iii) Langacker’s *Cognitive Grammar* (CG) (1987, 1991ab, 2003ab); (iv) The CxG variant propounded by Goldberg (1995, 1996, 1997, 2002, 2003, 2005ab, 2006, 2009); (v) Croft’s *Radical Construction Grammar* (RCG) (cf. Croft 2001, 2003, 2005); (vi) the lexico-syntactic (usage-based) approach taken by Boas also called ‘frame-semantic’ approach from 2008 onwards (e.g. Boas 2000, 2002, 2003, 2005ab, 2009, 2010, 2011ab), and (vii) *Embodied Construction Grammar*, which is rooted in Lakoff’s (1987) CxG (ECG; cf. Bergen & Chang 2005) and *Fluid Construction Grammar* (FCG; cf. De Beule & Steels 2005).

Before moving on to characterize and contrast the existing Construction Grammars, we shall start by providing a clear description of the Construction Grammar

framework. According to Kay (1995: 171) Construction Grammar is “a non-modular, generative, non-derivational, monostratal, unification-based grammatical approach, which aims at full coverage of the facts of any language under study without loss of linguistic generalizations within and across languages”.

The *non-modularity* of this theory of grammar refers to the fact that the various linguistic levels, such as syntax, semantics and pragmatics form a continuum rather than separate, autonomous modules. In connection to this, Fried & Östman (2004) argue that Construction Grammar has been trying to enlarge what was considered until very recently a narrow view of pragmatics by integrating work on *discourse regularities* (Fried & Östman 2003) and the relation between constructions and *interaction* (Auer 2000; Lindström 2000; Thompson & Fox 2002; Wide 2002).

Saying that Construction Grammar is *generative* means that it aims to find the motivation behind all the grammatical sentences of a language, by capturing generalizations in the most economical way (cf. Fried & Östman 2004: 24) and by specifying why some linguistic expressions are blocked out (cf. Goldberg 1995: 7). In the light of this feature, Goldberg herself (2003: 219) points out that there is some resemblance between Construction Grammar and the mainstream generative approach: (i) both regard language as a cognitive (mental) system; (ii) both agree on the fact that there must be a way to combine utterances in order to create novel expressions, and (iii) both admit that a non-trivial theory of language acquisition must be postulated.

CxG is *non-derivational* and *monostratal* in the sense that there are no stages of derivation from the ‘initial stratum’ (or ‘deep structure’) to the next level (‘surface structure’), no transformations or movement. Constructs are not ‘generated’ but licensed by given abstract configurations on the basis of their compatibility (Leino 2005: 94).

Furthermore, CxG is *unification-based*¹ in that linguistic items that do not fit together ('unify') with respect to particular features (syntactic, semantic, pragmatic) will not be licensed as possible constructs of a language. To conclude, the full coverage aim is made evident in the egalitarian approach to language adopted by this linguistic model. Unlike generative grammar, which establishes a clear-cut distinction between 'core' and 'peripheral' structures, CxG does not assign a central status to any linguistic unit. A transitive clause like *John broke the window* is just as important as more idiomatic configurations like the correlative comparison construction *The more, the merrier*.

In spite of theoretical/methodological discrepancies, constructional approaches are argued to converge on several key insights (cf. Fried & Östman 2004: 11-25; Goldberg 2003; González García 2003: 143; also González García & Butler 2006):

- (i) In diametric opposition to the Chomskyan conception of constructions² as taxonomic artifacts, CxG considers that constructions are the basic units of description and explanation that are independent of the lexical items that fill them in. Thus, the 'What's X doing Y?' construction (Kay & Fillmore 1999) has the meaning of a complaint which cannot be derived from the sum of each of its lexical components. Constructions are regarded as pairings of form and meaning, where the form comprises information about morphosyntactic properties, prosodic

¹ This term is borrowed from Head-Driven Phrase Structure Grammar (HPSG), which is a generative grammar but differs from the Chomskyan approaches in that it does not make use of transformations or movement. Kim (2000: 7) defines HPSG as "a non-derivational, constraint-based, surface oriented grammatical architecture". In this model unification is a combinatorial procedure whereby the information encoded by two AVM (attribute-value-matrices) descriptions (i.e. feature structures) matches. When the information in the two AVMs is incompatible, the unification is infelicitous (cf. Riehemann 1995: 5; for example, since [NUM *sing*] and [NUM *plur*] are incompatible their unification fails).

² In this dissertation we are only concerned with the notion of construction within the cognitivist Construction Grammar framework. For a more ample discussion of the term construction, the reader is referred to Schönfeld's (2006) work, which presents an overview of this concept in traditional descriptive grammar, American structuralism, generative grammar and corpus linguistics.

or phonetic shape, whereas the function is related to semantic, discursive and pragmatic features (cf. Fried & Östman 2004: 19-23; Östman & Fried 2005: 1).

(ii) Constructions are conceived as psychologically real, free-standing theoretical entities. Provided that they are not in conflict, they can combine freely in order to form linguistic expressions. For example, the ungrammaticality of a sentence like **The man sent Madrid a box* can be accounted for by a conflict between the ditransitive construction, which requires an animate recipient, and the proper noun *Madrid*, which denotes an inanimate location that cannot actively participate in the transfer. Also, a simple sentence generally combines at least half a dozen different constructions. For the sake of illustration consider the example *The squirrel cracked his nut*, which was extracted from Goldberg & Suttle (2010). This utterance comprises a Verb Phrase (VP), a Noun Phrase (NP), a transitive and a subject-predicate construction as well as the individual constructions corresponding to each of the words used in the sentence.

(iii) As advanced from Kay's definition, CxG embraces a non-derivational and non-modular perspective, which entails a continuum between grammar and lexicon. No division is made between core and periphery since all constructions are equally important to the study of language. Just as Fried & Östman (2004: 16) have remarked "the unique contribution of Construction Grammar has been in providing analytic tools that do not require any *a priori* decisions about what should count as 'basic', or as the 'core' in language". Also, "by not assigning special status to certain fragments of grammar and by aspiring to give adequate, systematic, and formal descriptions of the morphology, syntax, semantics, and pragmatics of linguistic structures that are typically considered 'irregular' or

‘exceptional’, Construction Grammar has the potential for a uniform representation of *all* grammatical knowledge” (cf. Fried & Östman 2004: 18).

(iv) CxG adopts the *Principle of No Synonymy of Grammatical Forms* (Bolinger 1968: 27), which postulates that a difference in form is in fact a difference in meaning and function. Unlike generative grammar, which conceives the ditransitive construction as a derivation from the dative, in CxG the relation between the two constructions is seen in terms of paraphrase and partial lexical overlap.

(v) Grammar is viewed as a vast network of interrelated lexical and syntactic constructions with various degrees of specificity and syntactic complexity; generalizations across constructions are a matter of inheritance relations.³ Low-level configurations inherit properties from more abstract, higher-level ones. In relation to this, Goldberg (2003: 223) shows that the *What’s X doing Y?* construction inherits properties from other higher-level constructions like the Left Isolation, the Subject-Auxiliary Inversion, the Subject-Predicate and the Verb Phrase constructions.

(vi) The principle of compositionality⁴ is a pivotal notion in CxG. According to this principle the meaning of an expression is fully determined by the meanings that its components might have in isolation. Practitioners of CxG hold different views about the (non) compositionality of constructions. As already noted by

³ In this connection, hyponyms of Levin’s (1993) *contribute* verbs, which are treated as lexical constructions, can inherit semantic and syntactic properties from dominating constructions, such as their genus or superordinate term.

⁴ Langacker (1987: 487) argues that the composite structure “derives from its component structures solely by virtue of regular compositional principles”. Nevertheless, Turner & Fauconnier (1995) provide strong evidence against the principle of compositionality. Thus, the interpretation of the adjective *safe* in the phrases *dolphin-safe tuna* and *shark-safe beach* shows that semantic meaning is not compositional. The first expression involves the creation of safety condition for dolphins in the context of tuna harvesting, whereas the second expression refers to the conditions in which people may use a beach, i.e. when the beach is safe from sharks.

Dirven & Ruiz de Mendoza (2010: 23), the utterance *I painted myself in a corner* can receive two different interpretations: a compositional one which accounts for the literal meaning, i.e. the speaker made a drawing of himself/herself in a corner, and a non-compositional or idiomatic reading which encodes the notion of caused change, viz. the speaker expressed an opinion which committed him/her to things he/she subsequently regretted.

(vii) Another point Construction Grammars have in common is that they are usage-based accounts of language.⁵ The term “usage-based” was first introduced by Langacker (1987: 494) to identify an important property of his Cognitive Grammar and to assert that grammatical constructions are born out of usage by the entrenchment of the most frequently used patterns.

(viii) In accordance with Fried & Östman (2004: 23), CxG should be considered a cognitive model of language “in that it is inherently concerned with the cognitive correlates of any theoretical concepts and linguistic categories the model relies on”.

2. 2. Fillmore’s Case Grammar

The origin of Construction Grammar can be found in Case Grammar (Fillmore 1968, 1977ab; Dirven & Radden 1987) and the early versions of Frame Semantics (Fillmore 1982, 1985). Fillmore and the LCM differ greatly in their understanding of the notion of construction. According to Kay (2002: 1), Fillmore and his collaborators define constructions as “conventional associations(s) of any or all of the following kinds of grammatical information: syntactic, semantic – including pragmatic, lexical and

⁵ This feature is not shared by all constructionist approaches. González-García & Butler (2006: 44) claim that Fillmore’s Case Grammar is not a ‘usage-based’ approach because “it does not address any generalizations concerning the actual use of language (e.g. frequency) and/or fully compositional configurations (see Goldberg 2006, pp. 214-215)”.

phonological". Nevertheless, this CxG strand claims that constructions must be non-predictable and idiosyncratic, a position which is closer to the one initially adopted by Goldberg (1995) than to later developments of this CxG approach as is the case of Goldberg (2006, 2008). In sharp contrast to Fillmore and Kay's position, the LCM, just like Goldberg (2006), is more encompassing since it admits that even fully transparent or compositional expressions (e.g. *I love you*) are to be considered constructions as long as they are deeply entrenched in the linguistic system. Fillmore's CxG, also labeled *Berkeley Construction Grammar* (BCxG) and *Sign-Based CxG* from 2010 onwards, dispenses with the distinction between syntax and lexicon which form a continuum (Fillmore *et al.* 2003[1998]: 243). Despite this claim, BCxG is skeptical about the meaningfulness of all constructions (e.g. the Subject-Auxiliary Inversion construction). Additionally, Fillmore & Kay (1995) share a competence-based view of language and discriminate between constructions and *patterns of coinage*, which are not productive, as exemplified by Goldberg's (1995: 4) caused-motion construction in *She sneezed the napkin off the table*. This radical view is rooted in Fillmore *et al.*'s (1988[2003]) interest in the analysis of formal idioms, which are syntactic patterns characterized by grammatical irregularity in terms of meaning and syntactic composition. Some examples are the *What's X doing Y?* construction (e.g. *What's that fly doing in my soup?*), the correlative conditional *The X-er, The Y-er* (e.g. *The faster he runs, the slower she runs*), or the *Let Alone* pattern (e.g. *Tom won't eat prawns, let alone squid*). In order to determine the meaning of *What's your brother doing in my car?* we must reject a compositional approach since we are not questioning what someone is doing but why a given situation is happening. Nonetheless, the LCM contends that the meaning of the whole can be connected to the meaning of its parts and sometimes the meaning of the construction prevails over the interpretation that individual lexical items can assign

to a sentence. It is also worth noting that in the LCM the caused-motion construction (e.g. *She sneezed the napkin off the table*) is not a pattern of coinage but a construction in its own right. What is more, the LCM postulates the existence of constructions at four descriptive levels: the first level, or core module, deals with (non-idiomatic) argument structure constructions whereas levels 2, 3, and 4 contain idiomatic configurations, i.e. implicational, illocutionary and discourse constructions.

In concert with BCxG, the LCM acknowledges the continuum between syntax and lexicon, even though with a soft dividing line (see Butler 2009: 133-137 for an extensive discussion of this topic). BCxG and the LCM also diverge with respect to the position occupied by frequency: while the former does not make generalizations about the frequency of specific constructions (Goldberg 2006: 215), the latter considers that frequency has a role, together with the Langackerian notion of entrenchment, in constructional behavior. The LCM further adds that entrenchment is not only a matter of type frequency but also of acceptance of a given constructional option by the linguistic community, very much in line with Halliday's functionalism (cf. Halliday & Matthiessen 2004).

Also, in BCxG constructions have cognitive status but this approach does not give priority to psychological experimental work (cf. also Goldberg 2006: 220). Butler's (2009: 33) definition of psychological/cognitive adequacy runs as follows: "A functionalist theory should take into account what we know of the cognitive structures and mechanisms involved in the storage and processing of language". Regarding the psychological/cognitive adequacy of the LCM, it must be stated that the principles, processes and structures proposed by this model are derived from Cognitive Linguistics and the LCM makes use of cognitive notions in its explanations (e.g. in section 4.1.1 the

concept of conflation, which has empirical validity, will be extensively used to motivate the imposition of company, causality and instrumentality onto the preposition *with*).

Fillmore (1968) shows that semantic roles can be mapped onto different syntactic functions in a sentence. In the example *A long speech closed the meeting* the syntactic subject fulfills the semantic function of an instrument. In line with Dik's Functional Grammar (1997: 37), the LCM postulates the mapping of three different types of functions onto any lexical item, i.e. the ones already mentioned by Fillmore and the pragmatic functions of topic and focus.

One innovative aspect of BCxG is that it recognizes the existence of verb-specific situational roles or 'frame elements'. Taylor (1995: 87) defines a frame as "the knowledge network linking the multiple domains associated with a given linguistic form". For Taylor (1995), frames are static configurations of culture-based, shared and conventionalized knowledge. Words like *buy, sell, pay, money, spend*, etc., activate the COMMERCIAL EVENT frame. A frame comprises a 'core', which is made up of *sine-qua-non* elements or *participant roles* (buyer, seller, merchandise, market and money), and peripheral elements such as the manner of performing the transaction, its purpose, time and setting (e.g. department store, shopping center, etc.). In section 4.2.1 the frame elements of entity-specific change-of-state verbs will be critically examined and we will show whether they can operate or not as predictors of the syntactic representation of verbs. The LCM admits that every lexical unit is associated with world-knowledge information and even formulates a constraint, i.e. Internal Variable Conditioning, which stipulates that the background frame of a predicate can place restrictions on the nature of both the predicate and its constructional arguments. For example, the verb *glow* rejects the causative construction (cf. **I glowed the light bulb/I caused the light bulb to*

glow) because our world knowledge tells us that great heat that emanates from a light bulb prevents a person from manipulating the light emitter.

Concerning the corpus of description, González-García & Butler (2006: 62) argue that in theory Fillmore & Kay reject ready-made data by placing emphasis on “how language is actually used in real communicative contexts” (Fillmore & Kay 1995: 13) and on native-speaker intuitions. Nevertheless, the use of corpus data in the works of these authors is rather scarce.

Lastly, Fillmore’s model has been implemented computationally in the form of the FrameNet project developed by Fillmore and his colleagues at the International Computer Science Institute in Berkeley. This database indeed uses a corpus of naturally occurring data, i.e. the British National Corpus. One of the strengths of the model adopted for this dissertation is its computational implementation aspect. The LCM has been integrated into an Artificial Intelligence project named FunGramKB (Periñán & Arcas 2004, 2005, 2006, 2007ab, 2008ab; Mairal & Periñán 2009ab; Periñán & Mairal 2009, 2010). The difference between FunGramKB and FrameNet is that the former has developed a fully-fledged architecture whose modules are interrelated in such a way that the computer can reason on the base of the knowledge coded in them. However, this is not the case with FrameNet.

2.3. Lakoff’s (1987) constructionist approach

In his seminal work *Women, Fire and Dangerous Things*, Lakoff (1987) provides a case study of ‘there-constructions’ which has later on become a source of inspiration for CxG practitioners, such as Goldberg (1989, 1992, 1995, 2006) and people working within the LCM, such as González-García (2009, 2012) or Luzondo (2011). The LCM

coincides with Lakoff's (1987) constructionism on the following aspects: (i) syntax is not independent of lexicon; what is more, they form a continuum; (ii) in line with previous work by Bolinger (1968), linguistic form is motivated and can also be predicted on the basis of semantic meaning; this also entails that syntactic difference correlates with semantic or pragmatic difference (see also Givón 1989); (iii) grammatical constructions can be conceived as instances of radial categories which have a central member and various non-central members related to the central one through different kinds of links, either metaphoric or metonymic.

Lakoff (1987: 467) defines a construction as “a form-meaning pair (F, M), where F is a set of conditions on syntactic and phonological form and M is a set of conditions on meaning and use”. Given the fact that this is probably the first definition of a construction within Cognitive Linguistics, nothing is said about the question of (un)predictability. In contrast to previous formal approaches to ‘there-constructions’, Lakoff (1987) stresses that ‘there-constructions’ are not mere stylistic variants of simple sentences (cf. *Harry comes here* vs. *Here comes Harry*), but rather pairings of form associated with semantic and pragmatic properties. In his study, Lakoff (1987: 482-483) shows that the deictic there-construction (e.g. *There's Mary with the red hat on*)⁶ is the central category which has ten (non-central) extensions: (i) perceptual deictic (e.g. *There's the beep*); (ii) discourse deictic (e.g. *There's a nice point to bring up in class*); (iii) existence deictic (e.g. *There goes our last hope*); (iv) activity start deictic (e.g. *There goes Mary, meditating again*); (v) delivery deictic (e.g. *Here's our pizza, piping hot!*); (vi) paragon (e.g. *Now there was a real ballplayer*); (vii) exasperation deictic (e.g. *There goes Harry again, making a fool of himself*); (viii) narrative focus deictic (e.g.

⁶ The term *deictic* makes reference to words like *this* and *that* that are employed for pointing or that can be interpreted relatively to the context in which a sentence is uttered. In the sentence *There's Mary with the red hat on*, the adverb *there* indicates a location relative to the speaker.

There I was in the middle of the jungle...); (ix) new enterprise deictic (e.g. *Here I go, off to Africa*); (x) presentational deictic (e.g. *There on that hill will be built by the alumni of this university a ping-pong facility second to none*). The perceptual, discourse and existence deictic constructions are but metaphorical extensions from the central spatial deictic, where the physical space is mapped onto perceptual and discourse space, and existence respectively. Thus, the perceptual deictic construction which refers to a location in a non-visual perceptual space at a present time or in the recent past is motivated by the following cluster of conceptual metaphors: NONVISUAL PERCEPTUAL SPACE IS PHYSICAL SPACE, PERCEPTS ARE ENTITIES, REALIZED IS DISTAL, for the expression *There goes the alarm clock*; SOON-TO-BE-REALIZED IS PROXIMAL, and ACTIVATION IS MOTION, for *There comes the beep*, in which the activation of a signaling device is conceptualized as motion.

Lakoff's (1987) idea of organizing constructions as hierarchically structured classical categories was further pursued by Goldberg (1989: 81; 1992: 56), who elaborates a polysemous network for the ditransitive construction, as will be shown in greater detail in section 4.3. Within the LCM, González-García (2008, 2009, 2012) and Luzondo (2011) have studied in detail the *subjective transitive* construction and the *resultative* construction, respectively, as families of constructions. González-García (2012) claims that the central constructional meaning of the subjective-transitive construction is 'X (NP1) expresses a direct/personal/forceful involvement over Y (NP2 XPCOMP)'. There are four main subconstructions:

- (i) The *evaluative subjective transitive* construction, which selects verbs denoting "mental processes" in the sense of Halliday (1985: 116-118), including the domains of "affection, perception and cognition" (e.g. *believe, think, find, consider; I find it hard*). This construction involves a subjective, personal

assessment on the part of the subject (a person) about an entity (either a thing or a person) on the basis of first-hand evidence.

(ii) The *declarative subjective transitive* construction combines with verbs of saying and communication, such as *call, name, label, declare*, etc. (e.g. *They call him vain and arrogant*). The subject/speaker of this construction expresses a personal, direct, and fully-committed verbalization which ascribes a given property to a (human or non-human) entity.

(iii) The *causative-volitive subjective transitive* construction fuses with verbs of volition, such as *want, order, wish, need*, etc. (e.g. *Bosses want their employees weak*). This construction encodes a strong, direct/indirect, target-oriented manipulation by the subject/speaker of the situation contained in the complement clause.

(iv) The *generic subjective transitive* construction selects verbs of liking and preference, i.e. *like, wish, prefer, fancy*, etc. The subject of this construction expresses a general preference in definite, categorical terms. The verb *like* is licensed into the subjective transitive construction (e.g. *I like my meat rare*) by a high-level metaphor whereby a mental process of a non-cognitive kind (affective) can be seen as if it were of a cognitive kind (e.g. *consider*).

Luzondo (2011: 219-236) divides resultatives into two major classes: (i) *non-motional property* resultatives, and (ii) *motional* resultatives. The first group can be further subsumed into canonical resultatives (e.g. *John hammered the metal flat*, where the object does not experience a conspicuous change) and resultatives based on the high-level metaphor AN ACTIVITY IS AN EFFECTUAL ACTION (e.g. *Paula drank herself silly*). The second group, which is more productive, includes the following

constructions: (i) canonical caused-motion construction (e.g. *She imbibed the poison into her stomach*); (ii) resultative based on a high-level metaphor AN ACTIVITY IS AN EFFECTUAL ACTION (e.g. *Robert drank himself to death*); (iii) way-construction, which is licensed by the high-level metonymy MEANS/MANNER FOR ACTION FOR RESULT (e.g. *They ate their way into oblivion*); (iv) resultative based on the low-level metaphor STATES ARE LOCATIONS (e.g. *The dog chewed the bones to pieces*); (v) material/product construction (e.g. *John carved the piece of wood into a toy*); and (vi) total transformation construction (e.g. *The witch turned the prince into a frog*). These last two constructions are motivated by the high-level metaphors A CAUSED CHANGE OF STATE IS CHANGE OF LOCATION and CHANGING IS MOVING (for the causative variant) in conjunction with CHANGES OF STATE ARE SELF-INSTIGATED CHANGES OF LOCATION (for the intransitive variant). Some of these explanatory tools will be taken up again for the analysis of entity-specific change-of-state verbs which participate in the intransitive resultative, resultative, caused-motion and way-constructions.

2.4. Langacker's Cognitive Grammar (CG)

According to Taylor (2003: xi) Langacker's CG is "the most comprehensive, and most fully articulated statement of a Cognitive Linguistics approach". For Langacker (1991b: 12) communication occupies a central role in language given that "[W]hen we use a particular construction or grammatical morpheme, we thereby select a particular image to structure the conceived situation for communicative purposes". As part of cognition, language cannot be separated from the rest of cognitive abilities, such as perception, attention, or categorization (cf. Langacker 1998: 1). CG and the LCM agree mainly on the following issues:

- (i) The existence of a continuum between lexicon and grammar (cf. Langacker 1998: 35, 1999: 122, 2005).
- (ii) The meaningfulness of grammar. Langacker (1996: 52) considers that “all valid grammatical constructs are attributed some kind of conceptual import”.⁷
- (iii) The importance accorded to the notion of grammaticality (or ‘conventionality’, Langacker 1991b: 16) and well-formedness (Langacker 1991b: 14). In addition, González-García (2012: 1323) shows that within the LCM grammaticality can be understood in terms of “a cline of varying degrees of acceptability which are more likely than not sensitive to the exigencies of the context, broadly construed”.
- (iv) A broader view of the notion of construction which comprises idiosyncratic form-meaning pairings as well as fully transparent or compositional constructs with a high degree of frequency.
- (v) The importance assigned to non-classical categorization (the basic cognitive process of imposing structure and order onto our experiences) and construal (this term, which was borrowed by Langacker from psychology, refers to the process whereby people give certain interpretations to real life situations).

Langacker’s CG has given rise to some controversy since it tries to reduce lexicon and grammar to assemblies of symbolic structures.⁸ For Langacker (1987: 12) lexical units, as well as morphological and syntactic structures, can be regarded as symbolic. A symbolic structure is a pairing of semantic structure (indicating the conceptual content and the construal imposed on that content) and a phonological structure (cf. Langacker

⁷ Langacker (2011) proposes a coherent framework of a semantically-motivated grammar which is based on two main functions: semiological and interactive. The first serves to encode a negotiable proposition whereas the second has the role of negotiating the validity of a proposition. He applies this model to English auxiliaries, which predicate the existence of a negotiating relationship by the interactive system.

⁸ Langacker adopts a symbolic view of grammar according to which all elements, structures and constructs used in grammatical description are meaningful.

2005: 164). By construction, Langacker (1987: 57-63) understands “conventional *symbolic units*” and he enriches Goldberg’s (1995) notion of construction since his form pole encompasses syntactic, morphological and phonological properties. The meaning pole includes properties of the situation depicted by the utterance, properties of the discourse and information about the pragmatic situation of the interlocutors. A construction has a foregrounded element (the *composite structure*) and background elements (the *component structures*). The component and composite structures are linked by a symbolic correspondence and by relationships of categorization and the former is internal to the construction. In his opinion any symbolically complex expression⁹ can be seen as a construction and that is why complex lexical items and syntactic structures are also grouped in this category:

Grammar resides in patterns for combining simpler symbolic structures to form progressively more complex ones. Any such combination is referred to as a construction. It consists of two or more component structures that are integrated to form a composite structure (Langacker 1991a: 5).

Symbolic units differ in their degrees of specificity/schematicity, entrenchment and complexity. For example, an assembly is characterized by a certain degree of symbolic complexity and a certain degree of specificity at the semantic and phonological poles. Grammatical markers are phonologically specific and schematic at the semantic pole, whereas grammatical classes and constructions are schematic at both the semantic and phonological pole. Moreover, he introduces the notion of *constituency* which he defines as “the sequence in which component symbolic structures are progressively assembled

⁹ Symbolic complexity has been defined as “the number of constitutive symbolic elements [that an expression] contains: *sharp* → *sharpen* → *sharpener* → *pencil sharpener* → *electric pencil sharpener*” (cf. The Oxford Handbook of Cognitive Linguistics 2007: 427). Thus, the morpheme *sharp* is minimal whereas *sharpen*, *sharpener*, *pencil sharpener* and *electric pencil sharpener* are progressively more complex.

into more and more elaborate composite expressions” (Langacker 2002: 28). By treating highly frequent configurations which are compositional as constructions, Langacker (2005: 139-143) led Goldberg to enlarge the definition of a construction and to abandon the non-predictability requirement (cf. Goldberg 1995: 4). Contrary to what Langacker does, Goldberg’s constructions incorporate aspects of information structure such as topic and focus within the function pole. Nevertheless, if for Goldberg the aspects of interpersonal structure are not central to her model, for Langacker modality and speech acts are of vital importance (cf. González-García & Butler 2006: 39-96). In contrast with Goldberg, who rejects transformations, Langacker uses them to represent the connections between different conceptualizations (Langacker 1987: 138).

Both CG and the LCM are usage-based models but they differ in two respects:

- (i) The focus on lower-level configurations (i.e. exceptional item-specific schemas). For Langacker (2000: 3) “lower-level schemas, expressing regularities of only limited scope, may on balance be more essential to language structure than high-level schemas representing the broadest generalizations”. For the LCM low-level expressions and high-level configurations are equally important.
- (ii) The frequency of occurrence. The LCM does not rely heavily on this notion, since a given lexical unit can be meaningfully used by a speech community without being highly frequent.

In section 4.3.2, we will show that Langacker’s (1991a: 13-14) distinction between the ditransitive and the dative constructions in terms of focal prominence (i.e. the former focalizes the possessive relationship between a recipient and an entity whilst the latter focuses on the trajectory followed by the transferred entity) is too generic to account for all the verbs that can be subsumed into these two constructions. For instance, we cannot say that the verb *contribute* selects the dative construction and not the ditransitive one

only because it is more compatible with the destination-beneficiary perspective. We contend that subsumption processes cannot be explained by relying exclusively on the conceptual import of constructions, since verbal semantics also plays a role in determining constructional arguments.

2.5. Goldberg's CxG

The Goldbergian approach (1995, 2006) is crucial to our research since this dissertation centers on the incorporation of lexical predicates into argument structure constructions of the kind proposed in her work.

It is worth pointing out that Goldberg postulates two different definitions of construction. The original formulation of construction is found in her 1995 monograph *A Construction Grammar Approach to Argument Structure*:

C is a construction iff_{def'n} is a form-function pair, such that some aspect of the form or some aspect of the function is not strictly predictable from C's component parts. (Goldberg 1995: 205)

The second definition, provided in Goldberg (2006), which refines the 1995 version, is a usage-based one:

Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency (Goldberg 2006: 5).

Goldberg's (1995) understanding of the notion of construction is based on the definitions initially supplied by Lakoff (1987) and Fillmore (1988). The Lakoffian definition made emphasis on the pairing of form and meaning, while Fillmore focused his attention on the non-compositional nature of constructions.

Fillmore (1988) distinguished between substantive idioms or lexically filled expressions (e.g. *take x to task*, *by the skin of x's teeth*, *hit the nail on the head*) and formal idioms, which contain fixed and variable elements (e.g. *What's X doing Y?*, *The X-er*, *The Y-er*, *X Let Alone Y*). In his opinion only the latter can be regarded as grammatical constructions since they are unpredictable. However, as rightly noted by Schönefeld (2006: 26), this definition is in sharp contrast with Goldberg's contention in favor of the inseparability between lexicon and syntax. If constructions comprise both lexical and syntactic elements, can we really relegate unpredictable, idiomatic expressions to the syntax? Also, as remarked by Mairal & González-García (2010: 130-133) the criteria of idiosyncrasy and non-compositionality are vital in Goldberg's original definition of construction. Thus, the caused-motion meaning of the sentence *He gazed me out of the club* cannot be ascribed to the intransitive verb *gaze* that is usually accompanied by the preposition *at* or to the sum of the parts forming the construction. Goldberg (1995) would claim that this meaning is supplied by the inherent semantics of the construction. We could not agree more on this assumption, but we wonder on what grounds it is possible for the caused-motion construction to attribute a caused-motion interpretation to this specific verb and not to another (cf. **He described/persuaded me out of the club*). Baicchi (2011: 162) states that the perception verb *gaze* undergoes a process of subcategorial conversion (i.e. it shifts from an intransitive to a transitive configuration) which is licensed by the high-level metaphor AN EXPERIENTIAL ACTION IS AN EFFECTUAL ACTION. Owing to the increasing importance of usage-based models such as Langacker's Cognitive Grammar and Croft's Radical Construction Grammar, Goldberg (2006: 214-215) refines her perspective on constructions in that she accepts the incorporation of fully predictable patterns like *How are you?* or *Have a nice day* under the heading of constructions with the condition of high frequency (cf. Langacker

2003a). Goldberg also admits in a recent interview that empirical evidence prompted her to include the compositionality criterion as a requirement of the notion of construction:

[The definition of a construction] is only broadened from my 1995 definition insofar as I now explicitly allow for fully compositional constructions. In 1995, I focused on non-compositionality for purely methodological reasons: we know we need a construction when it's not strictly predictable. *Since then psycholinguistics has provided evidence that we store forms, even if they are compositional.* Exactly how much exposure is required before we can say something is "stored" is a topic I'm very interested in (Gurevich and Goldberg, forthcoming; Casenhiser & Goldberg, 2005; Boyd *et al.*, to appear). (González-García 2008: 352-353, emphasis added to the original)

Moreover, Chafe (2000) argues directly against Goldberg's (1995) approach on the grounds that her analysis is not based on a corpus of authentic data. He affirms that "such interpretations must in the end involve prosody, givenness and newness, and discourse context, none of which Goldberg mentions" (Chafe 2000: 11). That is why Goldberg tries to make room for different facets of information structure such as topic and focus, as well as pragmatic and discourse information which she incorporates within the function pole of constructions:

In addition to semantic generalizations there also exist generalizations about 'information structure' properties of the construction, or the way in which a speaker's assumptions about the hearer's state of knowledge and consciousness at the time of speaking is reflected in surface form. In particular, there is a statistically reliable tendency for the recipient argument to have already been mentioned in the discourse (often encoded by a pronoun) as compared with prepositional paraphrases [9, 34, 35]. Facts about the use of entire constructions, including register (e.g. formal or informal), dialect variation and so on, are stated as part of the construction as well. Because they specify a surface form and a corresponding function, constructionist approaches provide a direct way of accounting for these facts. (Goldberg 2003: 221)

Goldberg (2006) also relies on information-structure notions such as focus, topic, and backgrounded elements to make such claims as the following: subject constituents,

definite relative clauses, complements of manner-of-speaking and factive verbs, and parentheticals should be considered *islands*;¹⁰ direct replies and exclamative *ah!* are sensitive to islands; and the recipient argument of a ditransitive has a wider scope than the theme argument. Another piece of criticism that has been voiced against Goldberg's (1995) model is the lack of connection between language and social situation (cf. González-García & Butler 2006: 58). However, as will be highlighted in section 4.3.2, Goldberg's (2005a) *deprofiled object construction* (e.g. *She gave/contributed/donated [money] to the Leukemia Foundation*) can be motivated by politeness reasons (i.e. it is not polite to mention the amount of your donations).

Additionally, Goldberg (2006) discusses the interaction of multiple constructions and their contribution to the meaning and the word order of an utterance. In the sentence *What did he give to his mother?*, which she treats as a case of the caused-motion construction, the caused-motion pattern only provides the meaning of an entity causing another entity to move, whereas the *wh*-question construction contributes the *Subject Auxiliary Inversion* and the initial position of the *wh*-item. Unlike Langacker, who considers that constructions must be complex, Goldberg's notion of construction ranges from morphemes and words to sentences as can be observed in Table 2.1 below:

¹⁰ Islands are backgrounded constructions, that is to say, they are part of presupposed clauses. The definite relative clause *He read the book that Sarah loaned him* implies the presupposition that Sarah loaned him the book.

Morpheme	e.g. pre-, -ing
Word	e.g. avocado, anaconda, and
Complex word	e.g. daredevil, shoo-in
Complex word (partially filled)	e.g. [N-s] (for regular plurals)
Idiom (filled)	e.g. going great guns, give the Devil his due
Idiom (partially filled)	e.g. jog <someone's> memory, send <someone> to the cleaners
Covariational Conditional	e.g. The Xer the Yer (e.g. the more you think about it, the less you understand)
Ditransitive (double object)	e.g. Subj V Obj ₁ Obj ₂ (e.g. he gave her a fish taco; he baked her a muffin)
Passive	e.g. Subj aux VP _{pp} (PP _{by}) (e.g. the armadillo was hit by a car)

Table 2.1. Examples of constructions varying in size and complexity (extracted from Goldberg 2006: 5)

Goldberg does not deny the importance of verbal semantics in predicting the meaning of an expression but instead she adds that constructions constitute better predictors of the overall meaning of a given utterance. In this connection, Eddington & Ruiz de Mendoza (2010: 7) show that sometimes verbal semantics can be more powerful than the constructional meaning. For example, in the sentence *The prince envied him his fortune* the transfer interpretation of the ditransitive construction is cancelled out by the verb *envy* which involves no transfer. Goldberg (1997: 384-385) offers two main reasons in favor of constructional meaning:

- (i) The avoidance of implausible verb senses. Consider the sentences *Susan sneezed the foam off the cappuccino* and *She sneezed herself silly*, in which the verb *sneeze* is employed. Verb-based (projectionist) approaches (e.g. Rappaport Hovav & Levin 1998; Jackendoff 1990) would explain the difference between these sentences by postulating two special senses of the verb *sneeze*, such as ‘to cause an entity to move by sneezing at it’ and ‘to cause a resultant state by sneezing’. However, constructionist approaches only postulate one generic meaning for this verb, i.e. ‘to expel air through the nose violently and

involuntarily'. The causal meaning present in both sentences (with focus on the motional aspect in the first sentence and the result achieved by sneezing in the second one) is contributed by the caused-motion and the resultative construction, respectively. In contrast to lexicalist accounts which rely on lexical polysemy, CxG opts for constructional polysemy where the same form is paired with different but related senses of various levels of specificity. These meanings are linked by categorizing relationships to form a network centered on a prototype;¹¹

(ii) Empirical evidence supporting the existence of constructions. Thus, Landau & Gleitman (1985) contend that children determine the meaning of a verb by paying attention to the syntactic frames used with that verb (see also Naigles 1990, 1995; Naigles *et al.* 1993). More recently, Goldberg has demonstrated, through experimental evidence from language processing, and/or acquisition and aphasia, that constructions are endowed with real psychological status (see Bencini & Goldberg 2000; Goldberg, Casenhiser & Sethuraman 2004, *inter alios*). Within the LCM, Eddington & Ruiz de Mendoza (2010) have provided further empirical evidence for the psychological adequacy of argument constructions based on a priming experiment which has shown that prior exposure to sentences with a given construction speeds up the subsequent recognition of a sentence based on such a construction.

Goldberg (1998: 207) also establishes a strong connection between argument structure constructions and several “general purpose verbs”, such as *put* (e.g. X CAUSES Y TO MOVE Z, caused-motion), *make* (e.g. X CAUSES Y TO BECOME Z, resultative), *go* (e.g. X MOVES Y, intransitive motion), *do* (e.g. X

¹¹ In relation to this, Goldberg (1995: 31) argues for constructional polysemy since in her words constructions are “typically associated with a family of closed related senses, rather than a single, fixed abstract sense”.

ACTS ON Y, transitive), *get* (e.g. X ACQUIRES/POSSESSES Y, possessive). Children learn these verbs first and use them frequently. In this light, Goldberg, Casenhiser & Sethuraman (2003) claim that high frequency of tokens facilitates the acquisition of constructional meaning. It is this particular scientific finding that caused Goldberg (2006: 5, emphasis added to the original) to define a construction as a “*learned* pairing of form with semantic or discourse function”. Lastly, experiments with “nonce” words carried out by Ahrens (1995) and, later on, Kaschak & Glenberg (2000) have demonstrated that people rely on constructional meaning to understand novel verb forms. Thus, a sentence like *She mooped him something* was interpreted by 60% of the subjects as a case of a ditransitive construction- cf. “give” (Ahrens 1995). Similarly, the sentence *She crutched him the ball*, which uses an inexistent verb derived from the noun *crutch*, is assigned a successful transfer meaning achieved by means of an instrument, i.e. a crutch (cf. Kaschak & Glenberg 2000).

Goldberg’s (1995, 2006) formulations of constructions have been criticized for being too broad and underspecified:

Judging from the frequency and variety of uses attested in recent linguistic research, almost *anything* can be referred to as a ‘construction’. The term seems to have become immensely popular, if not overused, and its denotation has, consequently, become quite unclear and fuzzy. (Östman & Fried 2004: 1, emphasis in the original).

At the end of the book, it even remained unclear to me what kind of an object a construction is according to Goldberg [...] The concept of “any linguistic pattern” is not well-defined. Linguistic patterns can be (partial) strings, (partial) phrase-structures, (partial) dependency structures, (partial) attributive-value matrices [...]. I doubt whether these are all taken as constructions. However, there is also a more precise definition of construction in the book: a “form-meaning pairing”. But then, is a construction a pairing of strings, a function from a string to a predicate-argument structure, or yet something else? (Bod 2009: 130).

Ruiz de Mendoza (personal communication, 2012) has opted for a definition of a construction which disregards frequency criteria since frequency is a relative concept and usage-based proponents have not so far determined upper or lower frequency limits for a form-meaning pairing to be considered a construction. In the LCM a form-meaning pairing is a construction provided that it complies with the following criteria: (i) it must have psychological reality, i.e. speakers of a language make productive use of it for communicative purposes, whether consciously or not; (ii) it must be accepted as a meaningful unit by speakers of a language, viz. it has to be conventional and (iii) form and meaning have to be related in such a way that form affords access to conventional meaning, which is conventionally realized by such form. As a result of these three criteria, the following definition holds within the LCM: A construction is an entrenched or conventionally accepted form-meaning pairing in any degree of complexity, where form is a cue to meaning and where meaning is realized by form.

In line with Fried & Östman (2004: 23), we are especially concerned with: (i) the ways in which constructions can interact with others, and (ii) the ways in which given lexical items (in our case verbs) are built into constructions.

Goldberg (1995: 3-4) subsumes English argument structure constructions under five different headings:

- (1) Ditransitive → X CAUSES Y TO RECEIVE Z
Paul sent Joe a package (Subj V Obj₁ Obj₂)
- (2) Caused-motion → X CAUSES Y TO MOVE Z
She sneezed the napkin off the table (Subj V Obj Obl)
- (3) Resultative → X CAUSES Y TO BECOME Z
She kissed him unconscious (Subj V Obj Xcomp)
- (4) Intransitive Motion → X MOVES Y

The fly buzzed into the room (Subj V Obl)

(5) Conative → X DIRECTS ACTION at Y

Sam kicked at Bill (Subj V Obl at)

These constructions, which comprise argument roles (e.g. agent, patient, recipient, result-goal, etc.), are based on the *Scene Encoding Hypothesis*, which stipulates that “constructions that correspond to basic sentence types encode as their central sense event types that are basic to human experience” (1995: 39). Thus, transfer, caused change of location, and caused change of state designate basic scenes derived from human experience (cf. also Fillmore 1968; Langacker 1991a). Goldberg’s perspective is tightly connected to Langacker’s *conceptual archetypes*, which are regarded as gestalt conceptions that represent salient aspects of our daily experience and which are fundamental and highly frequent (e.g. an object moving through space, exerting force to achieve a desired change, etc.). The verbs that will be analyzed in this dissertation (e.g. entity-specific change-of-state verbs and *contribute* verbs) select only the first four subclasses of argument structure constructions, probably because these verbs are not easily compatible with the idea of “attempted action” present in the conative construction.

A central issue in constructionist accounts of language is the integration of predicates into constructions. In the same vein as Langacker (1991a: 331), Goldberg distinguishes between the participant roles of a verb and the argument roles of a construction. She also borrows from Langacker the notion of *lexical profiling* which helps us differentiate between verbs like *give/receive*, *buy/sell* (Fillmore 1977ab), *loan/borrow*, and *rob/steal*. In her view, participant roles of verbs “fuse” with the argument roles of constructions, which, as will be discussed below, can contribute roles not present in the lexical predicate characterizations. There are two principles that

regulate this fusion process¹² (Goldberg 1995: 50; cf. also 2002, 2005a: 8): (i) *The Semantic Coherence Principle*, which posits that there must be semantic compatibility between the participant and argument roles, and (ii) *The Correspondence Principle*, by which the participant roles that are semantically salient must fuse with grammatical relations that provide them with discourse prominence. To illustrate, consider the verbs *rob* and *steal*. According to Goldberg (1995: 45), the difference between these two verbs at the level of the lexical entry is what motivates the difference in their constructional behavior:

Rob <**thief target goods**>

Steal <**thief target goods**>

Thus, in the case of *rob* the thief and the target are compulsory elements (cf. **Jesse robbed a million dollars (from the rich)*), whereas the goods are optionally lexically profiled (cf. *Jesse robbed the rich (of all their money)*). In the case of *steal* the thief and the goods are a crucial part in the semantics of the verb (cf. **Jesse stole the rich (of money)*), whilst the target can be left unspecified (cf. *Jesse stole money (from the rich)*).

For Goldberg constructions have the property of augmenting the valence of a predicate.¹³ Let us consider the verb *kick* which is associated with two participant roles, namely kicker and kickee. When this verb is subsumed into the ditransitive construction the receiver is supplied by the construction itself (e.g. *Tim kicked John the ball*, where *Tim* and *the ball* are verbal arguments while *John* is provided by the construction). Goldberg's constructionist approach falls short in several respects. First, her explanatory apparatus places excessive emphasis on the role performed by

¹² Goldberg employs this term to refer to the relationship between the participant roles of a verb and the argument roles of a construction when these two are simultaneously instantiated by one single item. She borrowed this term from Jackendoff (1990), who uses it to make reference to the combination of two sets of semantic constraints within a given lexical entry.

¹³ In Dik's (1997: 8-15) terms this operation would be called a *quantitative valency addition*.

constructions, while the rich semantic information supplied by verbs is neglected (cf. Boas 2002). For the sake of clarity, take into account the intransitive resultative construction [...] *an army mutiny rapidly ballooned into a major political rebellion by a group of soldiers [...]* (Sketch engine doc#1151065). It may be true that the result is supplied by the construction itself but the choice of this result is greatly constrained by the information encapsulated into the metaphorical use of the verb *balloon* (i.e. the intensity of the mutiny, which may end up in a major outbreak of violence, is seen in terms of a balloon swelling to a point in which it may burst out) and by the changing entity. Therefore, the Z element (*political rebellion*) has greater meaning implications than the Y element (*mutiny*). In the LCM this phenomenon is explained by means of the constraint labeled *Internal Variable Conditioning*.

It thus seems to be the case that the division of labor between verbal semantics and constructional semantics is an issue that requires closer attention. CxG approaches diverge with respect to the sector to which the explanatory burden is assigned. Goldberg (1995, 2006) dispenses with verbal polysemy altogether by relying heavily on abstract constructional semantics, whereas lexical-constructional approaches, such as those proposed by Boas (2008ab), Croft (2003), Iwata (2005), and Nemoto (2005) prioritize verbal polysemy and verbal semantics in their analytical apparatus (see also Goldwater & Markman 2009: 679).

Second, Boas (2003: 113-116; 2008b: 120-123) argues that Goldberg's broad-scale lexical entries fail to predict the distributional pattern within a specific verbal class. For example, communication verbs exhibit similar lexical entries (e.g. talk <talker>, speak <speaker>, whisper <whisperer>, grumble <grumbler>), but they differ in their acceptability of a resultative pattern (cf. *Miriam talked/*spoke/?whispered/*grumbled herself blue in the face*, examples from Boas

2003: 120). In addition, Boas (2003: 111) shows that not all intransitive verbs can participate in the caused-motion construction even if they display the same minimal set of participant roles (cf. sneeze <sneezer>, wheeze <wheezer>, belch <belcher> etc.):

- (6) a. *The audience laughed the poor guy off of the stage.*
b. *?The audience giggled the poor guy off of the stage*
c. *??The audience smiled the poor guy off of the stage.*
d. *??The audience pouted the poor guy off of the stage.*
e. *??The audience grinned the poor guy off of the stage.*
- (7) a. *Frank sneezed the napkin off the table.*
b. *?Frank breathed the napkin off the table.*
c. *??Frank wheezed the napkin off the table.*
d. *??Frank belched the napkin off the table.*
e. *??Frank yawned the napkin off the table.*

All these cases led Boas (2008b: 125) to the conclusion that “semantic classes will have to be defined more precisely. Once this step is accomplished, it may be possible to accurately determine a verb’s range of arguments based on its semantic class membership.”¹⁴ This line of thinking (see also Boas 2006) comes close to parallel proposals within the LCM, as it is evident from Ruiz de Mendoza & Mairal (2008).

In this connection, adherents to a lexico-syntactic bottom-up usage-based approach support the inclusion of verb-class-specific and verb-specific constructions (cf. Croft

¹⁴ Iwata (2005: 389) also discusses the inaccuracy of Goldberg’s (1995) lexical entries to determine the combination of a verb with a given construction. For example, the verb *spray* is associated with the following set of participants: <sprayer **target liquid**>, where the target and the liquid are profiled roles that need to be overtly expressed (cf. The Correspondence Principle). Nevertheless, this verb can occur in a simple transitive construction (e.g. *The broken fire hydrant sprayed water all afternoon*), thus omitting the “target” participant. This is possible because the spraying event is construed as a substance emission event. Iwata (2005: 389) concludes that a refined analysis of verb meaning must “refer to the particulars of a frame semantic scene, rather than by merely matching role labels”.

2001, 2003) or Boas's *mini-constructions*, which are regarded as instantiations of Goldberg's abstract constructions. Goldberg has claimed that the function pole of a construction comprises both semantic and pragmatic information. Nevertheless, Boas (2007: 579) states that Goldberg does not examine in detail what kind of semantic and pragmatic information is necessary to determine the incorporation of a verb into a specific construction.

Another piece of criticism that has been raised against Goldberg's broad-scale generalizations is that argument structure is both construction-specific and language-specific (Croft 2003: 55-58). Goldberg (2006: 225) approves of Croft's remarks and states the following:

(...) Croft does not deny that there are generalizations within or across languages. But the generalizations that exist are determined by the functional purpose that each language's constructions serve. The present approach is in agreement with Croft's point. Variation within and across languages is embraced on the current Cognitive Construction Grammar approach. Yet at the same time, we retain the more traditional emphasis on trying to capture and motivate generalizations, imperfect though we recognize them to be. This is in fact the main theme of the present work.

Owing to a decidedly typological focus, Croft (2003: 55) is rather reluctant to admit the existence of constructional polysemy for the ditransitive construction on the grounds that "the modulation of the possessive relation specified by each constructional sense-actual, enabling, and negative transfer of possession- matches a semantic component of these verbs". He rejects true polysemy because, in his view, constructional senses are tightly connected with particular verb groups (see also Schönefeld 2006: 30).

Furthermore, Goldberg does not mention how exactly constructions combine with one another. In her own words, "constructions are combined freely to form actual expressions as long as they are not in conflict" (2006: 10). Lieven (2009: 197) notes that "(...) from a psychological point of view, the processes by which constructions are

proposed to combine are very unclear and need a great deal more theoretical and empirical work”. Also, Bod (2009: 130) concurs that Goldberg’s combinatorial procedures are rather vague: “[a]s a first informal exposition this may do, but it is not a definition of how two or more constructions can be combined”. In this regard, the LCM considers that the best option is to combine the Goldbergian formulation of CxG with lexical-constructional accounts in order to reach a finer-grained view of the division of labor between predicates and constructions.

2.6. Croft’s Radical Construction Grammar (RCG)

There are only four main points of convergence between the LCM and RCG as propounded by Croft (2001): (i) the continuum view of lexicon and grammar; (ii) a broad perspective of the notion of construction which ranges from simple words to fully schematic and regular configurations: “construction grammar has generalized the notion of construction to apply to any grammatical structure, including both its form and its meaning” (Croft 2001: 17); (iii) the importance accorded to construal and categorization (cf. Croft 2001: 104); and (iv) the role played by high frequency, together with entrenchment in constructional behavior (see Croft 2001: 28). RCG draws heavily from Fillmore’s approach and Langacker’s CG. As Croft & Cruse (2004: 288) note,

RCG is identical to Fillmore *et al.*’s CxG in handling part-whole relations between constructions; it is however like Cognitive Grammar and the Lakoff-Goldberg model in that it allows for redundant representation of grammatical information in accordance with the usage-based model.

Croft coincides with Langacker on:

- (i) The definition of constructions which are regarded as “assemblies of symbolic structure” (Croft 2001: 62) linking form and function.

(ii) The importance accorded to low-level configurations by postulating the existence of verb-class and verb-specific constructions: “there is a distinct syntactic schema for each constructional ‘sense’ specifying the verb classes found with each meaning, with corresponding specific meaning” (Croft 2003: 56). This position is endorsed by Boas (2003) and by Hampe & Schönefeld (2006), whose claims about the prevailing importance of low-level constructions in language use are grounded in empirical evidence. Whereas Goldberg’s CxG tips the balance in favor of high-level configurations, the LCM, as advanced before, gives equal importance to both low-level and high-level constructions.

(iii) The assumption of a meronymic (part-whole) structure of grammatical units. Croft also avoids decomposing the whole and treating the parts as independent units, i.e. RCG “takes the whole complex structure as basic and defines the parts in terms of their occurrence in a role in the complex structure” (Croft & Cruse 2004: 285).

In many other respects Croft adopts a radical approach, distancing himself from the rest of cognitively-oriented models:

(i) Croft is less concerned with the unpredictability and the non-compositionality principle. Instead he states that constructions are the only basic linguistic units or “primitives”. He also differentiates between “atomic substantive constructions” present in the lexicon and “complex schematic constructions” existing in the syntax.

(ii) Croft rejects Goldberg’s abstract predicates like CAUSE-MOVE in argument structure constructions (cf. also Dirven & Ruiz de Mendoza 2010: 32).

(iii) Croft’s approach (2001: 6) focuses primarily on typology: “Radical Construction Grammar explores cross-linguistic patterns in greater detail than has

been done so far in Cognitive Grammar”, thus studying “the structural diversity of all languages” (2001: 362).

(iv) Croft (2001: 4) dispenses with abstract syntactic relations, such as subject or object, since in his opinion “categories are derived from the construction(s) in which they appear” (cf. also Croft & Cruse 2004: 283). In Dirven & Ruiz de Mendoza (2010: 33) it is shown that RCG posits two poles: a semantic and a syntactic structure. For the example, the verb *give* is associated with the semantic structure of DONOR, GIFT, and RECIPIENT, whereas its syntactic structure is represented by categories at the phrase level, such as: NP₁ < Verb < NP₂ < NP₃. He denies syntactic relations between elements in a construction which are not triggered by semantic roles like agent or instrument, but by the causal relations between participants in the action. Also, Croft (2001: 35-45) argues that empty/invisible syntactic categories are language-specific, thus lacking a universal status. RCG is not compatible with the approach taken in this dissertation, since our explanatory apparatus will make use of syntactic functions such as subject, object or oblique NP.

2.7. Boas’s lexico-syntactic approach

The major point of convergence between Boas’s frame-semantic approach (Boas 2000, 2002, 2003, 2010, 2011ab) and the LCM is the meticulous interest in the lexical semantic information associated with verbs as a licensing factor of high-level constructions *à la* Goldberg. This is so because the LCM, as will be detailed in section 2.9, stems from the Functional Lexematic Model (FLM; Martín Mingorance 1998; see Butler 2009: 26), according to which “lexical representations are the key as well as the source for predicting and explaining syntactic properties” (Faber & Mairal 1999: 275).

The FLM, which has been further developed by Faber & Mairal (1999), sets out to investigate the paradigmatic structure of the lexicon by looking into semantic fields and classes and establishing hierarchical structures on the basis of similarity and difference of meaning. In this connection, Faber & Mairal (1999: 186) state that “verbs within the same subdomain have similar syntactic behavior”. This idea was also put forward by Levin (1993: 5): “various aspects of the syntactic behavior of verbs are tied to their meaning. Moreover, verbs that fall into classes according to shared behavior would be expected to show shared meaning components”. Our findings related to *contribute* verbs in section 4.3.2 are in consonance with these authors’ claims.

In line with the LCM, Boas’s frame-semantics, which is an exponent of lexical-constructional approaches, gives equal importance to low-level configurations as well as high-level constructions, as suggested in Boas (2007: 580). Iwata (2006) also reinforces the acceptance of both low-level and high-level constructions within lexical-constructional accounts since, in his view, the sole consideration of lower-level configurations in a linguistic account can lead to mere description but not to explanation.

The points of divergence between Boas’s approach and the LCM can be summarized as follows:

- (i) Unlike Boas, the LCM acknowledges the roles of metaphor and metonymy as external constraints regulating the subsumption processes between predicates and constructions, as will be outlined in greater detail in section 2.9.
- (ii) The LCM provides further levels of meaning description, not only at the argument structure level, but also at the levels of implicature, illocutionary and discourse structure. This organization allows the LCM to study the way in which constructions from lower levels are subsumed or integrated into higher-level

constructions. Also, the LCM distinguishes between *parametrizable* and *non-parametrizable* constructions. The former group comprises high-level constructions *à la* Goldberg, together with the more specific low-level structures of the kind provided by verbs. Parametrization refers to the elaboration of the high-level elements that compose a high-order construction. For example, the abstract predicates CAUSE and MOVE in the caused-motion construction (X CAUSES Y TO MOVE Z) can be elaborated by the semantic make-up of predicates like *kick*, *push*, *hit* or *throw*. The LCM considers that argument constructions abstract away elements common to a number of lower-level predicates. Thus, the caused-motion construction is the result of finding the common elements of predicates like *push*, *pull*, and *shove*, i.e. a force causes an object to change its location. Kay & Fillmore's (1999) *What's X Doing Y?* construction is a case of a non-parametrizable idiomatic construction which contains both fixed and variable elements (e.g. *What's*, *doing* are unmodifiable elements, while *X* and *Y* are highly parametrizable).

(iii) The LCM is also interested in the process of integration of constructions belonging to the same descriptive level thus giving rise to *constructional amalgams* (cf. Ruiz de Mendoza & González 2011). Consider the sentence *The train may arrive before noon*. The predicate *arrive* is incorporated into the intransitive construction (i.e. *the train arrives*) which then combines with the epistemic modality construction *X May Y*. The *X May Y* construction contains a non-parametrizable element (i.e. the verb *may*) and two variable elements, *X* and *Y*. Constructional amalgamation follows Ruiz de Mendoza & Díez's (2002) generalization on patterns of conceptual interaction, according to which more

specific configurations tend to be built into and thus enrich more abstract configurations.

(iv) Boas (2008b: 127) postulates the existence of mini-constructions which are form-meaning pairings differing in complexity from more abstract constructions. They represent particular “conventionalized senses of verbs including syntactic, semantic, and pragmatic information” and are “in principle comparable to Croft’s (2003) verb-class and verb-specific constructions”. Consider the AHTY mini-construction or ‘a hole through the Y’. There are two main verb classes that combine with this construction: Class I, which comprises verbs such as *push*, *knock*, *burn*, and *blow*, and Class II, which contains verbs like *drill*, *create*, *make*, and *dig*. The AHTY construction describes an activity carried out by an agent applying energy, where the activity causes the creation of a hole in a surface. Boas also notices that these two verb classes exhibit differences at the syntactic level. Thus, verbs in Class I require the obligatory presence of a locative PP (cf. Boas 2008a: 14-15):

(8) a. **He suggests we knock a hole.*

b. ?*He suggests we knock through the wall.*

c. *He suggests we knock a hole through the wall.*

(9) a. *Using a hammer drill and carbide bit, drill a hole.*

b. *Using a hammer drill and carbide bit, drill through the sill plate.*

c. *Using a hammer drill and carbide bit, drill a hole through the sill plate.*

Boas (2008a: 25-27) claims that the combination between verbs in Class I and the AHTY construction is regulated by the following semantic constraints: (a) the agent must be capable of emitting energy (e.g. **The book blew a hole through my desk*); (b) the emission of energy affects the physical integrity of the patient (e.g. **The water ate a hole through my glass*); (c) the patient must have a physical surface (e.g. **Jen burned a hole through the air*); and (d) the result of the activity performed by the agent must cause the creation of an opening through the entire patient (e.g. *A site must be running an NT-based firewall or must provide a hole through the firewall* is unacceptable with a creation of a hole interpretation). Luzondo (2011: 84) argues that the semantic constraints in (a) and (c) can be accounted for by the internal constraint *Predicate Argument Conditioning*, according to which the predicate can place restrictions on one or more of its arguments and can also cooperate with one of its arguments to constrain one or more of the remaining arguments. We also contend that the unacceptability of the sentence **The water ate a hole through my glass*, which was listed in (b), can be explained in terms of the *Internal Variable Conditioning* constraint, since world knowledge information related to erosion tells us that water cannot erode glass. In addition, a sentence like [...] *a gust of wind would blow a hole in the curtain giving intriguing glimpses of the surrounding moorland* (Sketch engine doc#309486) cannot receive an AHTY reading since no opening is created in the surface of the patient (cf. semantic constraint in (d) above).

Boas (2008a: 25 ft 10) admits that his analysis ignores figurative uses of AHTY (e.g. *Claire glared/stared a hole through Natasha*) because they display low productivity. However, we contend that such statement should at least be endorsed by a frequency based search of these verbs. Luzondo (2011: 84) points

out that the LCM explains these figurative usages by means of the high-level metaphor AN ACTIVITY IS AN EFFECTUAL ACTION,¹⁵ which enables us to conceive the staring look of a person as if it were able to physically affect a patient. A similar explanation holds true for a sentence like [...] *emails blew* a hole through Mr. McNulty's testimony (Sketch engine doc#201938), in which a testimony that is dismantled by further evidence is understood in terms of an object whose physical integrity has been altered.

As we could observe, Boas groups the entity-specific change-of-state verb *burn* into Class I. Boas's examples for this verb are restricted to concrete cases like *The bolt apparently hit the engine, burned* a hole through the metal casing (Sketch engine doc#792250). In this utterance the event structure configuration does not match the actual temporal arrangement of events in reality, since the result (the creation of a hole in a surface) is realized prior to the motion event that causes this result (i.e. the thunderbolt passes through the metal cover). Also, we came across examples that explore the figurative potential of this verb, e.g. *Seven furious sets of eyes burned* a hole through him (Sketch engine doc#290227). This sentence, which is licensed by the high-level metonymy PROCESS FOR ACTION (cf. Ruiz de Mendoza & Pérez 2001), expresses result (i.e. the creation of a metaphorical hole) through the use of the intransitive-motion construction, which involves a destination of motion component that maps onto the resultative element of the expression (the angry looks have the metaphorical effect of piercing a person's body). This example evidences that there is a tight causal relation between emotions and bodily experiences as suggested in Panther & Radden (2011: 4). In section 4.2.4, we provide further examples that support the intimate link between

¹⁵ The term activity makes reference to a goal-oriented activity, i.e. one where there is a target.

emotions and physiology. The sentence *The veins swelled dark on his forehead* with surcharge of passion (Sketch engine doc#667737) can be considered a case of ‘symptom-emotion’ construction, where the preposition *with* is employed to express emotional causality (see Panther & Radden 2011: 4 and Radden 1998 for a more ample discussion of the causal link between emotions and bodily reactions).

(v) Boas’s (2003) explanatory apparatus employs the notion of frame, which has been defined in section 2.2. The frame of a word comprises two components: (a) a lexical meaning or ‘on-stage’ information tending towards the lexical end of the meaning continuum; and (b) a component tending towards the encyclopedic pole of the continuum, which has been labeled ‘off-stage’ information. The first component provided us with information about the prototypical participants engaged in an event. For instance, the verb *run* includes a runner and an energetic movement from point A to point B. The periphery meaning pole of this verb contains information about the activity of running (e.g. we use our legs and feet, we consume energy, we wear shoes to run). Even if the LCM does not use words like ‘frame’ or ‘frame elements’, this model also contemplates these two meaning components of a lexical unit and their role in determining the syntactic representations of that lexical unit. The *Internal Variable Conditioning* constraint makes reference to the ‘off-stage’ information that can place restrictions on the constructional arguments of a verb. Nemoto’s (1998) lexical-constructional approach also makes a strong case for the inclusion of more detailed frame semantic knowledge within Goldberg’s high-level constructions. The verb *save* can participate in the ditransitive construction, which has different senses (e.g. *save her money* vs. *save her the trouble*). Nemoto explains this difference by

postulating three background frames for this verb: the Rescue Frame (e.g. [...] *it was a viable treatment option that could save her life*; Sketch engine doc#22425), the Storage Frame (e.g. *How could she save the food in her deep freezer?* Sketch engine doc#34509), and the Waste-Prevention Frame (e.g. *I save petrol by riding a bike to work [...]*; Sketch engine doc#815841). The Waste-Prevention ‘save’ can select a ditransitive construction (cf. *The change saved us valuable production hours*; Nemoto 1998: 232), whereas the Rescue ‘save’ cannot (cf. **The doctor saved the baby cot death*; Nemoto 1998: 234). This is so because Waste-Prevention ‘save’ involves a participant role which corresponds to a recipient role (a resource-possessor), whilst rescue save does not.

2.8. Embodied Construction Grammar and Fluid Construction Grammar

Lakoff’s (1987) original version of CxG has recently developed into what is called *Embodied Construction Grammar* (ECG; e.g. Bergen & Chang 2005). ECG and the LCM agree that the notion of construction includes linguistic units of different size ranging from morphemes and words to phrases and sentences. However, ECG differs greatly from the LCM in two respects. First, the LCM has developed two criteria to classify constructions, besides the structural one mentioned above: constructions can be idiomatic (i.e. with fixed and variable elements) or eventive (such as the ditransitive, caused-motion, resultative, and the like) and constructions can belong to different levels of meaning construction (argument structure, implicational, illocutionary, and discourse). Second, ECG focuses on language processing, more specifically language comprehension or understanding, whereas the LCM, just like the rest of Construction Grammars, places emphasis on how linguistic knowledge is modeled and represented. According to Bergen & Chang (2005) understanding a linguistic expression involves

two stages: (i) the *analysis or parsing stage*, in which the hearer maps the auditory stimulus (the sentence) onto the constructions from his/her conceptual inventory while identifying which constructions are instantiated by the linguistic expression; (ii) the *simulation stage*, during which the interpretation of the utterance activates conceptual representations or *embodied schemas* such as SOURCE-PATH-GOAL. This simulation process, together with contextual factors, determines the hearer's response.

For the sake of illustration, consider the sentence *John handed Mary the book*. During the first stage the phonetic forms are mapped onto the hearer's inventory of constructions at the morpheme, word, phrase, and sentence level. The hearer correctly identifies the ditransitive construction and its transfer semantics by mapping the participant roles onto the argument roles. At the simulation stage, the interpretation of a ditransitive construction evokes three embodied schemas: FORCE APPLICATION, CAUSE-EFFECT and RECEIVE. These conceptual representations are linked to schematic events and schematic roles like ENERGY SOURCE and ENERGY SINK (Langacker 1987). In our example *John* corresponds to the ENERGY SOURCE whilst *Mary* is the ENERGY SINK. The simulation process gives rise to an ordered set of inferences, which we reproduce below:

- (10) a. MARY does not have BOOK
- b. JOHN exerts force via HAND
- c. BOOK in hand of JOHN
- d. JOHN moves BOOK towards MARY
- e. BOOK not in hand of JOHN
- f. JOHN causes MARY to receive BOOK
- g. MARY has received BOOK

Even if these inferences might seem rudimentary in terms of deconstructing the meaning of the sentence, they are nonetheless useful in the sense that they show exactly how the comprehension process unfolds. In concert with ECG, the LCM acknowledges the existence of embodied image schemas but the computational model inspired by the LCM, i.e. FunGramKG, is not compatible with ECG. FunGramKB is more complex in its architecture and has a powerful reasoning system based on the way lexical and constructional meaning interact.

Fluid Construction Grammar (FCG henceforth) has been best described by Steels (in Bergen 2008: 340) as “a notational tool for writing down construction grammars and a computational tool for experimenting with language processing (parsing and production), learning, and language evolution”. Thus, the formalism in FCG is closely related to the one proposed in other unification-based grammars, such as Sign-based Construction Grammar by Fillmore, Kay, Michaelis and Sag (cf. Sag 2010; Michaelis 2009). It makes use of feature structures to represent the intermediary states of language processing and abstract feature structures for the representation of ‘rules’ like lexical entries and grammatical constructions. Just like Steels himself notes (in Bergen 2008: 341), this aspect differentiates his model from ECG, which employs representations based on frames and inheritance mechanisms. FCG distinguishes between two main operations: Unify and Merge. The first concerns the comparison of two feature structures. For instance, the semantic pole of a construction is compared to the semantic pole of a feature structure in production. The second operation refers to the combination of two feature structures, such as the syntactic pole of a construction and the syntactic pole of a feature structure.

The LCM and the FCG converge on two issues, namely the existence of constructions understood as form-meaning mappings and the embodiment of language. This last feature is crucial in FCG, since it carries out robotic experiments by using humanoid robots, i.e. with a human-like body, so that their conceptualizations are closer to human cognition. Steels (2004) describes the steps taken by FCG: (i) the implementation of artificial agents with components similar to human cognitive operations (e.g. introducing a new syntactic category, establishing an analogy between two events); (ii) the exposure of these agents to real-world scenes enacted by puppets which engage in motion of objects or actions such as pull, push, give or take; (iii) the participation of these agents in embodied situated language games. These games have a communicative goal (e.g. asking someone to do something, drawing attention to an object) and combine both non-verbal interaction, such as pointing or performing an action, with verbal interaction. The aim is to see how these agents make use of their own inventory of language constructs in games, how language evolves in a population, how different fields of linguistics interact (e.g. pragmatics, semantics, lexicon, syntax), and how agents build up and acquire their own lexico-grammar through interaction. For example, Steels (2004) claims, on the basis of robotic experiments, that the process of language learning involves the invention of new words, and the use of abduction and induction.

2.9. The Lexical Constructional Model

This section provides an outline of the Lexical Constructional Model (LCM). The LCM combines insights from functionalist approaches to language, like Functional Grammar (FG; Dik 1997), Systemic Functional Grammar (SFG; Halliday & Matthiessen 2004) and Role and Reference Grammar (RRG; Van Valin & La Polla

1997; Van Valin 2005), with compatible developments in the Lakoffian branch of Cognitive Linguistics (Lakoff 1987, 1993; Lakoff & Johnson 1999) with special emphasis on the constructionist approach to grammar (e.g. Goldberg 1995, 2006).

The theoretical apparatus of the LCM is extracted from previous lexicalist work carried out by Faber & Mairal (1999) and Mairal & Faber (2002, 2005, 2007) and from Cognitive Model Theory, as developed by Ruiz de Mendoza and his associates in Ruiz de Mendoza & Pérez (2001), and Ruiz de Mendoza & Díez (2002). According to LCM proponents, this integration of elements from other accounts is necessary since there is no approach (e.g. RRG or Goldberg's CxG) that can provide by itself a fully adequate explanation of all aspects of meaning construction. For functionalists constructions cannot wholly determine the morphosyntactic structure of a predicate, whereas constructionist models postulate that only constructions are the overall determinants of sentence meaning, thus overlooking the active role of verbal semantics, as has also been observed by Boas (2008ab), Iwata (2008), Coleman (2009), and Coleman & De Clerck (2008), who supply finer-grained verbal semantics analyses than other constructionists.

The building blocks of the LCM are: *lexical templates* (LTs) and *constructional templates* (CTs). Lexical templates are low-level constructional representations of the semantic and syntactic properties of a predicate. They are made up of a *semantic module*, which captures the semantic and pragmatic parameters of predicate meaning, and the *Aktionsart module*, which is based on the RRG logical structures and an inventory of semantic primes. In turn, constructional templates are considered to be high-level representations of the semantic properties of constructions and, since they operate at all levels of the LCM (e.g. argument structure, implicational, illocutionary and discursive), we can affirm that constructional templates “coerce” lexical templates which operate only at the argument-structure level. RRG logical structures, which lie at

the basis of lexical templates, have been compared to the semantic frames used in FrameNet, an important application of Construction Grammar frames (Atkins, Fillmore & Johnson 2003; Fillmore, Johnson & Petrucci 2003). It is worth noting that although lexical templates have borrowed RRG logical structures they do not limit themselves to the argument structure of a verb, since they have also added an enriched semantic representation which specifies the semantic parameters that distinguish one verbal predicate from another included in the same domain (cf. Jiménez & Pérez 2008; Jiménez 2009). The logical structures give us information about the grammatically salient features of a word meaning while the semantic module, which deals with semantic and pragmatic parameters, brings lexical templates closer to semantic frames. However, what differentiates lexical templates from frames is that only the former make use of a semantic metalanguage based on *Aktionsart* distinctions (Vendler 1967; Van Valin 2005), a set of semantic primitives, and a number of combinatory rules. Both the LCM lexical templates and frames display inheritance relations, roles and participants, and can be considered schematic representations of world-knowledge. However, inheritance in the LCM is dependent on its lexematic-oriented taxonomies. Thus, unlike semantic frames, lexical templates are connected through domain-subdomain hierarchies, which endows the internal description of lexical templates with a high degree of systematization.

The LCM stands halfway between Role and Reference Grammar and constructionist models of language since, in contrast with cognitive theories, which ignore the importance of verbs and place constructions above them, it claims that verbal semantics plays an active role in determining meaning construction. It agrees with constructionism when stating that in a caused-motion construction like *They scorned him into depression* the final meaning is provided by the construction itself and cannot

be derived from the predicate-argument structure of *scorn*. Nevertheless, the LCM cannot fully embrace constructionist approaches since it is impossible for them to account for the broad array of constraints that are at work in lexical-constructional fusion, as will be shown in section 2.9.3 below.

The LCM is also concerned with the relationship between syntax and all aspects of meaning construction. In this connection, it features four levels of description, each of which deals with a set of language-based inferential and constructional mechanisms used by speakers to make meaning: level 1 deals with argument structure lexical and constructional specifications; level 2 with conventional and non-conventional implicated meaning; level 3 with illocution; and level 4 deals with discourse configurations. In the present research the focus will be primarily on level 1. The overall architecture of the LCM is displayed in Figure 2.1 below:

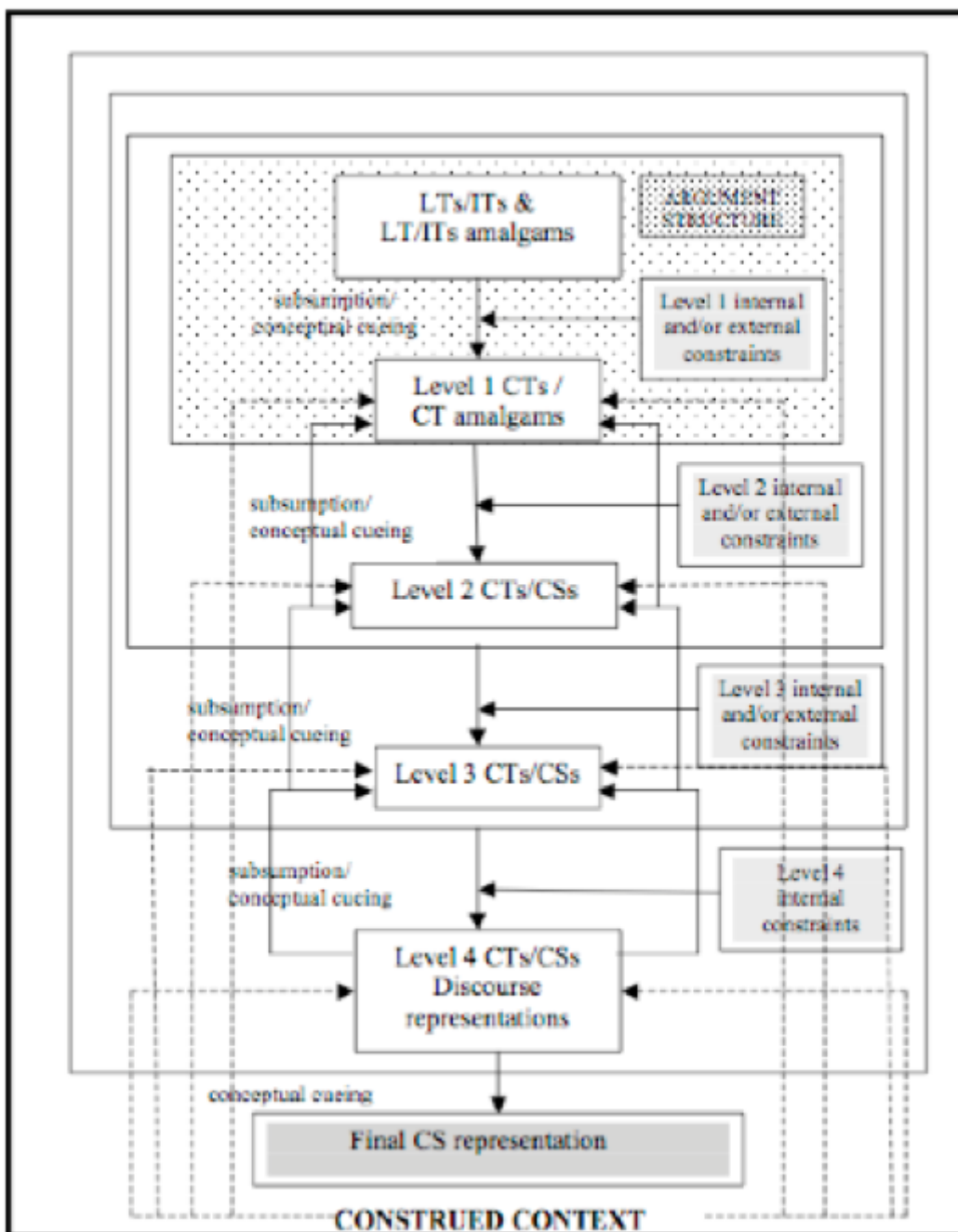


Figure 2.1 The architecture of the Lexical Constructional Model

Subsumption = the constrained incorporation of lower-level conceptual structure into higher-level configurations (as a result the higher-level structure is *parametrized*)

Conceptual cueing = the activation of an implicit conceptual structure through a lower-level explicit configuration (e.g. through *metonymy*)

In contrast to all the other levels of description, the final meaning representation only requires conceptual cueing operations that add further illocutionary, pragmatic or discourse values, such as humor, irony, exaggeration, etc. For instance, the utterance *The bomb went off; three people died* can be considered an informative statement (level 3). However, after applying the precedence and cause-consequence connections (level 4), the same sentence can be given a different illocutionary interpretation (e.g. a warning).

2.9.1. Lexical templates

This section focuses entirely on the concept of lexical template, which is, as has already been mentioned, a development of the logical structures belonging to Van Valin & La Polla's (1997) Role and Reference Grammar (RRG). RRG can be portrayed as a moderate lexicalist functionalist approach to language that opposes Chomsky's (1995) formal paradigm. Its postulates are clearly defined by Van Valin (1993: 2) as follows:

RRG takes language to be a system of communicative social action, and accordingly, analyzing the communicative functions of grammatical structures plays a vital role in grammatical description and theory from this perspective. Language is a system, and grammar is a system in the traditional structuralist sense; what distinguishes the RRG conception is the conviction that grammatical structure can only be understood with reference to its semantic and communicative functions. Syntax is not autonomous. In terms of the abstract paradigmatic and syntagmatic relations that define a structural system, RRG is concerned not only with relations of co-occurrence and combination in strictly formal terms but also with semantic and pragmatic co-occurrence and combinatory relations.

RRG, which has a solid typological orientation, is intended to account for the linguistic properties of all languages in the world. It is a monostratal theory in the sense that the

semantic and syntactic components are directly mapped without the intervention of abstract syntactic representations. RRG proposes a classification of verbs into lexical classes based on their *Aktionsart* or internal temporal properties. For this purpose, it draws insights from Vendler's (1967) own taxonomy of verbs and from Dowty's (1979) representational scheme. Vendler proposes four classes of verbs, namely *states*, *activities*, *accomplishments* and *achievements*. States and activities are regarded as primitives. The former denote static situations, which are atelic, whereas the latter are dynamic and non-telic. Accomplishments and achievements are more complex since besides containing an inherent state/activity, they also include a BECOME/INGR operator. Both of them are telic (have a terminal point) and express changes of state but they differ in that accomplishments have duration (e.g. *learn*, *recover*) whilst achievements encode momentaneous changes of state (e.g. *burst*, *pop*). Role and Reference Grammar enriches Vendler's classification by inserting a fourth type of predicate, viz. *semelfactives*, which express punctual events lacking a resultant state (e.g. *glimpse*). RRG also puts forward the notion of *active accomplishment* as an *Aktionsart* category, which appears in connection with verbs of consumption, creation and movement.

Each of the six classes of predicates above has a causative counterpart, i.e. there are causative states, causative achievements, causative semelfactives, etc. As the next contrastive example shows, the causative denotes that an external agent induces the change of state, which in the first case was something rather spontaneous:

Achievement: *The balloon popped.*

Causative Achievement: *The man popped the balloon.*

Each predicate class possesses its logical structure (LS) as illustrated below (cf. Van Valin 2005: 45):

Verb class	Logical Structure
State (see)	see' (x,y)
Activity (run)	do' (x, [run' (x)])
Achievement (pop)	INGR popped' (x)
Semelfactive (glimpse)	SEML see' (x,y)
Accomplishment (receive)	BECOME have' (x,y)
Active Accomplishment (drink)	do' (x, [drink' (x, y)]) & BECOME consumed' (y)
Causative Accomplishment (kill)	[do' (x, Ø)] CAUSE [BECOME [dead' (y)]]

Sometimes the standard logical structure (LS) description of RRG cannot explain all patterns of the grammatical behavior of verbs. That is why the LCM proposes the concept of lexical template, borrowed from Mairal & Faber (2002), which enriches Van Valin's semantic representations and enables us to predict all relevant grammatical combinatorial possibilities of a given verb.

Lexical templates make use of a universal semantic metalanguage and they contain logical structure specifications (external variables) that are bound to the internal variables which are semantic primitives and lexical functions or operators. The set of semantic primes coincides with that used in Wierzbicka's *Natural Semantics Metalanguage* (1996; Goddard & Wierzbicka 2002), whereas the operators are based on the notion of lexical function as proposed in Mel'cuk (1989, Mel'cuk *et al.* 1995). By way of illustration of what a lexical template looks like, we shall take into consideration an example of a cognition and speech act verb taken from Ruiz de Mendoza & Mairal (2008):

grasp: [MAGNOBSTR&CULM₁₂ (ALL)] **know'**(x,y)

Grasp is a state predicate with two arguments (x,y) that are linked by means of a semantic primitive (**know'**), which is the hypernym of these cognition verbs whose properties are inherited by the verb in question. MAGNOBSTR and CULM represent lexical functions, the first one describing the large degree of difficulty of the action while the second is the end-point of knowing, i.e. understanding. The numeral subscripts (1, 2) express the cognizer and the content, whereas (ALL) specifies that the content must be completely understood.

2.9.2. Constructional templates

In contrast with lexical templates, constructional templates are higher-level, non-lexical representations with a grammatical impact. In the LCM, constructional templates are not confined to the propositional level of description. They fall into four categories, each of which corresponds to one of the levels of the LCM:

- (i) level 1 involves argument structure constructions;
- (ii) level 2 is concerned with implicational constructions;
- (iii) level 3 includes illocutionary constructions;
- (iv) level 4 contains discourse constructions.

The next subsections are devoted to the examination of each construction type:

- (i) Level 1 constructions: at this level, constructional templates are tightly linked to Golberg's (1995, 2006) approach to construction types (e.g. ditransitive, caused motion, resultative, intransitive, conative, etc.). For Ruiz de Mendoza & Mairal (2008: 368) constructions are made up of a set of arguments (x-actor, y-

object of the action, z-resultant state of the object) that are connected between them on the basis of abstract predicates like CAUSE, BECOME, MOVE and HAVE. They claim that the transitive configuration constitutes the building block of some other constructions like the ditransitive, the resultative and the caused-motion construction.

(ii) Level 2 constructions: at the second level, linguistically guided inferencing (traditionally called *presupposition*) and pragmatically guided inferencing (traditionally termed *implicature*) play a key part in the explanation of the well-known *What's X Doing Y?* construction, which has been explored in detail by Kay & Fillmore (1999). Such a construction comprises compulsory or fixed elements which have been labeled as non-parametrizable (*what's, doing*) and variable or parametrizable elements (X, Y). The interpretation of the construction adds to its literal meaning (i.e. the speaker wants to know what someone is doing in a given situation) the idea that the speaker feels that there is something wrong about the situation, which is why he wants to draw the addressee's attention to it. This added meaning has become conventionally associated with the expression through a process of what Langacker (1999: 105) calls "entrenchment" or inherent ease of activation.

(iii) Level 3 constructions: the LCM agrees with previous functional grammar approaches (Dik 1997; Halliday & Matthiessen 2004) with respect to the claim that illocutionary force is coded in language by means of grammatical mechanisms (e.g. Dik states that the word *please* helps us to convert imperative sentences into requests: *Pass me the mustard, please*). However, Ruiz de Mendoza & Baicchi (2007) suggest the term of constructional conventionalization instead of grammatical derivation since sentences like **Can you write Morse*

code, please? or **Can you hear the ocean, please?* cannot possibly be interpreted as requests despite the addition of *please* and, what is more, an example such as *Can you listen to me?* has a strong default interpretation as a request which cannot be predicted from grammatical form (see also Pérez 2001, 2002).

(iv) Level 4 constructions: More attention has been focused on the famous *Let Alone* construction, which has been studied in detail by Fillmore, Kay & Connor (1988) and which can be represented as *X Let Alone Y* (e.g. *I can't even speak French, let alone Chinese*). There is an entailment type of relationship between the two variable constituents (X, Y) which, on the one hand, signals that the situation described in Y is less likely to occur than X, and on the other hand, communicates that X involves a negative state of affair. Another element which is slightly parametrizable in this construction is the conjunction *let alone* which can be replaced by *never mind* or *much less*. There are other discourse constructions that have been tackled by Ruiz de Mendoza & Mairal (2008) and Mairal & Ruiz de Mendoza (2009), namely *Just Because X Does not Mean Y* (e.g. *Just because we live in Brooklyn does not mean we are poor*), *X So Y* and *Y After All X*, in which the discourse connectors *so* and *after all* evoke the Evidence Frame.

2.9.3. Subsumption phenomena

In Ruiz de Mendoza & Mairal (2008: 377), subsumption has been defined as a “stepwise meaning production mechanism that consists in the principled incorporation of lower levels of semantic structure (captured in the form of lexical and constructional templates) into higher levels of syntactically-oriented structure”. Lexical-constructional subsumption is a basic cognitive operation that appears at all levels of meaning construction. This operation is regulated by a set of *internal* and *external constraints*.

Internal constraints, which take into account the conceptual composition of lexical and constructional configurations (i.e. their encyclopedic and event structure makeup), specify the conditions under which a lexical predicate may modify its internal configuration so that it can become a candidate for subsumption into a given construction. By contrast, external constraints, which usually take the form of high-level metaphor and/or metonymy (see Ruiz de Mendoza & Mairal 2007), determine in what way or to what extent a lexical predicate can be construed from a different perspective that may allow its meaningful integration into a given construction without altering its internal structure.

At this point it is important to elucidate what the LCM understands by the term high-level. For the LCM (cf. Ruiz de Mendoza 2007), there are three different levels of description for idealized cognitive models (or ICMs)¹⁶: primary, low and high. The primary level of description is directly grounded in sensorimotor experience (e.g. the metaphor MORE IS UP/LESS IS DOWN in *Prices are going up/down*; cf. Ruiz de Mendoza & Pérez 2011). The low level of description is a non-generic level of conceptual representation which specifies elements and their properties and relations (e.g. the metonymy INSTRUMENT FOR PLAYER in *The sax has the flu*). The high level of description makes use of generic ICMs which derive their structure from a number of low-level models.

When dealing with the integration of lexical predicates into constructions, linguists employ the term *coercion* (Pustejovsky 1993). A definition of this notion was provided by Talmy (2000: 324) as follows: “when the specifications of two forms in a sentence are in conflict, one kind of reconciliation is for the specification of one of the forms to change so as to come into accord with the other form”. Constructionist

¹⁶ Lakoff (1987) has defined an idealized cognitive model (ICM) as an organized conceptual structure, i.e. as a package of knowledge which results from the activity of a structuring principle.

approaches (Goldberg 1995) support a unidirectional view of the coercion process going from the grammatical meaning of a construction to the meaning of a lexical item. However, as shown by Panther & Thornburg (2004), coercion can work in both directions. For example, the imperative construction, which usually combines with action predicates (e.g. *Leave the country before it is too late*), can accept a stative predicate as in *Be wealthy in ten months*. The meaning of this predicate changes to fit the action meaning of the construction, i.e. ‘Do something so that you will be wealthy in ten months’ (cf. also Panther & Thornburg 2000). By contrast, a sentence like *Enjoy your summer vacation!* can receive two different interpretations: (i) an action interpretation which complies with the constructionist views, and (ii) an optative interpretation, which is grounded in a folk model that regards enjoyment as a spontaneous experiential state. In this light, the aforementioned sentence can be paraphrased as ‘I express my hope/wish that you will enjoy your summer vacation’.

A case of constrained coercion¹⁷ of a non-causative verbal predicate into a construction requiring a causative predicate is evident in the sentence *Wycliffe waved him to a seat* (BNC GW3 1996). What makes this purely intransitive verb *wave* such a proper candidate for the caused-motion construction? The subcategorical conversion process that allows the verb *wave*, which is normally accompanied by a prepositional complement **do’** (x, [**wave-at’** (x, y)]), to change into a transitive verb, and the Override Principle (Michaelis 2003)¹⁸ offer an answer to the question posed above. According to

¹⁷ In the LCM, coercion is not considered an epiphenomenon that results from the activity of other processes such as metaphorical and metonymic extensions of lexical items from a prototype, as claimed by Ziegeler (2007, 2010). The LCM position, as discussed in González (2012), is closer to the one in Harder (2010), according to which the slot properties of the components of a construction arise from the context-oriented interplay between different functional factors. This means that lexical structure has to be accommodated to (the functions of) constructional structure. What the LCM does is account for the conditions under which this process is possible in terms of constraints, metaphor and metonymy being just two kinds of constraints among a number of others (cf. Ruiz de Mendoza & Mairal 2008).

¹⁸ Michaelis (2003, 2004) is concerned with the way verbal aspect is coerced by the constructional meaning. Thus, she draws a distinction between *aspectual concord* and *aspectual shift* constructions. The

this principle, the meaning of a lexical item should adjust to the overall meaning of the structure in which it is incorporated. LCM proponents have found that this adjustment may affect the event structure characterization (sometimes called *Aktionsart* structure) of the lexical item. In the example above, the verb *wave*, which is an activity, that is, intrinsically non-causative and non-telic (i.e. it expresses no inherent final point), by virtue of its incorporation into the caused-motion construction, becomes telic and acquires a causative meaning. Following Van Valin (2005), one could argue that the verb *wave* has changed from denoting an *activity*, a dynamic, non-telic state of affairs, to denoting a *causative accomplishment*, i.e. a dynamic, telic state of affairs involving a caused change of location. However, this change is only possible to the extent that the activity predicate in question can be conceived as expressing a degree of object-directed intentionality. For example, the activity predicate *breathe* would be extremely odd in *#They breathed me into the room*¹⁹ but considerably less so in *Many kids just need to breathe themselves to sleep [...]* (Sketch engine doc#1576606). The LCM accounts for otherwise puzzling asymmetries of this kind by postulating an underlying high-level metaphor whereby one kind of object-directed action is seen as another kind of object-directed action. The difference between the two kinds of action is that the latter is an *effectual* action, that is, one in which the object is materially affected by whatever has

first illustrates a match between the values of the construction and its lexical daughter. The second refers to cases in which the construction and its lexical daughter display different values for the relevant semantic features. The frame adverbial construction is a concord construction. In the sentence *They were bored in a minute* the stative verb (*be bored*) is coerced to receive an achievement reading via the override principle. In the sentence *She was winning the race* the verb *win* undergoes an indirect type shift: the progressive form makes this verb to shift from an achievement to an activity interpretation.

¹⁹ It could be argued that some of these labels, like AN ACTIVITY IS AN EFFECTUAL ACTION, are too generic and need to be further refined. However, this is not the case if each label is defined accurately in terms of its nature and scope, as the LCM does. For example, let us consider the notion of ‘activity’ in connection to the contrasting pair *He drank himself into stupor* vs. **He drank John into stupor*. The second sentence is ungrammatical since it lacks the essential properties of a prototypical transitive pattern (cf. Hopper & Thompson 1980), namely, the intentionality and control over the action performed by the agent. What is more, the result of the activity of drinking (*into stupor*) is accidental and that is why it would be incorrect to say *#He drank himself voluntarily into stupor*. Therefore, an activity carried out by an agent can have effects on a patient only when that activity is intentional and the agent has control over the action.

come about, whereas the former is an experiential action where the object simply experiences the action but is not materially affected by it. The label for this high-level metaphor is AN EXPERIENTIAL ACTION IS AN EFFECTUAL ACTION, where the label ‘effectual action’ specifies a kind of causative accomplishment –defined by Van Valin (2005) as a dynamic, telic event where an entity causes another entity to change state– and where the label ‘experiential action’ refers to a goal-directed action. This metaphor either permits the subcategorical conversion of some other experiential action predicates such as *smile* (e.g. *She just smiled me out of court*; Sketch engine doc#657363) and *wink* (e.g. *Ms. Baack is slinkily sultry, belting and winking her way through some of the more suggestively racy numbers [...]*; Sketch engine doc#238270) or disallows others such as *shiver* (e.g. **She shivered me into the room*), depending on whether the experiential action can be object-oriented and intentional or not. While *smile* and *wink* are both intentional and object oriented, *shiver* is not. This precludes the high-level metaphor from being operational. As a result, there is no licensing factor for *shiver* to take part in the caused-motion construction.

The LCM has also postulated other high level metaphors that regulate lexical-constructional subsumption, such as A COMMUNICATIVE ACTION IS AN EFFECTUAL ACTION (e.g. *Di Caprio snarls his way through the film with an admirable sense of focus*; Sketch engine doc#325884), AN ACTIVITY IS AN (EFFECTUAL) ACTION (e.g. [...] *He let his voice caress her into sleep*; COCA 1993), and AN EMOTIONAL STATE IS AN EFFECTUAL ACTION (e.g. *He [God] will love us [...] into holiness*; Sketch engine doc#715874). Figure 2.2 illustrates the representation of lexical-constructional subsumption in the sentence *He will love us into holiness*. In this example, the verb *love*, which is a state predicate, is licensed into the

caused-motion construction by the high-level metaphor AN EMOTIONAL STATE IS AN EFFECTUAL ACTION.

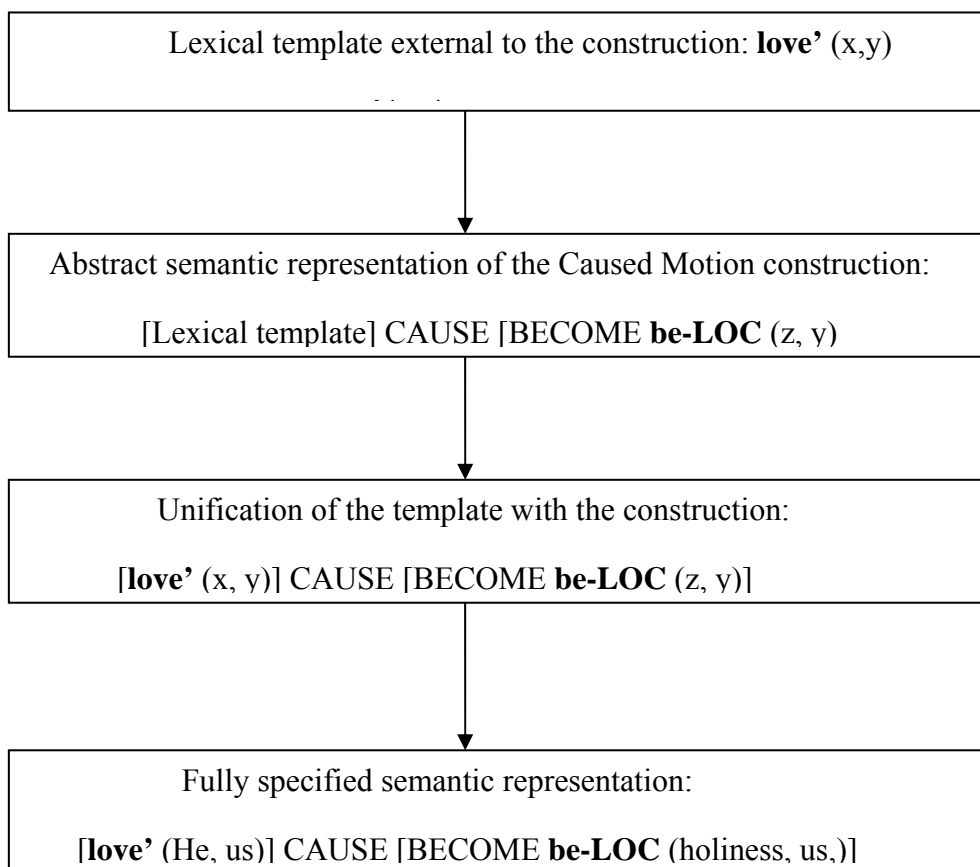


Figure 2.2 Simplified representation of lexical-constructional subsumption in *He will love us into holiness*

The elements in boldface that are followed by a prime are constants (e.g. **love'**), which are the rough equivalent of semantic primitives in other theories (e.g. Wierzbicka 1972, 1996, 2002ab; Jackendoff 1990, 1996ab; Van Valin 2005; Levin & Rappaport 2005). The template items in normal typeface (e.g. x, y) represent variables and express positions that are to be filled in by predicate arguments, in whatever degree of complexity, when building the semantic representation of individual sentences. The elements in capitals are operators (e.g. BECOME) that range over constants. In this example the two-place predicate *love* takes up an additional theme argument (z), which is not present in the semantic make-up of the verb but rather derives from its unification

with the caused-motion construction. The caused-motion construction is used figuratively. The first argument (x) becomes an effector which causes the patient (y) to move to a particular location (z). This sentence is an example of the resultative use of the caused-motion construction.

According to the classification proposed in Ruiz de Mendoza (2011), the high-level metaphors discussed above can be considered a special case of integration by combination, which is understood as an operation whereby a verb adapts to higher-order constructions by selecting structure from additional conceptual domains. Also, Ruiz de Mendoza & Mairal (2007) argue that this subcategorial process is made possible by a high-level metaphoric resemblance operation which makes us interpret one form of conceptual structure (e.g. a non-causal predicate, expressing goal-oriented activities/actions without a physical impact on an object) in terms of another form of conceptual structure (e.g. a caused-motion, resultative or *way* construction which requires a causal predicate).

In addition, the LCM has incorporated into its analytical apparatus high-level grammatical metonymies that lie at the basis of four different types of grammatical processes, such as categorial conversion, subcategorial conversion, enriched composition, and parametrization. Grammatical metonymies are high-level (non-lexical) metonymies that have consequences at the morphological and/or syntactic level.²⁰ This notion was initially formulated by Ruiz de Mendoza & Pérez (2001) and it has been refined in Ruiz de Mendoza & Otal (2002), Ruiz de Mendoza & Díez (2004), and Ruiz de Mendoza & Pérez (2004).

²⁰ The articles written within the framework of the LCM mainly focus on the influence of grammatical metaphor and metonymy on non-morphological phenomena. Nevertheless, Pérez & Díez (2005) examine the role of grammatical metonymy in Italian morphology.

Regarding categorial conversion, Radden & Kövecses (1999: 37) mention eight types of metonymies that license the nominalization of predicates and the recategorization of nouns into verbs:²¹

- (11) a. AGENT FOR ACTION: *to author a new book; to butcher the cow*
b. ACTION FOR AGENT: *writer; driver*
- (12) a. INSTRUMENT FOR ACTION: *to ski; to hammer*
b. ACTION FOR INSTRUMENT: *pencil sharpener; screwdriver*
- (13) a. OBJECT FOR ACTION: *to blanket the bed; to dust the room*
b. ACTION FOR OBJECT: *the best bites; the flight is waiting to depart*
- (14) a. RESULT FOR ACTION: *to landscape the garden*
b. ACTION FOR RESULT: *the production; the product*
- (15) MANNER FOR ACTION: *to tiptoe into the room*
- (16) MEANS FOR ACTION: *He sneezed the tissue off the table*
- (17) TIME FOR ACTION: *to summer in Paris*
- (18) DESTINATION FOR MOTION: *to porch the newspaper*

Let us consider the sentence *The policeman had a deep cut in his shoulder*. In this example, the metonymy ACTION FOR RESULT motivates the conversion of the verb *cut* into a noun (cf. also Kövecses & Radden 1998). A similar example is discussed in Ruiz de Mendoza & Peña (2008), who claim that the noun *cut* captures all the relevant elements of the action frame which can be recovered and realized linguistically (e.g. *The policeman had a deep cut in his shoulder. Who made it and using what?*, where the second sentence refers to the actor and the instrument used to perform the action).

²¹ For an exhaustive taxonomy of denominal verbs, including less conventional uses, such as *to Houdini one's way out of a closet*, the reader is referred to Clark & Clark (1979), who argue that their use is regulated by conventionality.

The utterance *There is a lot of America in what he does* is an instantiation of subcategorial conversion licensed by the target-in-source metonymy AN ENTITY FOR ONE OF ITS PROPERTIES, whereby the proper noun *America* represents American stereotyped values. Ruiz de Mendoza & Peña (2008: 264) show that this word undergoes a count-mass transformation which allows us to perceive a property as a substance.

Verbs like *enjoy* or *begin* canonically subcategorize an action as their complement (e.g. *He enjoyed/began reading the book*). Nevertheless, these verbs can be followed by a noun phrase as in *He enjoyed/began the book*. According to Jackendoff (1997), this second example cannot be interpreted compositionally but rather requires what he calls *enriched composition*. Thus, the action of reading is implicit and the meaning of *enjoy/begin the book* does not result from the combination of the meanings of *enjoy/begin* and *book*. Jackendoff (1997) explains this phenomenon in terms of an enrichment of the meaning of the nominal complement from *book* to whatever action can be performed with respect to the book. Ruiz de Mendoza & Pérez (2001, 2011) argue that this process is based on the high-level metonymy OBJECT FOR ACTION, whereby the object (the book) stands for the action carried out with this object (reading/studying/printing, etc.).

Ruiz de Mendoza (2011: 116-119) claims that the parametrization process, which is licensed by the GENERIC FOR SPECIFIC metonymy, operates within three areas: lexical genericity, propositional truisms, and semantically underdetermined expressions. The example *He whipped the horse; the poor animal broke into a trot [...]* (Sketch engine doc#283182) is a case of lexical genericity. The generic noun *animal* stands for the more specific noun *horse*, while it avoids repetition of the same lexical item which

would disrupt economy in the creation of discourse cohesiveness (cf. Hoey 1991). The sentence *He's coughing and he has a temperature* (Sketch engine doc#132457) constitutes a case of truism, i.e. a self-evident truth which is communicatively superfluous. It is obvious that people who are alive have a temperature. Nonetheless, here the generic phrase 'having a temperature' stands for a more particular situation, viz. 'having a higher-than-normal body temperature'. Lastly, the sentence [...] *Pete and Mum went to the shops* [...] (COCA) is an underdetermined expression in the sense that it can be enriched by the context, i.e. Pete and the speaker's mother could have gone to the shops either together or separately.

2.9.4. Internal constraints

All the examples provided in section 2.9.3 illustrate the operation of external constraints on lexical-constructional subsumption. In this section we present the internal constraints that regulate the integration process between verbs and constructions. The internal constraints postulated by the LCM can be divided into two groups: (i) those operating on a paradigmatic basis: *Full Matching*, *Event Identification Condition*, *Lexical Class Constraint* and *Lexical Blocking*; and (ii) constraints operating on syntagmatic grounds: *Predicate-Argument Conditioning* and *Internal Variable Conditioning*. The constraints in the first group specify the conditions that a lexical template must fulfill in order to be compatible with a particular construction, whereas those in the second group are concerned with the instantiation conditions of constructional variables. Let us discuss each one of them in turn.

The internal constraint called Full Matching states that "there must be full identification of variables, subevents, and operators between the lexical template and

the constructional template” (Ruiz de Mendoza & Mairal 2008: 385). The verb *break*, which is a causative accomplishment predicate, can perfectly combine with a transitive construction because both share the relevant structural elements, i.e. an effectual action that causes a change of state. Also, *give*-verbs naturally observe Full Matching when they are found in the ditransitive construction. Thus, in a sentence like *She gave him the wallet*, there is no constructional coercion over the lexical structure since the verb *give* has an inherent transfer meaning, which does not need to be attributed to the ditransitive construction.

A second constraint is the Event Identification Condition, which stipulates that there should be a matching between the subevents specified by the lexical template and those encoded by the constructional template. To illustrate, consider the grammaticality contrast in (19):

- (19) a. *John hit at the fence*
b. **John petted at the dog.*

In (19a) the incorporation of the verb *hit* into the conative construction is possible because both the verb and the construction have the same event structure, i.e. both have a motion and a contact subevent. However, in (19b) the verb *pet* is an activity predicate involving only a contact subevent, which prevents this predicate from being built into the conative construction. Moreover, the lexical class of a predicate can determine which verbs can take part in the causative/inchoative construction and which cannot do so. Both the verb *break*, whose event structure in the LCM takes the form **do'** (x, Ø) CAUSE [BECOME **broken** (y)], and *destroy*, which is characterized as **do'** (x, Ø) CAUSE [BECOME **destroyed** (y)], share the same lexical representation but only the first one is eligible for occurrence in the causative/inchoative construction (*The boy*

broke the window/The window broke vs. *The bomb destroyed the building/*The building destroyed*). The explanation is grounded in the fact that the verb *destroy*, unlike *break*, is not a change of state predicate but a cessation of existence predicate, which is further decomposed into NOT **exist'** (y).

A third constraint is *Lexical Blocking*, according to which one component of a lexical template can prevent the unification with a given construction if this element has a suppletive form. A clear example is provided by the verb *kill*, whose suppletive form (i.e. *die*) is an impediment for the causative/inchoative alternation to take place, as is evident from the impossibility of expressing *The tiger killed the lamb* as **The lamb killed* ('died').²²

Predicate-Argument Conditioning is another internal constraint that is at work when the lexical template determines the type of element that we can choose for a constructional argument. For example, the Y element of the caused-motion construction, which has the pattern *X-predicate-Y (NP)-Z (PP)*, is constrained by the choice of the predicate and PP (i.e. in *She sent me into despair*, the Y element is obligatorily a human verb role).

Finally, by *Internal Variable Conditioning* we make reference to cases in which the world-knowledge information associated to an internal predicate variable restricts the nature of both the predicate and the constructional arguments. A case in point is that of the resultative and caused-motion constructions in some causative uses of the verb *drive*, whose meaning tends to denote the loss of control of the object, thus predicting

²² It should be noted that it is possible to use the verb *kill* intransitively with a non-inchoative meaning through the application of what Goldberg (2006) has termed the *deprofiled object* construction (e.g. *The tiger has killed again*), where the focus of attention is on the act of killing rather than the object. This use of *kill* is not related to the Lexical Blocking constraint.

the nature of the *Z* element, which can only describe a negative mental state as in *drive someone mad, crazy, insane, wild, etc.*

The strengths of the model adopted for this dissertation can be summarized as follows (see also Butler 2009: 26):

- (i) Unlike other CxG approaches, the LCM distinguishes different levels of representation. This involves an important analytical advantage when dealing with meaning construction, which can be described as a stepwise process where lower levels of representation are either subsumed into higher levels or afford access to them inferentially.
- (ii) The LCM agrees with Boas on the importance of verbal semantics in meaning construction but acknowledges the importance of metaphor and metonymy as constraining factors licensing or blocking subsumption.
- (iii) The lexical templates proposed by the LCM are more refined than Boas's semantic frames since only the former connect semantics with syntax through the addition of logical structures, which are borrowed from RRG. Moreover, the incorporation of logical structures into lexical description provides a way to project lexical meaning into syntactic realization. This possibility is absent from Boas's approach.
- (iv) The LCM is currently being exploited in terms of computer-based implementations. The tenets of this model are compatible with FunGramKB, which is an artificial intelligence knowledge base. This project will be presented in detail in the next section.

2.10. The architecture of FunGramKB

The LCM aims to go beyond the formulation of “a set of insightful but untestable ideas” (cf. Bod 2009: 131) by fusing with an Artificial Intelligence (AI) project called *Functional-Grammar Knowledge Base* or FunGramKB. FunGramKB has been described by Periñán & Arcas (2005: 239) as “a user-friendly online environment for the semiautomatic construction of a multipurpose lexico-conceptual knowledge base for a natural language processing (NLP) systems”. This AI project is multipurpose since it is both multifunctional and multilingual. On the one hand, FunGramKB can be employed in several NLP tasks, such as information retrieval and extraction,²³ machine translation, dialogue-based systems, text categorization, data mining, etc. On the other hand, it provides information from many natural languages. English and Spanish are fully supported in the current version of this knowledge base, whereas information from German, French, Italian, Bulgarian and Catalan is in the process of being included.²⁴ FunGramKB consists of two general information levels, which in turn comprise several independent but interrelated modules:

- (i) The linguistic level is made up of a lexical and a grammatical level. The lexical realm captures specific properties of the languages of the world. It encompasses the Lexicon and the Morphicon. The first contains morphosyntactic, pragmatic and collocational information about a given lexical unit. Mairal &

²³ Periñán & Arcas (2006) list the advantages of using this knowledge base as an information extraction tool over other monolingual electronic dictionaries: the adaptability of the lexicographical data to users' profiles, the completeness and accuracy of grammatical information, and the provision of an intelligent search engine which can retrieve information in the shortest period of time possible.

²⁴ Periñán & Arcas (2007a) argue that although FunGramKB follows Dik's Functional Grammar (1997), it differs from this model of semantic representation in two important aspects: (i) Dik's model was devised for a single NLP task, i.e. machine translation, whereas FunGramKB can be used in various NLP tasks, including machine translation; (ii) Contrary to Dik (1997), who proposes the use of words for the formal description of meaning postulates, FunGramKB describes words using universal concepts, thus, avoiding the problem of language dependency and lexical ambiguity caused by the polysemic nature of lexical units.

Periñán (2009b: 220) claim that the lexical component is not a literal implementation of the lexical information in RRG. Despite maintaining the fundamental assumptions postulated by RRG, i.e. logical structures, macroroles, and the linking algorithm, FunGramKB is a more robust knowledge base. The Morphicon deals with cases of inflectional morphology. According to Mairal, Ruiz de Mendoza & Periñán (2012) the grammatical level or Grammaticon draws on the four levels of meaning construction of the LCM in the sense that it has the same number of Constructicon modules, viz. the argument-structure layer (L1-Constructicon), the implicational layer (L2-Constructicon), the illocutionary layer (L3-Constructicon), and the discourse-structure layer (L4-Constructicon).

(i) The conceptual level is language-independent because it is concerned with non-linguistic knowledge. This realm joins three different knowledge schemata: the Ontology, the Cognicon and the Onomasticon. Unlike the Lexicon which handles language-specific words, the Ontology is conceived as a hierarchical catalogue of concepts. Conceptual units are structured mental representations (cf. Periñán & Mairal 2010) endowed with universality because they can be employed to define any word in any language. In the Ontology, semantic knowledge is rendered in the form of meaning postulates. The Cognicon makes reference to procedural knowledge by means of script-like constructs which organize a sequence of stereotypical actions on the basis of temporal continuity (Allen 1983; Allen & Ferguson 1994). How to fry an egg or how to buy a product are instantiations of such conceptual proto-macrostructures (see Garrido & Ruiz de Mendoza 2011 for an implementation proposal). Also, as remarked by Mairal, Ruiz de Mendoza & Periñán (2012), these script-like schemata are similar to low-level situational cognitive models captured at level 2 of the LCM. Lastly, the

Onomasticon gathers information about instances of entities and events like the Beatles, Taj Mahal, or 9/11. There are two different types of schemata within this module, namely snapshots and stories. The former portray entities and events synchronically whereas the latter describe them diachronically.²⁵

Figure 2.3 offers a panoramic view of the architecture of this knowledge base and the way the six modules interact:

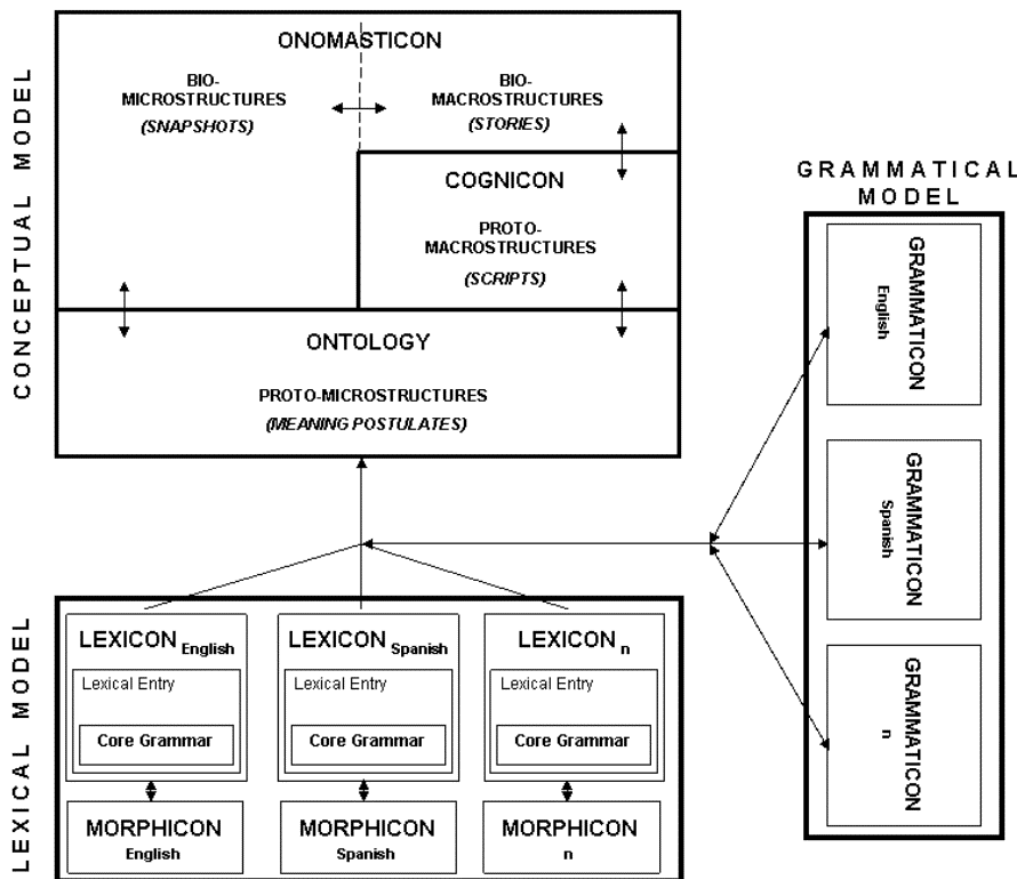


Figure 2.3 The FunGramKB architecture (Mairal, Ruiz de Mendoza & Periñán 2012)

²⁵ This threefold classification of knowledge schemata (meaning postulates in the Ontology, cognitive macrostructures in the Cognicon and the cases in the Onomasticon) is borrowed from the domain of cognitive psychology (cf. Tulving's 1985 long-term memory model), in which common-sense knowledge is divided into: (i) semantic knowledge about words, which is mapped onto meaning postulates; (ii) procedural knowledge, which corresponds to cognitive macrostructure, and (iii) episodic knowledge, which is represented in the form of snapshots or stories.

As pictured in this figure, there is a clear-cut division between the linguistic level (the Lexicon, the Morphicon, and the Grammaticon) and the conceptual level (the Ontology, the Cognicon, and the Onomasticon). This figure also reflects the typology of conceptual schemata according to the parameters of prototypicality and temporality. The conceptual representations that store prototypical knowledge are called proto-structures, while those that describe instances of entities or events are labeled bio-structures. Thus, if we want to describe the meaning of the word *building* we have to construct a proto-structure. By contrast, if we want to depict a particular building, e.g. the Guggenheim Museum, then we have to use bio-structures. Also, knowledge can be presented atemporally (i.e. microstructures, e.g. the description of the profession of an architect) or within a temporal framework (i.e. macrostructures, e.g. the biography of Frank Gehry).

Our main focus of attention will be on the following three modules: the Lexicon, the Ontology, and the Grammaticon. Before examining these levels in detail several observations should be made. First, as noted earlier, the lexical and the grammatical modules contain language-specific information whilst the conceptual module is shared by all the languages included in FunGramKB. There are two main consequences deriving from this. On the one hand, computational lexicographers will create one Lexicon, one Morphicon, and one Grammaticon for English, one Lexicon, one Morphicon, and one Grammaticon for Spanish, and so on. On the other hand, knowledge engineers will develop one Ontology, one Cognicon and one Onomasticon that are sufficient to process any linguistic input conceptually. Second, this distinction between the linguistic and the non-linguistic levels leads to the use of two different interlinguas, i.e. the *conceptual logical structures* (CLS henceforth), and the *Conceptual Representation Language* (hereafter, COREL). The relationship between CLSs and

COREL is illustrated in the figure below extracted from Mairal, Ruiz de Mendoza & Perrián (2012: 94):

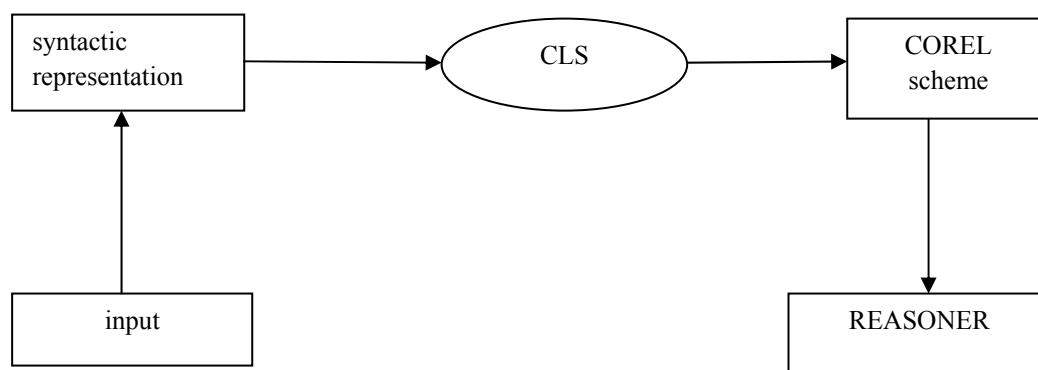


Figure 2.4 Linking syntactic and conceptual representations in FunGramKB

CLSs are lexically-oriented schemata which reflect the interaction between the Lexicon and the Grammaticon, whereas the COREL scheme constitutes the input for the reasoning engine.

Finally, the Ontology is the pivot around which the different lexica revolve, since this knowledge base is conceptually-driven. The Lexicon is populated in a top-down fashion, i.e. the description of a lexical entry must be preceded by the creation of its corresponding concept in the Ontology. For example, a computational lexicographer can fill in the morphosyntactic information related to lexical units such as *transfer* (Eng.) and *transferir* (Sp.) only if a knowledge engineer has previously created in the Ontology the concept +TRANSFER_00 together with its thematic frame and meaning postulate.²⁶

²⁶ For an exhaustive definition of the thematic frame and meaning postulate of a concept, the reader is referred to section 10.2.

2.10.1. The FunGramKB Lexicon

Originally the FunGramKB lexical level followed OLIF (Open Lexicon Interchange Format) recommendations which provided an XML format for lexical/terminological data encoding (Lieske *et al.* 2001; McCormick 2002; McCormick *et al.* 2004). The OLIF model was designed in order for users to share lexical resources within the translation domain (e.g. machine translation, terminology databases, translation memories, etc.). Later on, the FunGramKB Lexicon incorporated EAGLES (The Expert Advisory Group on Language Engineering Standards)/ISLE (International Standards for Language Engineering) specifications for more robust computational lexica (Monachini *et al.* 2003; Underwood & Navarretta 1997; Calzolari *et al.* 2001ab, 2003).

Lexical entries are stored in the form of feature-value data structures using an XML formal language. The features in FunGramKB lexical entries can be grouped into four main categories: (i) properties that convey basic information; (ii) morphosyntactic features; (iii) LCM Core Grammar features; and (iv) miscellaneous properties. The first category includes essential information, e.g. the headword, the index and the language. The headword is the canonical orthographic representation of a given lexical item, whereas the index is a numerical string which has the purpose of arranging the meanings of that lexical unit. The role of the language feature is transparent in the sense that it indicates the language to which a lexical item belongs. The FunGramKB Lexicon comprises twelve morphosyntactic features for verbs, adjectives, adverbs, and nouns. Since this dissertation centers on verbs only, seven of them concern us here:

- (i) The graphical variant. For example, the entity-specific change-of-state verb *molt* is the American spelling of *moult*, which is the British English form of the verb.
- (ii) The abbreviation. The auxiliary verb can be abbreviated when it combines with pronouns, e.g. *he'll* for *he will*.
- (iii) The phrase constituents. Headwords can be either simple or complex. In the case of complex words, it is necessary to specify which word within the phrase is the head. Thus, the verb *pull* constitutes the head of the idiom *pull one's leg*.
- (iv) The particles. The change of possession verb *give up* is a phrasal verb with a detachable particle which allows syntactic objects to be embedded.
- (v) The category. It gives information about the class of lexical units, in our case verbs.
- (vi) The verb paradigm and constraints.²⁷ These features refer to the inflectional paradigm of a verb which can be regular (e.g. *contribute-contributed*), irregular (e.g. *get-got-got*), or both regular and irregular (e.g. *burn-burned/burnt*).
- (vii) The pronominalization. This feature refers to clitic variations of a lexical unit, i.e. reflexivity and reciprocity. Thus, a verb can be grammatically clitised (e.g. *look*), optionally clitised (e.g. *believe*) or never clitised (e.g. *say*). Also, a verb can be grammatically reciprocal (e.g. *separate*) or never reciprocal (e.g. *live*).

As noted by Mairal & Periñán (2009a), the values of the attributes included in the LCM Core Grammar are of crucial importance, since they enable the system to build

²⁷ Periñán & Arcas (2006) point out that FunGramKB also covers constraints on voice and tense (e.g. the Spanish verb *soler* cannot be conjugated in the future and conditional tenses).

automatically the CLSs of headwords. These features specify the *Aktionsart* of a verb and additional information related to the lexical template (e.g. the number of variables, idiosyncratic features such as the macrorole and the undergoer) and to the constructions into which a given lexical unit can be subsumed. All these properties will be discussed at length in section 5.1.2.

Lastly, the miscellaneous features involve information about the dialect of a lexical unit (e.g. British, American, standard), the domain in which a headword is used (e.g. commerce, industry, law, etc.), corpus examples illustrating the meanings of a verb (e.g. *British National Corpus* for English and *Corpus de Referencia del Español Actual* for Spanish), and the default translation equivalents in other languages, such as French or Italian.

2.10.2. The FunGramKB Ontology

The Ontology of this AI project differentiates between three conceptual levels with different degrees of genericity/specificity: metaconcepts, basic concepts, and terminal concepts. Metaconcepts represent the upper level and the most abstract conceptual level. They are preceded by the symbol # (e.g. #ABSTRACT, #MOTION, #POSSESSION, #COLLECTION, #TEMPORAL, #COMMUNICATION, etc.) and they are based on other linguistic Ontologies (e.g. DOLCE, SIMPLE, SUMO, Generalized Upper Model, etc.). FunGramKB has forty-two metaconcepts which are divided into three subontologies, since subsumption (IS-A) is the only relation allowed between them: #ENTITY for nouns, #EVENT for verbs, and #QUALITY for adjectives and some adverbs.

In their turn, basic concepts, which are headed by the symbol + (e.g. +FAR_00, +MOVE_00, +HUMAN_00, +DIRTY_00, +HAND_00, +FORGET_00, etc.), are defining units which allow knowledge engineers to create meaning postulates for both basic²⁸ and terminal concepts. The latter are preceded by the symbol \$ and they lack defining potential so they cannot participate in meaning postulates (e.g. \$EXCHANGE_00, \$CONGRATULATE_00, \$HUM_00, \$BROOD_00, \$INHERE_00, \$SWEAR_00, etc.).

Basic and terminal concepts are not atomic symbols but they are characterized by semantic properties, i.e. the thematic frame (TF) and the meaning postulate (MP),²⁹ which serve as building blocks for the formal description of meaning. It is also worth pointing out that both conceptual schemata are language-independent semantic knowledge representations. In the Ontology events (i.e. verbs) are provided with one thematic frame, which is conceived as “a conceptual construct which states the number and types of participants involved in the prototypical cognitive situation portrayed by the concept” (cf. Perriñán & Mairal 2009: 267). For the sake of illustration, consider the thematic frame of the basic concept +PAY_00, to which lexical units like *pay* (Eng.), *pagar* (Sp.), or *payer* (Fr.) are connected:

(20) (x1: +HUMAN_00)Agent (x2: +MONEY_00)Theme (x3)Origin (x4:
+HUMAN_00)Goal

²⁸ Basic concepts were identified by means of the Longman Defining Vocabulary (Procter 1978) and the *Diccionario para la Enseñanza de la Lengua Española* (Alvar Ezquerro 1995). Perriñán & Mairal (2011) point out that the cognitive mapping of the basic concepts was guided by a four-phase COHERENT methodology, i.e. conceptualization, hierarchization, remodeling, and refinement phases.

²⁹ Perriñán & Mairal (2010) state that an MP can be characterized by two types of properties: nuclear and exemplar. The former perform a categorial function in the sense that they determine class membership (e.g. *grandmother* can be defined as *mother of a parent*). The nuclear features can only be represented by means of strict predications preceded by the operator + and they can never be refuted. The exemplar features serve an identification purpose (e.g. *grey hair* and *wrinkles* describe the typical members of the category *grandmother*). They can be represented by defeasible predications headed by the operator * and they can accept exceptions. Also, FunGramKB does not include subjective features resulting from sociocultural conventions (e.g. *foxes are clever*).

Therefore, this basic concept takes four participant roles:³⁰ (i) an Agent who makes another entity move (x1); (ii) a Theme that changes its place or position (x2); (iii) an Origin, which is the location from which the Theme moves (x3), and (iv) a Goal, which is the location to which the Theme moves (x4). The participant roles can be further specified through the addition of selectional preferences which can exert some predictive power on the thematic roles, e.g. +HUMAN_00, +MONEY_00. These selectional preferences show that the Agent and the Goal are necessarily human beings whereas the Theme (i.e. what is transferred) is always money.³¹

At this point it is important to mention that in the Ontology concepts are linked by means of two major reasoning mechanisms: inheritance and inference (cf. Perriñán & Arcas 2005; Perriñán & Mairal 2010). By means of inheritance, the basic concept +PAY_00 (see (21) below) receives the information found in its immediate superordinate basic concept (i.e. +GIVE_00), which in its turn inherits the thematic roles spelled out by its superordinate metaconcept (i.e. #MOTION). Regarding inference, this has been defined by Perriñán & Arcas (2005: 241) as a reasoning mechanism “based on the structures shared between predications linked to conceptual units which do not take part in the same subsumption relation within the Ontology”.

³⁰ Perriñán & Mairal (2010: 19-20) claim that in FunGramKB thematic roles are not linked to any particular metaconcept since the cognitive dimension itself enriches the meaning of a thematic role. Take into consideration the thematic role Theme, which appears in all cognitive dimensions. This participant role acquires a different semantic interpretation depending on the metaconcept in which it is used, e.g. in #COGNITION the Theme is the entity that undergoes a cognitive process, whereas in #COMMUNICATION the Theme becomes the entity that transmits a message. This reduced inventory of thematic roles avoids excessive proliferation of semantic functions and preserves conceptual informativeness. For a more detailed presentation of metaconcepts and their corresponding thematic roles see Appendix I.

³¹ We should also mention the existence of subconcepts, which arise when some sort of conceptual specification takes place exclusively inside the TF of a basic or a terminal concept, without varying the MPs. Subconcepts are recorded in capital letters and preceded by a minus symbol, e.g. -PREEN (Jiménez, Luzondo & Pérez 2011: 22). This subconcept is linked to the basic concept +CLEAN_00, sharing its MP but differing from it in the selectional preferences of the participants in the TF, namely (x1: BIRD_00)Theme (x2: +FEATHER_00)Referent. The reader is referred to Jiménez & Luzondo (2011), Jiménez & Pérez (2011) and Jiménez, Luzondo & Pérez (2011) for a detailed account.

Meaning postulates have been best described by Periñán & Mairal (2009: 267) as “a set of one or more logically connected predications ($e_1, e_2 \dots e_n$), i.e. conceptual constructs carrying the generic features of concepts”. Coming back to the basic concept +PAY_00, we shall exemplify its meaning postulate:

(21) +(e1: +GIVE_00 (x1)Agent (x2)Theme (x3)Origin (x4)Goal (f1: (e2: +SELL_00 (x4)Agent (x5)Theme (x4)Origin (x1)Goal))Reason)³²

This representation can be interpreted in the following way: an Agent (x1) makes an entity (x2; Theme) move from an Origin (x3) to a Goal (x4), provided that the Goal has previously sold another entity (x5; Theme) to the Agent.

Periñán & Arcas (2004: 39) discuss Velardi *et al.*'s (1991) two main strategies for the description of meaning in computational lexicography: (i) a relational approach based on surface semantics which describes the meaning of a word through associations with other lexical units in the lexicon (e.g. SIMPLE or EuroWordNet databases), and (ii) a conceptual approach based on deep semantics which describes a word by means of semantic features or primitives (e.g. FunGramKB). Compare the relational representation of *bird* in EuroWordNet with the conceptual one proposed by FunGramKB:

EuroWordNet: HAS_MERO_PART (bird, feather)/HAS_MERO_PART (bird, leg)/HAS_MERO_PART (bird, wing)

FunGramKB: *(e2: COMPRISE (x1: BIRD)Theme (x3: m FEATHER & 2 LEG & 2 WING)Referent).

³² Reason is a satellite predication that describes the cause of an event. For an exhaustive list of the meaning of satellites see Appendix II.

First, we notice that EuroWordNet provides no information about the number of the body components, while FunGramKB uses absolute quantification operators to indicate that a bird has two legs and two wings and the relative quantification operator *m* to illustrate that a bird has many feathers. Evidently, the conceptual approach has greater expressive power than the relational one.

Second, the conceptual representation is more economical, since it expresses the meronymic relationship between the bird and its parts in a single predication. The advantages of the conceptual approach adopted by FunGramKB can be summarized as follows (see also Perriñán & Arcas 2007b: 283-235): (i) meaning components can be easily placed within the dimensions of quantification, aspectuality, temporality or modality;³³ (ii) complex cognitive meaning postulates lend themselves easily to co-reference between internal conceptual units while this is not the case with the relational approach which lacks inference and inheritance mechanisms; (iii) the conceptual approach minimizes redundancy³⁴ and maximizes informativeness; (iv) FunGramKB provides a more accurate and realistic account of the world since it allows non-monotonic reasoning expressed by means of defeasible predications preceded by the operator *. Non-monotonicity permits the withdrawal of statements which hold only for the typical members of a given class. Thus, a bird with one wing is still a bird although not a typical one.

³³ See Appendix III for a detailed account of the predication and participant operators.

³⁴ Perriñán & Mairal (2011: 21-25) exemplify how FunGramKB lexicographers contribute to the minimization of redundancy. When there are three lexical units that express the same state of affairs (e.g. *obedience-obedient-obey*) the verb is selected. Also, FunGramKB defines a negative focal concept by negating the positive one, e.g. *dead* means *not alive*. Thus, it avoids storing another lexical unit. FunGramKB makes recourse to cognitive clustering for words that describe the same cognitive scenario (e.g. *buy-sell*, where *buy* is bound to the basic concept +SELL_00) or for synonyms or quasi-synonyms (e.g. *answer-reply*, *beautiful-nice-pretty*).

2.10.3. The FunGramKB Grammaticon

As mentioned previously in section 2.10, the Grammaticon is a grammatical module which stores the constructional schemata of the LCM in the form of four different types of construction: L1-Constructicon, listing argument structure constructions, L2-Constructicon, concerned with implicational constructions, L3-Constructicon, which deals with illocutionary constructions, and L4-Constructicon, displaying discourse structure constructions. In this dissertation we concentrate only on the argument structure constructions found in the L1-Constructicon. Figure 2.5 below shows how the reasoning engine is able to establish a link between the three domains, namely the Lexicon, the Ontology and the Grammaticon via the CLS Constructor.

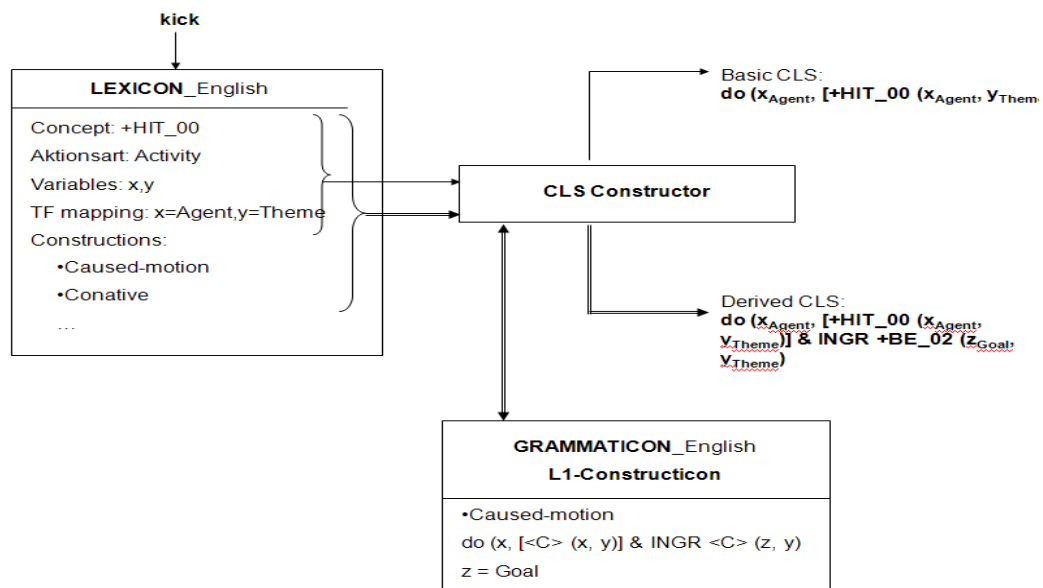


Figure 2.5 The lexical-grammatical-conceptual linkage (extracted from Mairal, Ruiz de Mendoza & Perrián 2012)

In the words of Mairal & Ruiz de Mendoza & Perrián (2012) the CLS Constructor is “an algorithmic tool that takes conceptual and lexical information as input and delivers the basic CLS of a predicate as output”. In the Figure above we can observe how the CLS Constructor retrieves information about a given lexical unit (in

this case the verb *kick*) from the Lexicon and the Ontology, and generates a basic CLS, viz. $\text{do} (x_{\text{Agent}} [+HIT_00 (x_{\text{Agent}}, y_{\text{Theme}})])$. On a second stage the CLS Constructor combines this basic CLS with the information spelled out in the L1-Constructicon about the caused-motion construction in order to deliver a derived CLS as output, i.e. $\text{do} (x_{\text{Agent}} [+HIT_00 (x_{\text{Agent}}, y_{\text{Theme}})]) \& \text{INGR } +\text{BE_02} (z_{\text{Goal}}, y_{\text{Theme}})$.

Mairal, Perrián & Pérez (2011) propose the replacement of RRG logical structures with CLSs³⁵ since the use of logical structures raises several problems. Some lexical representations decompose their semantic primitives whereas others employ the same *definiendum* as *definiens*. For example, *sing* is defined as **do'** (x, [**sing'** (x)]) while *learn* can be broken down into BECOME **know'** (x, y). By contrast, meaning postulates in FunGramKB offer more refined semantic representations. The MP of *sing* demonstrates that its meaning can be further decomposed, i.e. $+(e1: +\text{SAY_00} (x1)\text{Theme} (x2)\text{Referent} (x3)\text{Goal} (f1: +\text{MUSIC_00})\text{Manner}$. Thus, a Theme utters something (x2) in a musical manner (f1). Moreover, logical structures express only those aspects that have a syntactic impact, thus disregarding semantic and pragmatic factors in the definition of a predicate which can become grammatically relevant. Nonetheless, we wonder how the RRG logical structure of *sing* can account for sentences such as *He sang a lullaby* or *He sang to me*, given the fact that this semantic representation displays a single participant, viz. the singer. However, in the FunGramKB representation $+\text{SING_00}$ inherits from $+\text{SAY_00}$ the Referent and the Goal which correspond to the direct and indirect object at the syntactic level.

An ontological approach for the lexical representational system is preferred for various reasons: (i) CLSs are not formed by language-dependent words but by concepts, which grant them a universal status; (ii) the ontological arrangement of FunGramKB

³⁵ The inventory of CLSs is displayed in Appendix IV.

automatically determines what conceptual unit becomes part of a given representation;
and (iii) inheritance mechanisms permit CLSs to be enriched with cultural and
encyclopedic knowledge stored in the knowledge base.

Chapter 3

Research methodology

3. 1. Introduction

The exact status of corpus linguistics as well as its origins still remain unclear (Leech 1991). As to its status, linguists have yet to reach a consensus about whether it is a theory or a methodology. Most linguists regard it as a methodology for language analysis (see Kennedy 1998; Meyer 2002). McEnery & Wilson (2001: 2) describe corpus linguistics as a methodology rather than a discipline in its own right:

Corpus linguistics is not a branch of linguistics in the same sense as syntax, semantics, sociolinguistics and so on. All of these disciplines concentrate on describing/explaining some aspect of language use. Corpus linguistics in contrast is a methodology rather than an aspect of language requiring explanation or description [...] Syntax, semantics and pragmatics are just three examples of areas of linguistic enquiry that have used a corpus-based approach [...] Corpus linguistics is a methodology that may be used in almost any area of linguistics, but it does not truly delimit an area of linguistics itself.

However, for Teubert & Krishnamurthy (2007: 2) corpus linguistics is “much more than an assortment of some computational tools plus some small and large corpora”. Even if Tognini-Bonelli (2001: 1) embraces the view of corpus linguistics as a methodology, she acknowledges that corpus linguistics is “a new research enterprise and a new philosophical approach to linguistic enquiry” with a theoretical status.

The development of corpus linguistics can be divided into two main periods: (i) ‘early corpus linguistics’³⁶ (before the 1950s), which used a methodology based on

³⁶ This term was coined by McEnery & Wilson (2001: 2) to refer to the domain of linguistics before the advent of Chomsky. However, field linguists and structuralists did not employ this term for their work.

observed language use (e.g. language acquisition, spelling conventions, language pedagogy, comparative linguistics, historical linguistics³⁷), and (ii) late generation corpus linguistics (late 1950s and early 1960s) that boomed with the creation of several computerized and non-computerized corpora, e.g. The Survey Corpus, the Brown Corpus, the London-Lund Corpus. Chomsky's (1962: 159) denigratory observations about corpus-based approaches played a crucial role in the marginalization of corpus linguistics in the 1960s:

Any natural corpus will be skewed. Some sentences won't occur because they are obvious, others because they are false, still others because they are impolite. The corpus, if natural, will be so wildly skewed that the description would be no more than a mere list.

Since corpora are finite collections of texts, they cannot provide an adequate representation of human language, which is infinite. To support his view, Chomsky gives the example *I live in New York*, which is more likely to appear in a corpus than the sentence *I live in Dayton Ohio* simply because New York has a bigger population than Dayton Ohio. McEnery & Wilson (2001: 15) claim that even the absence of an example from a corpus can tell us important facts about its frequency. It is our contention that generative grammar runs into the same problem of partiality, since a theoretical linguist cannot discuss all the sentences of a natural language.

Other arguments against the use of corpora are best summarized by Leech (1992: 107), who discusses the points of divergence between generative grammar and corpus linguistics:

³⁷ Tognini-Bonelli (2001: 51) goes as far as to state that "modern linguistics owes its impetus to the lively work of the historical linguists of the nineteenth century". While it may be true that historical linguistics relies heavily on the use of corpora (which are understood as collections of texts from different periods and locations) to substantiate its claims about language change and evolution (see also Johansson 1995: 22), there are other disciplines that have a strong corpus-based grounding: language acquisition, pedagogy, comparative linguistics, etc.

(i) Corpus linguistics favors the enumeration and description of linguistic performance, whereas the generative paradigm focuses on introspection and explanation of linguistic competence.³⁸ Given the fact that performance can be regarded as the product of linguistic competence, the difference between these two notions is not so neat (cf. Leech 1992: 108). At the same time, the corpus serves as basis for the validation of the completeness, simplicity, strength, and objectivity of a theoretical hypothesis (Leech 1992: 112-13).

(ii) Corpus linguistics can approach the data from a quantitative as well as from a qualitative perspective. The corpus is a reliable source of data characterized by frequency, systematicity and objectivity. Unlike generative grammar, which holds a rationalist view of scientific enquiry, corpus linguistics supports an empiricist approach to language.

However, corpus linguistics and theoretical linguistics are not incompatible approaches and we should work towards fusing them into what Gilquin (2010: 11) has termed ‘computer-aided armchair linguistics’. In fact, Fillmore (1992: 35) was among the first linguists who pioneered this idea by arguing that “the two kinds of linguists need each other. Or better, that the two kinds of linguists, wherever possible, should exist in the same body”. The LCM strives to combine both, since it makes use of naturally occurring data extracted from corpora as well as a solid theoretical framework against which the collected data can be described, analyzed and explained. Although an

³⁸ Chomsky distinguishes three levels of adequacy for the evaluation of grammatical descriptions and linguistic theories: observational adequacy, descriptive adequacy, and explanatory adequacy. The first deals with the well-formedness of sentences in a given language (e.g. *He went to the store* is grammatically correct whilst **went to the store* is not). The second level of adequacy specifies the abstract grammatical requirements for well-formedness (e.g. **went to the store* is unacceptable because the subject of a sentence in English must be expressed obligatorily). The third, and the highest level of adequacy, is concerned with the formulation of abstract universal principles that can account for phenomena occurring in more than one language. At this level, English can be contrasted with other ‘pro-drop’ languages, such as Spanish and Japanese, which allow the omission of the subject pronouns because these can be recovered from the context or inferred from the verb inflections marking the case, gender and number of the subject.

introspective analysis³⁹ has limitations, it should not be shunned entirely. In this respect, Gibbs (2006: 148-149) provides cognitive linguists with a set of steps that can enhance introspection:

- (i) Linguistic analyses are not necessarily isomorphic with individual mental representations. Construction grammarians assume that grammar is organized as a vast network of interrelated lexical and syntactic constructions. Nevertheless, this complex representation may not have a counterpart in people's minds.
- (ii) A linguist should formulate falsifiable hypotheses, i.e. those that can be tested empirically and invalidated.
- (iii) A linguistic analysis should favor a given hypothesis but at the same time it should mention the alternative hypotheses that have been discarded and the reasons for doing so. When discussing the cognitive motivations behind non-emotional causality, the LCM specifies alternative proposals, viz. Dirven's (1993, 1995) metaphorical approach and Cuyckens's (2002) metonymical treatment. The LCM opts for a more encompassing approach, namely the postulation of a conflational continuum in cognitive processing (see section 4.1.1).
- (iv) A cognitive linguist should not presuppose that complex meanings always require intricate mental processes for the production and understanding of those meanings. For example, Ruiz de Mendoza's (2008) double-source metaphoric amalgams (e.g. *The girl blossomed into a beautiful woman*), which involve two metaphoric sources being mapped onto a single target domain, may not actually

³⁹ Myers (2002: 128, cited in Gibbs 2006: 140) illustrates the limitations of intuitive scientific reasoning: the formation of false memories, hindsight bias, self-serving bias, overconfidence, belief preservation and confirmation bias, framing, illusory correlation, etc. Also, Deignan (2005: 85-87) suggests that the limitations of human memory can be compensated by the use of corpora that store large amounts of text. At the same time it has been demonstrated that people are not good at describing their own language production (cf. Sinclair 1991) and are incapable of accessing language knowledge out of context. Lastly, corpus data can provide us with information that we might not be aware of since it is impossible for a linguist to know all the words of their language and their meanings in use.

require any additional processing effort on the part of a speaker.⁴⁰ In any event, this is an empirical issue for psycholinguistic research.

(v) The use of a given linguistic pattern can have multiple motivations. When English speakers use the phrasal verb *shell out* in the caused-motion construction, they certainly do not think that their choice is motivated by a combination between a metaphor and a metonymy (see section 4.3.2). People simply use a linguistic form because of historical convention, cultural norms or social context (see also Panther & Radden's 2011 reflections on linguistic motivation).

Despite relying heavily on large, computerized corpora, this research combines both inductive and deductive analyses, since data-driven analysis should not run counter to the linguist's intuition and competence. Moreover, just as Mukherjee (2005: 70) underlines, the corpus may help the linguist to test, "to refine, modify or even replace the initial working hypotheses". Corpus analysis furnishes us with performance-related results that can boost or reject the validity of cognitive models of language.

Lastly, many linguists have suggested that a combination between corpus linguistics and cognitive linguistics would greatly benefit both frameworks. Gilquin (2010: 16-17) examines the advantages offered by a model integrating cognitive linguistics and corpus linguistics: (i) cognitive linguistics brings more theoretical sophistication, develops the explanatory power and psychological plausibility of corpus linguistics by incorporating crucial aspects relevant to the interpretation of data (e.g. the semantic or pragmatic motivation of linguistic observations, etc.)⁴¹; (ii) by using corpus

⁴⁰ For a detailed analysis of metaphoric amalgams see section 4.2.2.

⁴¹ Bybee (2006) provides a strong case for the inclusion of corpus-based frequency of use into cognitive models. She shows that formal aspects used by corpus linguistics, such as frequency and co-occurrence have an effect on cognitive representations and language structure (see also Deignan 2005).

linguistics as a methodology, cognitive linguistics confirms its status as a usage-based approach⁴² and bolsters its descriptive adequacy and linguistic plausibility.

In this connection, the present dissertation strives to complement cognitive assumptions with information drawn from several corpora but, for reasons that will be made apparent below (see section 3.3 below), it does not resemble the quantitative and statistical analyses proposed by Stefanowitsch & Gries (2003), Gries & Stefanowitsch (2006), Gries & Wulff (2009), Peirsman, Geeraerts & Speelman (2010), Turney & Pantel (2010), to name just a few.

This chapter is structured as follows. Section 3.2 introduces the reader to the notion of *corpus* and supplies an accurate description of the corpus that has been compiled for the present study. Section 3.3 examines in detail the empirical methodology and focuses on the major steps that have been taken in order to carry out this work.

3. 2. Definition of a corpus

Since this work uses the corpus as a tool to derive linguistic generalizations, it is necessary to clarify what is understood by this term. The term “corpus” has received many definitions, which range from very general to more specific ones:

[A corpus] can potentially contain any text type, including not only prose, newspapers, as well as poetry, drama, etc., but also word lists, dictionaries, etc. (EAGLES, quoted in Meyer 2002: xi)

[A corpus is a] subset of an ETL (Electronic Text Library) built according to explicit design criteria for a specific purpose (Atkins *et al.* 1992: 1, cited in Tognini-Bonelli 2001: 53)

⁴² In an attempt to go beyond an introspective stage, cognitive linguistics committed itself to “the actual use of the linguistic system and a speaker’s knowledge of this use” (cf. Langacker 1987: 494), by making recourse to naturally-occurring corpus data.

In the language sciences a corpus is a body of written text or transcribed speech which can serve as a basis for linguistic analysis and description (Kennedy 1998: 1)

A corpus is a collection of texts assumed to be representative of a given language, dialect, or other subset of a language to be used for linguistic analysis (Francis 1992: 17, quoted in Tognini-Bonelli 2001: 53)

A corpus is simply any collection of written or spoken texts. However, when the term is employed with reference to modern linguistics, it tends to bear a number of connotations, among them machine-readable form, sampling and representativeness, finite size, and the idea that a corpus constitutes a standard reference for the language variety it represents (Lüdeling & Kytö 2008: v, cited in Luzondo 2011: 19)

The first definition uses a rather narrow typological criterion since it excludes spoken forms of text. No mention is made of the function of this body of texts or their length. Also, we do not know whether this definition refers to computerized or non-computerized samples of text. Atkins *et al.*'s (1992: 1) definition is very broad with respect to the purpose of a corpus. According to Francis (1992: 17), a collection of texts does not necessarily serve a linguistic purpose (e.g. an anthology fulfills a literary function). The most encompassing definition of a corpus is the one put forward by Lüdeling & Kytö (2008: v) since it comprises the following criteria: (i) machine-readable form as opposed to printed text⁴³; (ii) sampling and representativeness (a selection of a whole variety of language is more indicated than examining texts belonging to an author or a single register/genre); (iii) finite size (e.g. the British National Corpus comprises a finite number of words) as opposed to ever-changing size (e.g. John Sinclair's COBUILD is a monitor corpus which constantly increases in size); and (iv) standard reference (i.e. a widely used corpus stands as reference point for the comparison of successive studies).

⁴³ McEnergy & Wilson (2001: 31) enumerate the advantages of machine-readable corpora, such as the ability to perform a quick manipulation and search and the possibility of enrichment with additional information.

At this point it is important to clarify that our corpus includes both computerized and non-computerized data. The non-computerized sources that we have employed are dictionaries and thesauri (e.g. *The Longman Dictionary of Contemporary English*, *Collins Cobuild*, among others) and existing literature on the matter. The computerized data have been mainly extracted from The British National Corpus (BNC), The Corpus of Contemporary American English (COCA) and The Sketch Engine. In addition, we have constructed some of our own examples for the sake of theoretical debate. Nevertheless, the validity of such examples was tested against further corpora searches of similar or closely related utterances. Regarding the criteria for corpus selection, our research is based on variety, open-endedness and reliability. The fact that the examples constitute samples of everyday language and cover different fields and registers has ensured their reliability.

3.2.1. Description of the corpus

This dissertation was originally intended to be carried out on data obtained exclusively from the British National Corpus (BNC henceforth) and the Corpus of Contemporary American English (COCA hereafter), but these corpora returned an extremely low number of hits to our queries. The BNC is an electronic corpus comprising approximately 100 million words from roughly 4,000 modern English texts. Broadly, 90% of the corpus is constituted by written texts and 10% is represented by the spoken part.⁴⁴ The written texts range from non-fictional genres (informative prose from

⁴⁴ Meyer (2002: 30) underlines that the amount of spoken data in the BNC is the largest collection of spoken English made available in a corpus and it even surpasses the London-Lund Corpus (LLC), which was designed exclusively to cover spoken texts. Nonetheless, Leech (1993, cited in Kennedy 1998: 50), argues that the BNC does not solve the severe imbalance between spoken and written data, which is a major inconvenience of most corpora.

1975 to the early 1990s such as newspapers or journals) and fictional writing (imaginative from 1960 to the early 1990s like letters or essays among others). The spoken texts cover transcriptions of conversation and speech collected in different contexts, from informal conversations to government meetings. The encoding system used in the BNC conforms to the TEI (Text Encoding Initiative) employing ISO standards to represent the structural properties of texts. This powerful tool, which has the advantage of reproducing current and actual linguistic expressions of British English, has been designed, developed and annotated by collaborators from Oxford University Press, the Universities of Lancaster and Oxford, Longman Group, and the British Library. The BNC is a multi-purpose corpus (i.e. it can be used to document studies of vocabulary, grammatical analysis, to establish comparisons between different genres and national varieties of the English language, etc.) and a general-purpose corpus⁴⁵ (i.e. it does not contain a full representation of a given genre).

In its turn, the COCA is a bigger electronic corpus, which contains over 400 million words. The texts range from spoken, fiction, magazines, and newspapers to academic texts. The fact that this corpus is updated once or twice a year makes it a suitable tool for examining the current changes in the English language. The COCA allows us to carry out a more complex search than the BNC, since we can search by words, phrases, collocates, synonyms, lemmas or wildcards.

However, the lack of data from the BNC and the COCA determined us to turn to a bigger and richer corpus, namely the Sketch engine, which incorporates the BNC. Unlike the BNC and the COCA, which are instances of monolingual corpora, the Sketch engine provides access to large corpora (ranging from 30 million to 10 billion words)

⁴⁵ From this perspective the BNC can be contrasted with special-purpose corpora designed to perform a more specialized function (e.g. CHILDES was intended to cover the language of children and adolescents).

for 42 languages. This tool takes as input a corpus of any language with its grammar patterns and generates word sketches for the words in that language (i.e. one-page automatic characterizations of the grammatical and collocational behavior of that word).⁴⁶ Occasionally we have explored the World Wide Web through Google searches, very much in line with the methodological approach postulated by Renouf (2003) and Kilgarriff & Grefenstette (2003), who all argue in favor of Google as a useful resource for the retrieval of linguistic information and for all kinds of language research.

3.3. Methodological considerations

Throughout our dissertation, we have mainly used a hypothetical-deductive approach in the hope of offering a panoramic view of the topic under scrutiny. This method can be divided into two stages: (i) the formulation of a theoretical assumption or hypothesis on the basis of introspection, and (ii) the validation or rejection of this hypothesis by means of a close study of relevant data. For entity-specific change-of-state verbs, we have departed from the hypothesis that the conceptual structure of verbs will be tightly linked to one of two change schemas, which have been termed A>A' and A>B in Ruiz de Mendoza & Luzondo (2011) (see section 4.2). Thus, verbs that denote a positive change of state (e.g. *blossom*, *swell*, etc.) will necessarily correlate with an A>A' schema (e.g. *The flowers blossomed red*). Alternatively, verbs describing a negative change are more likely to combine with an A>B schema (e.g. *The house burned to ashes*). We have used induction when a close inspection of the data has led us to make generalizations about the semantic make-up of specific verbs. The intransitive resultative construction for the verb *tarnish* shows that even if this verb describes a

⁴⁶ For more information about the implementation and usage of this corpus the reader is referred to Kilgarriff, Rychly, Smrz & Tugwell (2004).

negative change of state it does not display an A>B schema (e.g. *All its golden sequins tarnished into green*, where the verb does not reflect any transcendent change but only the acquisition of a different color). From this we can reach the conclusion that not all the verbs depicting negative changes of state will select an A>B schema, but only those that encode a destructive change affecting the physical integrity of an entity.

In this dissertation we embrace a corpus-based approach in the sense that specific data are viewed as a helpful tool for the refinement and betterment of our initial assumptions. There are two main ways of approaching corpus data, either by adopting a corpus-based or a corpus-driven research. The first one makes use of corpus data to verify or improve the existing linguistic theories, whilst the adherents of corpus-driven linguistics are prone to challenging the theoretical framework that clashes with the data. The corpus-based approach, also called top-down, is deductive since it begins with a theory and uses the corpus to expound, test or exemplify a hypothesis (cf. Tognini-Bonelli 2001: 65). On the other hand, linguists favoring a corpus-driven (bottom-up) approach are fully committed to the integrity of the data as a whole (cf. Tognini-Bonelli 2001: 84). This approach is inductive because the corpus serves as the basis for the elaboration of a theory. Gilquin (2010: 8) suggests that quantitative methods “should not be seen as an answer, but rather as an incentive to ask questions”, “not an end in [themselves], but a starting point for qualitative research” (see also Aarts 2000; de Beaugrande 2002). While the corpus-driven approach is very useful for collocational analysis and to find constellations of related items within texts, among other uses, it is of little value for an analysis of the way lexical items fuse with constructions and the principles that guide this process, which requires a qualitative corpus-based approach. There are empirical studies that combine insights from priming experiments and statistical examples of corpora (Gries & Stefanowitsch 2006; Gries & Wulff 2005,

2009). Although productive, our own approach departs drastically from the one adopted by Gries & Stefanowitsch (2005) and comes closer to standard approach in Construction Grammar and in Cognitive Linguistics, which furnishes us with a qualitative analysis of corpus searches.⁴⁷

Finally, our purpose is to favor a qualitative methodology to the detriment of a quantitative approach, since the former is grounded in the explanation and description of linguistic phenomena while the latter requires a statistical processing of data to elaborate generalizations. McEnery & Wilson (2001: 76-77) contrast qualitative and quantitative analysis showing that, while the former provides greater richness and precision on the data, the latter offers findings that can be extended to a larger population. Nonetheless, since quantification is based on an Aristotelian kind of classification it can generate potentially misleading interpretations. For example, in a quantitative analysis the word *red* must belong to one single class, i.e. either the category ‘color’ or ‘politics’ (as a socialist symbol). A qualitative analysis, on the other hand, would recognize both meanings of this lexical item.⁴⁸ Following a qualitative analysis of the corpora, which involved a rich and exhaustive description of the data, we have offered an innovative viewpoint on the conceptual domain of change and change of possession.

⁴⁷ One observation is in order here. Even though quantitative, the *collostructional* analysis carried out by Stefanowitsch & Gries (2003) and Gries (2003) departs from insights provided by non-quantitative Cognitive Linguistics research. Thus, they make non-critical use of Goldberg’s notion of construction or Taylor’s definition of a prototype for possessive constructions. The use of these controversial notions is pre-theoretical, to say the least, in light of the rigid corpus-driven tenet that principles and laws arise directly from the data. In fact, what their work does is use quantitative methods to refine already existing postulates that have been defined within top-down approaches.

⁴⁸ It is of course possible to sort out this problem through manual differentiation of lexical senses. This has been done in work by Glynn (2004, 2009), who carries out a multifactorial analysis on word and even construction senses on the basis of manually annotated corpora. Again, as we saw above, a pure corpus-driven approach is not always possible since annotation requires the researcher to make use of categories and insights that do not directly arise from a bottom-up analysis of data.

3.3.1. Steps of analysis

Two main stages were followed in this dissertation: (i) an exploratory and descriptive stage in which we chose the sources available for the compilation of the corpus and we identified which linguistic phenomena were relevant and representative enough for our analytical purposes; and (ii) an explanatory or hypothesis validating stage in which we tried to provide accurate explanations for the corpus syntactic behavior relying on semantic parameters.

At the descriptive stage we drew insights from previous work on lexical decomposition by Faber & Mairal (1999) and from Levin's (1993) classification of *contribute* verbs and *entity-specific change-of-state* verbs. Regarding the syntactic behavior of *contribute* verbs, we have studied their (in)compatibility with the ditransitive and the dative constructions, as suggested by Levin (1993: 138). Unlike other *contribute* verbs, the verb *distribute* also selects an *among/between* phrase because of the existence of multiple recipients. Entity-specific change-of-state verbs allow for a wider distributional pattern than Levin (1993: 246-247) has claimed. In addition to the causative/inchoative pattern, entity-specific change-of-state verbs can participate in the intransitive locative/temporal/frequency, intransitive resultative, intransitive causal, intransitive motion, caused-motion, resultative, and *way*-constructions. At this first stage we have also examined the proposals made by FrameNet with respect to entity-specific change-of-state verbs. Unfortunately, only a small number of verbs were contemplated in this database, namely *burn*, *corrode*, *decay*, *molder*, *rot*, *rust*, *swell*, and *tarnish*. In most cases, only literal examples were provided for the verbs under consideration, and even when a metaphorical use is listed no motivation is given for the subsumption of a particular verb into a figurative

sentence. An innovative aspect of our research, if compared to Goldberg's work, is the onomasiological arrangement of the data, which is implicitly accepted by LCM theorists but which has not been given pride of place in the still somewhat programmatic work that has been done.

At the exploratory stage we were more concerned with the selection of a constructionist approach that could account for the idiosyncratic syntactic behavior of the verbs under scrutiny in a parsimonious way. Within the framework of CxG, Goldberg's (1995, 2006) model stands out, but her broad-scale lexical entries cannot accurately predict the syntactic behavior within a particular verbal class. For example, the verbs *donate* and *contribute* share the same minimal set of participant roles (cf. donate <**donor donation donee**>, contribute <**contributor contribution goal/contributee**>), but only the former is allowed to fuse with the ditransitive construction (e.g. *She donated him her kidney*). From this we can infer that lexical entries are not sufficient to explain the difference between these two verbs at the syntactic level. Therefore, the best solution to this problem was to find a model that gives more prominence to lower-level configurations and the lexical information associated with them. A coherent lexical-constructional model is the one propounded by Boas (2000, 2002, 2003). Nevertheless, Boas's focus on mini-constructions is excessive, to the detriment of high-level constructions, their argument structure contribution and the possible principles that regulate the interaction between verbs and constructions. In this connection, there are two main reasons why we have turned our attention to the LCM. As we saw in section 2.9, this model offers a wider range of factors licensing or blocking the subsumption between predicates and constructions, without disregarding the role of metaphor and metonymy. Furthermore, the LCM is

largely implementable computationally, as evidenced by the latest developments of FunGramKB.

Chapter 4

Entity-specific change-of-state verbs and *contribute* verbs

4. 1. Preliminary remarks

The main concern of this chapter is to provide an in-depth lexical-constructional analysis of entity-specific change-of-state and *contribute* verbs. The thorough examination of a large size corpus (i.e. the Sketch engine) demonstrates that entity-specific change-of-state verbs display a much richer variety of configurations than Levin (1993) has claimed. Also, although FrameNet serves to document the distributional range of the verbs under scrutiny, it will be shown at a later stage that this database is often incomplete and it does not offer any conceptual motivation for the lexical-constructional behavior of these verbs. To account for the lack of onomasiological verbal taxonomies, FrameNet lexicographers claim that this database does not duplicate the work carried out by other thesauri based on relational approaches, such as WordNet or EuroWordNet (cf. Atkins *et al.* 2003: 272). Not only does the present dissertation explain the cognitive principles that regulate the subsumption processes of the verbs under study, but it also shows how these verbs relate to their hyponyms and hyperonyms and how inheritance of conceptual structure affects constructional behavior. Regarding the syntactic distribution of *contribute* verbs, it will be argued that an exclusively lexicalist approach like the one propounded by Levin (1993) is not the key to their integration into the dative construction.

This chapter is structured as follows. In sections 4.1.1 and 4.1.2 we present a descriptively and explanatorily adequate account of all the constructions entity-specific

change-of-state verbs are integrated into: the intransitive locative/temporal/frequency, intransitive resultative, intransitive causal, intransitive motion, causative, caused-motion, resultative, and *way*-constructions. 4.2 includes the classification of entity-specific change-of-state verbs into three main groups according to their conceptual similarity and the change schemas they are likely to select. Sections 4.2.1 and 4.2.3.1 offer a complete outline of the approach adopted by FrameNet for these verbs, as well as its shortcomings. Sections 4.2.2 and 4.2.3.2 discuss the perspective of the LCM on the complementation patterns of entity-specific change-of-state verbs. Section 4.2.3.3 centers on the conceptualization of emotional and non-emotional causality with these verbs, whereas section 4.2.4 describes the elaboration of onomasiological hierarchies for these verbs. Section 4.3 introduces the reader to the ditransitive and the dative constructions. Section 4.3.1 critically reviews Levin's (1993) semantic criterion for *contribute* verbs, whereas section 4.3.2 enumerates the factors that motivate their lexical-constructive behavior. Finally, the limitations of the treatment offered by FrameNet for these verbs are identified in section 4.3.3.

4.1.1 The intransitive locative/temporal/frequency, the intransitive causal and causative constructions

We have decided to group together the intransitive locative, temporal and frequency constructions both for economy reasons and because these three constructions have similar formal structure: NP1 V AdvP-*location/time/frequency*. The adverbial phrase expresses in each case the place ([...] *the Apache helicopters are resting in the mud of Tirana*; Sketch engine doc#21732), the time (e.g. [...] *earthly mountains grow and erode over millions of years*; Sketch engine doc#745906), and the frequency of an

event (e.g. *The caterpillar goes through many growth stages, molting a various number of times [...]; Sketch engine doc#417920*). We can also witness a combination of these adverbial phrases as in *After moldering nearly 11 months on the Weinstein shelf, Grace is Gone opened last month to lukewarm praise [...]* (Sketch engine doc#1851466), where the reader is supplied with information about both the location and time when an event takes place. It is not very uncommon to find that the adverbial phrase can be lexicalized by a figurative location, since entity-specific change-of-state verbs can occur in metaphorical instantiations (e.g. *Motives ferment in the minds of great bodies of men, [...]; Sketch engine doc#37521*).

The intransitive causal pattern is another construction that has been understudied by grammarians. This pattern matches easily with entity-specific change-of-state verbs probably because speakers need to assign causes to processes occurring in nature. The verbs under consideration give rise to the following intransitive causal configuration: NP1 V *with/in/from/under* NP2, in which various prepositions can make the connection between the action encoded by a verb and the cause underlying that action. The preposition *with* is polysemic, since it is employed to express instrumentality, company, causality and even result, as will be shown at a later stage of our discussion. The boundary between these four notions becomes sometimes fuzzy. For example, the sentence *Napoleon destroyed the city with his army* can puzzle the reader who is indecisive as to what gains more conceptual prominence in this utterance, company, instrumentality or both. We tip the balance in favor of a conflation between company and instrument because Napoleon is accompanied by his army in battle and at the same time he uses his soldiers as an instrument to achieve his goals, in this case the destruction of a city. But what about the role of *with* in the oft-cited sentence *He broke the window with a hammer*? If there were no conflation between instrumentality and

causality, how else would we be able to explain the possibility of promoting the hammer to a subject position as in *The hammer broke the window*? Another sentence which undoubtedly stresses the causer role of the preposition *with* is *John died with pneumonia*, where the disease becomes the cause of John's dying. We relate this example to another one which makes use of an entity-specific change-of-state verb, viz. *The garden flowered with roses* (Levin 1993: 251). An alternate construal of this event would be illustrated by an intransitive locative construction as in *Roses flowered in the garden*. The intransitive causal and locative constructions were analyzed together in the linguistic literature and were denominated with the term *swarm* alternation (cf. Anderson 1971; Salkoff 1983; Levin 1993; Dowty 2001). This form is considered to be the intransitive counterpart of the locative alternation shown by *spray/load* verbs in their transitive use (cf. *John sprayed paint on the wall/John sprayed the wall with paint* vs. *John loaded hay onto the truck/John loaded the truck with hay*)⁴⁹. Dowty (2001) offers an exhaustive characterization of the *swarm* alternation, by relying heavily on Salkoff's (1983) observations. In his terminology, the intransitive locative construction (e.g. *Bees swarm in the garden*) is called an AGENT-SUBJECT (A-Subject) form whereas the *with* pattern (e.g. *The garden swarmed with bees*) is termed LOCATION-SUBJECT (L-Subject) form. Dowty (2001: 8) is not so much concerned with the A-Subject form (e.g. *Ants are crawling on the bed*) simply because it does not have any peculiar semantic or syntactic features which differentiate it from other sentences like *Ants are dying on the bed* or *Four ants are crawling on the bed*. Contrary to Levin (1993), Dowty (2001) enumerates only five verb classes that appear in the L-Subject form, i.e. light emission verbs (*beam, burn, blaze, twinkle, etc.*), the sound emission verb class, in which he includes animal sounds and Levin's (1993) sound existence

⁴⁹ For an in-depth analysis of the transitive locative alternation the reader is referred to Goldberg (2002), Nemoto (2005), and Iwata (2008).

verbs (*buzz, chatter, echo, resonate, etc.*), degree of occupancy/abundance verbs (*teem, rife, abound, throng, etc.*), verbs denoting small local movements which occur repetitively (*flutter, pulsate, gush, ooze*; in this class he merges two of Levin's (1993) classes, namely substance emission verbs and verbs of modes of being involving motion), and verbs describing smells and tastes (*reek, smell, taste, be fragrant, etc.*). Nonetheless, he leaves out Levin's (1993) verbs of entity-specific modes of being (*bloom, blossom, sprout, bristle*). Among the most salient properties of the L-Subject construction, Dowty (2001) mentions:

(i) The *holistic/partitive* dichotomy. According to this, the L-Subject form entails that the activity denoted by the verb fills the whole location, whilst this is not the case with the A-Subject form. For the sake of clarity, compare the entailments of the A-Subject and L-Subject constructions: *Bees are swarming in the garden, but most of the garden has no bees in it* vs. *#The garden is swarming with bees, but most of the garden has no bees in it*. The A-Subject construction implies that the cluster of bees occupies only a small area of the garden, whereas the L-Subject construction suggests that the swarm of bees is distributed over the whole garden.

(ii) The *with* pattern is an indefinite plural or mass term, but never a singular NP (cf. *The wall crawled with roaches*/**The wall crawled with a roach*, Salkoff 1983: 292; *The garden buzzed with flies*/**The garden buzzed with the big fly*). However, the final NP position can be filled with a noun specifying an estimated amount, but not a precise enumeration (cf. *The garden swarmed with a hundred bees* vs. *?The garden swarmed with fifty-three bees*). As an exception to this rule, Dowty (2001: 3) formulates the sentence *The whole school buzzed with the rumor about the librarian dating the principal*, where the sound emission verb alludes to many

re-tellings of the rumor by different people in the school. In this connection, the LCM contends that the reason why the *with* pattern can never combine with a singular NP is given by the Internal Variable Conditioning constraint. According to this, the predicate of an L-Subject form, which already implies a large number of small entities, constrains the nature of the following constructional argument, which cannot be lexicalized by a single entity. The second use restriction of the *with* pattern (the combination with an estimated amount) has a perceptual motivation grounded in the logic of the SUBSTANCE and COLLECTION image-schemas. In discussing the multiplex-mass image-schema transformation, Lakoff (1987: 442) points out that “as one moves further away, a group of individuals at a certain point begins to be seen as mass. Similarly, a sequence of points is seen as a continuous line when viewed from a distance”. Hence, we visually perceive collections consisting of bounded individuals as unbounded entities (i.e. substances) and in an approximate way. Lakoff (1987) supports the existence of a metaphorical operation that lies at the base of this kind of transformation, namely COLLECTION IS MASS. For example, the sentence *The fans poured through the gates* relies on the aforementioned metaphor, whereby we conceptualize aspects of the perceived behavior of a collection of people in terms of corresponding aspects of the observed behavior of flowing liquids. Peña & Ruiz de Mendoza (2009) demonstrate that in addition to the multiplex-mass transformation, this expression is also motivated by the metonymic mapping PROCESS FOR ACTION. This metonymy enables us to see a controlled movement as if it were uncontrolled spontaneous motion.

(iii) When the verb of an L-Subject construction is a sound verb, the *with* pattern is more natural with a sound expression than the agent or instrument that produces

that sound (Salkoff 1983: 307; *The barnyard cackled with the calls of geese* vs. *The barnyard cackled with geese*).

(iv) Salkoff (1983) himself remarked that the L-Subject form is highly productive in metaphorical instantiations such as *Fireflies danced in the garden/The garden danced with fireflies* or *Visions of success danced in his head/His head danced with visions of success* (Dowty 2001: 4). The same verb is disallowed in an L-Subject form when used with a literal meaning (cf. *Lovely couples danced on the stage* vs. **The stage danced with lovely couples*). Dowty (2001) provides no explanation for the unacceptability of a literal sentence like **The stage danced with lovely couples*. We contend that, in the non-figurative use of *dance*, there is a conceptual clash between this verb and the L-Subject constructional pattern, which requires a verb that denotes manner of filling up a location. World-knowledge information about the dancing activity tells us that in choreography there is a visually balanced spatial distribution and the motion of the couples has to be perfectly coordinated. Therefore, the dancing couples have to be visually separated to give a harmonious impression, thus leaving large portions of the stage uncovered. On the other hand, in the figurative use, it is possible for the “dancing” entities (i.e. fireflies, thoughts) not to involve any coordinated motion, but rather a chaotic movement provided that such motion takes up all parts of a given space.

(v) *The Dynamic Texture hypothesis*. The events described by the verb of an L-Subject form happen simultaneously and repetitively throughout all parts of a place or space. The cluster of activities is so encompassing that it creates a “texture of movement” in the surface as a whole. The perception of the movement-texture in the surface becomes more salient than the individual events

or agents (cf. **The table crawled with the ant on the right side*). So, the focal requirements of the L-Subject construction are the following: 1) a location must be entirely filled with individual entities or the sound produced by those individual entities (e.g. *The forest resonates with buzzing insects*); or 2) there must be a visual illusion that the space is completely filled up through repeated movements scattered all over the surface (e.g. *The garden danced with fireflies*).

Coming back to the examples in our corpus (*The garden flowered with roses/Roses flowered in the garden*), it is worth noting that they are also subject to the holistic/partitive effects in the sense that the whole garden seems to be affected by the blooming process in the L-Subject construction. The lack of agentivity in the L-Subject construction as postulated by Levin (1993: 54) is highly debatable for two main reasons. First, we should neatly differentiate between the syntactic function of subject and the semantic function of agent. In this connection, Dik (1997: 37) has posited the existence of three different types of functions for any construction: (i) syntactic functions, such as subject, object or other terms without a subject/object function; (ii) semantic functions, such as agent, goal, recipient, beneficiary, instrument, location or time; and (iii) pragmatic functions, such as topic and focus. In a sentence like *John broke your china* the NP *John* fulfills simultaneously three different functions, that of subject, agent, and topic (i.e. a piece of information that is known to the speakers), whereas the NP *china* is an object, a patient, and a focal element at the same time (i.e. a piece of information that is new to the speakers). But the coincidence of these three functions is not always the case. Consider for contrastive purposes the utterance *JÓHN broke your china (not Jim)* in which *John* is the subject and agent, but it constitutes the focal element of the sentence. The marked stress suggests that the speakers did not know the identity of the

person who broke the china. Dik (1997) also claims that the assignment of subject and object can be understood in terms of the notion of perspective, which is the point of view from which a state of affairs is presented in the linguistic expression. A similar view is supported in Langacker's (1987, 1990, 1991ab, 2005) Cognitive Grammar. This author equates the subject with the notion of *trajectory* (TR) and the object with the *landmark* (LM), respectively. The former is the most salient element or the primary figure in a profiled relationship, whereas the latter stands out as the second focal element or the secondary figure. Thus, according to Langacker (2005: 111) the participant that receives primary focus becomes the subject and the participant that receives secondary focus is the object or the oblique NP. The LCM agrees with the aforementioned positions and claims that a prototypical subject is also expressed by a prototypical agent. It postulates that syntactic functions derive from semantic functions that have undergone a process of desemantization. This process gave rise to more marginal transitive or intransitive constructions, such as the instrument subject construction (e.g. *The hammer broke the window*) or the middle construction (e.g. *This book sells easily*).

Second, we consider that there is a cline of agentivity ranging from the most prototypical cases to more marginal members. Drawing on Lakoff (1977) and Hopper & Thompson (1980), Taylor (1995: 207) characterizes a prototypical agent by enumerating the following features: (i) consciousness and volition: the agent is typically a human being who has control over the event and the action is carried out purposefully; (ii) the agent acts upon an inanimate patient through direct physical contact, and the effect on the patient is immediate and leads to a change of state. Radden & Dirven (2007: 288-291) discuss non-prototypical agents and classify them into two main groups: agent-like causes and enabling causes. The first category comprises natural

forces (e.g. *Katrina devastated New Orleans*), instruments (e.g. *Guns don't kill people, people kill people*), or other generic causes (e.g. *The strike closed down the railway system*). In the instrument subject construction an agent who acts on the instrument is implied. Nevertheless, it is agreed that the instrument has a certain degree of independence from the agent, as if it were somehow acting on its own. Nevertheless, instruments cannot be coordinated with agents (**Guns and gangsters kill innocent people*) or carry out deliberate actions (**Guns kill people for fun*).

The middle construction is another case of non-prototypical agentivity, where the agent takes the subject position. Consider the sentence *This book sells easily*. Radden & Dirven (2007: 290) argue that an internal quality of the book acts as an enabling condition that influences its sale. That is why external agents cannot be added to the middle construction (cf. **The book sold easily by the bookseller*). Taylor's (1995: 217) work offers a similar perspective on the middle construction which "seems to highlight the contribution of the merchandise itself (e.g. the fact that the book appeals to a wide audience) to the high sales figures". A related sentence, e.g. *The key opened the door* is based on the same kind of explanation, i.e. the successful opening of the door depends greatly on the properties of the key. Ruiz de Mendoza & Mairal (2007: 385) show that the middle and instrument-subject evaluative constructions contribute an evaluative ingredient that can affect either the process or the result components of the PROCESS FOR ACTION FOR RESULT high-level metonymy. Figure 4.1 below constitutes a graphical representation of the PROCESS FOR ACTION FOR RESULT metonymy, where either the process or the result component is highlighted depending on the adverbial phrase following the verb:

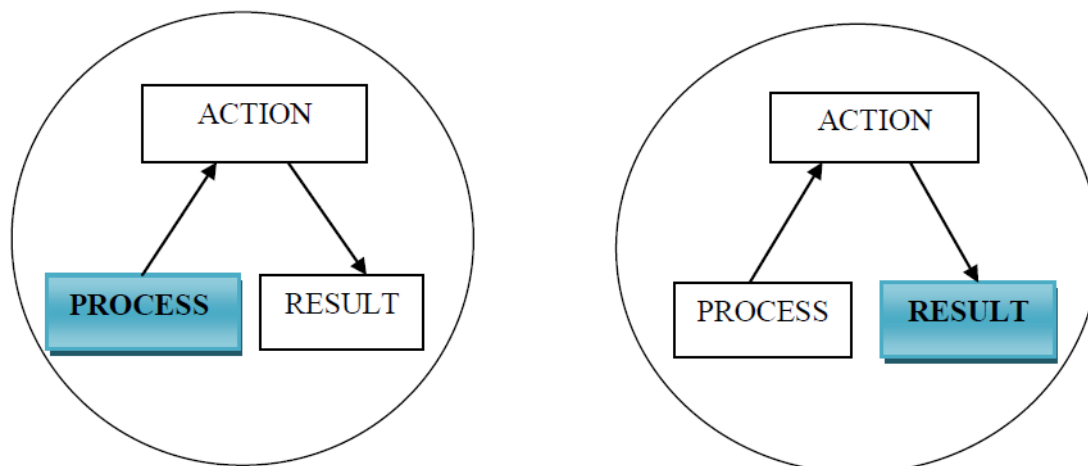


Figure 4.1 Highlighting in PROCESS FOR ACTION FOR RESULT

For instance, in the sentence *This book sells easily*, it is the process that is evaluated, as revealed by the paraphrase *It is easy to sell this book*. By contrast, the adverbial phrase *well* in *This book sells well* assesses the result of the book sale (cf. **This book sells/*It is well to sell this book*). Therefore, the choice of the adverbial phrase determines what part of the high-level metonymic chain is being exploited, i.e. *easily* focuses on the initial source domain (the process) while *well* highlights the final target domain (the result). In this connection, our L-Subject construction (*The garden flowered with roses*) makes use of a non-prototypical agent, such as a location, whose internal quality (a good state of the soil, for example) acts as an enabling condition influencing the flowering process of the roses. This L-Subject construction is a clear instantiation of what Halliday & Matthiessen (2004) have labeled *non-congruent grammatical realization* and can be contrasted with its intransitive locative congruent version, i.e. *Roses flowered in the garden*. The LCM contends that the L-Subject construction is licensed by the high-level metonymy A PROCESS (IN A LOCATION) FOR AN (INSTRUMENTALLY) CAUSED EVENT (Ruiz de Mendoza & Pérez 2001;

Ruiz de Mendoza & Peña 2008). The metonymy is illustrated in the diagram displayed below:

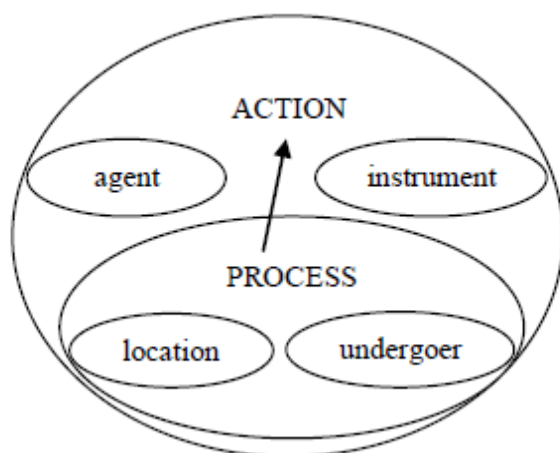


Figure 4.2 A PROCESS (IN A LOCATION) FOR AN (INSTRUMENTALLY) CAUSED EVENT metonymy

Figuratively, on a high-level of meaning construction, we treat the garden as if it were able to “bloom” by making use of its flowers. Thus, the process of blooming, which typically has only one participant role, viz. an undergoer (the flowers), occurs in a given place/location. In an L-Subject construction this process metonymically stands for a caused event in which a volitional agent uses an instrument of action.

In our corpus we have come across many figurative intransitive causal constructions. Consider the example [...] *this movement blossomed* with the opening of more than 20 schools *offering programs in Naturopathic Medicine* (Sketch engine doc#216733), in which the opening of schools is the cause of the flourishing of the movement. Nevertheless, we should note that our example has deviated somewhat from an L-Subject form since the subject *movement* is no longer a location. The development of an ideological movement is metaphorically seen as the blossoming process undergone by flowers and schools do not have the ability to literally blossom the

movement, but they can propel it. This sentence can be compared with *The leaves blew with the wind*, where the wind caused the leaves to move in the air. There is a low-level metonymy from “intentionally caused motion by expelling a current of air through the mouth” to “non-intentionally caused motion through the creation of a current of air (wind)”. In the previous example, the low-level metonymy shifts from a non-intentional enabling action (cf. *The flowers blossomed with the sun*/**The sun blossomed the flowers*, the sun is only a co-causal factor of the blossoming process) to an intentionally caused action which makes an ideological movement thrive (cf. *Schools were opened by the government*, but it is odd to say *?The opening of schools blossomed the movement* because this action only enables the flourishing process).

As mentioned earlier, the intransitive causal construction can accept a wide range of prepositions, such as *with*, *in*, *from*, or *under*. The sentence *The camera blossomed in the hands of indigenous photographers as colonialism waned and the ghanaians adopted photography for themselves* (Sketch engine doc#684231), makes use of a causal *in* preposition. The idea of causation in this utterance could not have been expressed by means of the preposition *with* because the NP *hands* collocates in a natural way with the preposition *in*, which activates the CONTAINER schema (the camera was held in the hand by the indigenous people). Again, the verb *blossom* is exploited metaphorically to suggest that the indigenous people developed the photographic techniques. Also, holding an object in your hand is conceptually associated with possession or exertion of control over that entity. The use of the entity as an instrument to perform an action can be finally linked to the idea of causation (e.g. a gun that you hold in your hand can become a tool to kill a person). Ruiz de Mendoza (personal communication, 2012) contends that there is a continuum in cognitive processing which leads from the position of an object in a given location to the abstract domain of

causation: IN-location in a container [*hands*] > possession of object > instrumentality > causation. Note that the scene of an object located in a container is the most basic and as we move forward along the continuum the relations between entities become more complex.

This idea is strongly reinforced by Grady & Johnson's (2002) developmental model of primary scenes and primary metaphors. In their work they provide compelling evidence from children's acquisition process of grammatical constructions in order to demonstrate the existence of subscenes which are built into more complex scenes for the creation of primary metaphors. According to them, subscenes are situated "at the lowest level of cognitive processing to which we can consciously attend—that is, they are self-contained dimensions of subjective experience" (Grady & Johnson 2002: 552). They predict that the possessive meaning, which corresponds to a subscene, is learned first whereas the instrumental meaning is learned relatively late, since it requires the acquisition of a complex scene which involves the relation between an object, a person, and an activity (Jackendoff 1990). Johnson (1997) shows that children treat an example like *What are you doing with the knife?* as a normal *Wh*-question, i.e. as a literal question about an activity, and not as an instance of the *WXDY* construction, which refers to the incongruity of the addressee's holding that object. Grady & Johnson (2002) explain that this is possible because such sentences can receive two interpretations depending on the meaning assigned to the preposition *with*. Children obviously interpret it as a possessive preposition (cf. *John stood in the doorway with a knife*) because this is the simplest explanation and it corresponds to a subscene. The second interpretation, which is based on the instrumentality of the preposition *with*, requires the activation of a relatively complex scene in which a person uses an object to perform an action. Therefore, the complex scene of a person using an instrument of action includes the

simple subscene of a person possessing or holding that instrument. To conclude, the possessive meaning is subsidiary to the causation meaning.

Another preposition which can evoke causality is *from*, e.g. *Frescoes generally became dark or decayed from moisture [...] (Sketch engine doc#137647)*. Through an elaborate cognitive process, we can understand what allows *from* to become causal. This preposition cues the activation of the PATH schema, and more specifically a portion of it, viz. the starting point. The starting point of a path is thus related to the state or quality of being damp (*moisture*) by means of an underlying primary metaphor STATES ARE LOCATIONS (cf. Lakoff 1993, for a preliminary discussion of this metaphor). It is very interesting to notice how the human mind brings together three apparently different domains: states, locations, and change. The verb *decay* highlights the final state of the frescoes, indicating that the affected entity has now reached the final point of a path (cf. A CHANGE OF STATE IS A CHANGE OF LOCATION). In a naive interpretation of the world the source of motion is mixed up with the cause of motion because at the source of motion it is where we have the conditions that trigger off motion. Therefore, in the human mind the initial state conflates with both source of motion and cause. Correspondingly, a final state would correlate with the destination of motion and the resultant state (cf. *The rotten brick decayed to dust; Sketch engine doc#1046209*).

Conflation involves the human mind imposing its own patterns onto reality, which is far from being objective. But this idea is not new and we can trace its roots back to the phenomenologist revolution in philosophy initiated by Merleau-Ponty (1945, 1962). The basic tenets of his ideological movement, which laid the foundations of Cognitive Linguistics, are thoroughly discussed in Dirven & Ruiz de Mendoza (2010: 37-38). Merleau-Ponty highlights the role of human consciousness and intentionality in the joint

interaction of the body and the mind with the surrounding environment. Moreover, embodiment does not concern only the body, but it is rather a matter of the mind through the body. The philosophical postulates of Merleau-Ponty (i.e. the notions of experientialism, realism, and the assumption of an embodied mind) are also stressed by Violi (2008), who blends Merleau-Ponty's ideas with Peircean semiotics:

Through perception the subject meets the world in the first place and begins to give meaning to it. Phenomenological and perceptive meaning is transformed into linguistic meaning through the *corp propre* [lived body] which founds, at one and the same time, the subjectivity of consciousness and the exteriority of the world. Here we can see another possible compatibility with Pierce's philosophy: in Merleau-Ponty's phenomenology, too, external and internal world are not separate and in opposition with one another, but related to each other via the mediation of the *corp propre* that operates, in a way, as translator of perceptually constructed meaning into linguistic and conceptual meaning.

Thus, it is made clear that the human perceiver imposes his/her subjective structure on the things perceived. Meaning is created in the body, through perception which is "not merely the simple and passive record of an external world", but rather "the active construction of a world already endowed with meaning and intentionality" (Violi 2008: 57).

Causal *from* can also be used in metaphorical instantiations like the following *I observed an industry that was dying and decaying from a lack of interest by investors* (Sketch engine doc#1331977), where the refusal of investors to invest money in the industry represents the negative cause of a state of affairs. The absence of financial investment is what causes the industry to be in a state of neglect and this leads eventually to its lack of functionality, which is expressed by the verb *decay*.

Finally, the preposition *under* can also appear in a causally construed semantic environment, as stressed by the sentence *But the plant soon wilted under the hot sun, and since it didn't have deep roots, it died* (Sketch engine doc#2335524). *Under* is a

spatial concept designating a lower position of an entity in contrast with another one that is situated on top of it. Even though no motion is entailed, the three conceptual domains of location, state, and change are still inextricably interwoven. The reader is left to infer the state of the plant whereas the verb *wilt* pinpoints the final event which was obviously generated by the weak condition that the plant was in. As in the case of *from*, the preposition *under* takes part in figurative intransitive causal expressions, e.g. *Friends of White said his health wilted under the strain of both confronting priests and comforting victims* (Sketch engine doc#970). In this sentence the aggravation of a person's state of health is metaphorically mapped onto the wilting process of a flower probably because people's health is considered to be as fragile as a flower whose growth depends greatly on favorable environmental conditions. The noun *strain* is also employed figuratively; it maps a concrete situation in which a heavy entity exerts real physical pressure on another one located underneath (e.g. *Extra fat puts a strain on the heart, kidneys, liver [...]*; Sketch engine doc#340711) onto a situation in which life problems exert mental pressure on a person's mind. The verb *wilt*, which depicts the natural process of degradation of a plant, is a mild substitute of more violent action verbs like *break*, *snap*, or *collapse* (e.g. *The waves travel outward from the spot where rocks of the earth's crust snapped under the strain*; Sketch engine doc#849053). Mention should be made of the fact that the causal expression *under the strain* can only be associated with a negative final condition of an affected entity (cf. *?Mary blossomed under the strain of managing both a family and a career*).

The causative construction with the semantics S/NP1 V OBJ/NP2 (e.g. *The wind opened the window*) describes the bringing-about of a change of state. It is often integrated into more complex constructions, such as the conative, the caused-motion and the resultative constructions, thus giving rise to what Ruiz de Mendoza &

González (2011) have called a *constructional amalgam*. Some examples from our corpus are confounding in the sense that they share the syntactic form of causatives but the subject of such sentences cannot possibly fulfill the role of a prototypical agent. Let us consider two of them, i.e. *It [the Horseshoe Crab] molts its skin many times as it grows* (Sketch engine doc#421040) and *A young man's little boy sprouts a horrible brain tumor [...]* (Sketch engine doc#51648). To what extent can we say that crustaceans, birds, dogs or other animals that undergo molting are directly responsible for this natural process which is part of their growth? Experts claim that molting is a hormonally controlled process during which an animal loses its feathers/exoskeleton/skin, which is replaced with a new one or a new set of feathers. Likewise, the boy suffers from a disease but we cannot say that this negative outcome is something that he might have caused voluntarily.

4.1.2 Resultative constructions

This section is exclusively devoted to the examination of the network of resultative constructions which encompasses the caused-motion construction, the *way* construction, and the intransitive motion construction (cf. Goldberg & Jackendoff 2004; Luzondo 2011). The resultative is a (goal-oriented, generally telic)⁵⁰ type of transitivity pattern which specifies the outcome of a change of state, property or location undergone by a person or an object. This configuration has witnessed a remarkable surge of interest

⁵⁰ A telic state of affairs involves a situation that has an inherent terminal point. Goldberg & Jackendoff (2004: 542) expand upon the notion of telicity, showing that resultatives can also be atelic. For example, the AP construction *A-er and A-er* (e.g. *For hours, the mixture got hotter and hotter/The blacksmith hammered the metal flatter and flatter for hours*) expresses an atelic change of state. Also, resultatives can combine with non-end-bounded spatial PPs (e.g. *Jim floated down the river for days*). Resultatives are prototypically telic, but a resultant state can be seen as if in a process of becoming such through a specification of its stages, which renders the actual result implicit, or through iteration: *He danced mazurkas over and over again for hours*.

from various theoretical frameworks: formalism (e.g. Hoekstra 1988; Levin 1993, 2006; Rothstein 2004), functionalism (e.g. Halliday 1967), and constructionist approaches to language (e.g. Boas 2002, 2003, 2005ab, 2008ab, 2010; Broccias 2000, 2003, 2004; Goldberg & Jackendoff 2004; Iwata 2006). In this dissertation the study of the resultative construction will be carried out from the perspective of the LCM, which inscribes itself within the larger framework of Cognitive Linguistics and the constructionist views. As far as the aspectual distinction is concerned, Rothstein (2004: 81) underlines that the resultative construction derives an accomplishment predicate from an activity. Compare the sentence *John hammered the metal for hours/*in three hours* with *John hammered the metal flat *for hours/in three hours*. The former encodes an atelic activity whereas the latter shifts to an accomplishment reading through the imposition of the culmination modifier *flat*. Following Simpson (1983), Levin & Rappaport (1995) have postulated the “Direct Object Restriction” (DOR) on resultative constructions: resultatives can only be predicated of direct objects. This can be illustrated by the canonical resultative sentence *John painted the house_i green_i*, where the Adjectival Phrase *green* is co-referential with the direct object *house*. Verspoor (1997: 150-51) and Wechsler (1997: 313) have challenged the validity of the DOR, by providing examples of subject-oriented resultatives with transitive verbs:

(1) *The wise men followed the star out of Bethlehem.*

(Wechsler 1997: 313)

(2) a. *John danced mazurkas across the room.*

b. *John swam laps to exhaustion.*

c. *The children played leapfrog across the park.*

(Verspoor 1997:151)

These two authors argue that the result is predicated of the subject of the sentence due to a semantic relation between the subject and the object. In spite of the existence of subject-oriented transitive-based resultatives, Rappaport & Levin (2001) do not retract the DOR which applies in most cases. They also point out that these examples denote a result location and not a result state, although they seem to have overlooked the fact that the NP *exhaustion* in (2b) is a result state which is metaphorically seen in terms of a location through the metaphor CHANGES OF STATE ARE CHANGES OF LOCATION. Example (1) is a clear instantiation of what Croft (2000: 95-96) has termed ‘correlated motion’, i.e. the position of the subject is correlated with that of the object. On this reading, the result XP describes in fact the position of the reference object (the star), which constrains the motion of the subject. According to Croft (2000: 97), examples (2a) and (2c) refer to the creation of a specific performance (the mazurka and the leapfrog, respectively), which is encoded by the object: the performance itself traverses a path as it is created, thus determining the subject’s own path. An observation made by Rothstein (2004: 88) is that the directional PP (prepositional phrase) in examples (2a) and (2c) depicts a bounded path and when this rule is flouted the object-oriented resultative construction sounds odd (cf. *?John danced himself about the house*).

Broccias (2000: 44) cites the example *She rode the horse to town* to evidence that sometimes the XP result can be predicated of both the subject and the object: once the action denoted by the verb is over the subject and the object are in the same place. Furthermore, Broccias (2000: 43) brings into consideration a peculiar type of resultative constructions which imply a unidirectional energy flow from subject to object⁵¹ and

⁵¹ This terminology was inspired by Langacker’s (1991ab) Cognitive Grammar. Langacker introduces the notion of the *billiard-ball model* that lies at the basis of any prototypical finite clause (i.e. objects moving in space make contact with one another and engage in energetic interactions). This cognitive model is tightly connected to the *action chain*, which is portrayed as a domino series of energetic interactions

establish a body-part relation between the direct object and the complement of the PP, e.g. *The sea air slapped me in the face/It cut me to the heart*. This type of resultative was also found in our database, which was instantiated by the verb *corrode*, e.g. *Alcohol abuse by parents can corrode young children to the core of their being* (Sketch engine doc#703514). This sentence preserves the DOR and it shows the degree of affectedness of the direct object by a figurative self-part relation between the patient (children) and the complement of the PP (core of their being).

According to Goldberg (1995: 193-198) the semantic constraints of resultatives are the following:

- (i) The first argument must be an animate instigator (e.g. **The pint drank the pub dry*). Nonetheless, this constraint is violated by sentences like [...]*the screw swinging the door open for her at just that moment* (Sketch engine doc#713566) or *The draught blew the door open* (Sketch engine doc#2322815).
- (ii) The second argument undergoes a change of state. Verspoor's (1997) sentence *I love you to distraction* is a clear counterexample for this general constraint, since the object may be unaffected by the subject's feelings (i.e. the object may not even know what the subject is feeling for him/her).
- (iii) The change of state must happen simultaneously with the endpoint of the action described by the verb (cf. also Talmy 1996, Rappaport Hovav & Levin 2001). Thus, the adjective *open* in the sentence *She slammed the door open* denotes the final resulting event whilst the verb *slam* represents a prior causal subevent. In Rosca (2012ab) it has been shown that the temporal dependency

between objects. The action chain depicts a flow of energy moving from an *energy source* to the final *energy sink* (theme).

between the verb and its result is motivated by a subcase of the Event Identification Condition, an internal constraint in the LCM, which concerns the proper identification of events. The verbal slot can only be filled by the temporal subevent that is closer to the resulting event, i.e. the sound production and not, for example, the hitting event (cf. **I hit the door open*).

(v) The result is typically expressed by a ‘non-gradable’ adjective⁵² (Sapir 1944). Nonetheless, this semantic constraint clashes with our previous observations related to the sentence *The blacksmith hammered the metal flatter and flatter for hours*.

(vi) The result in an adjectival resultative cannot be derived from a present or past participle (cf. **The man painted the house redden/reddening*).

From a lexicographical perspective, Faber & Mairal (1999: 161) argue that the resultative construction usually combines with iterative verbs which specify a repeated action leading to the attainment of a final state. The ungrammaticality of a **The captain flogged the man senseless with only one whip* indicates that the result (loss of consciousness) is achieved by the application of several strokes of the whip. What is more, the resultative construction selects adjectives that encode achievements for the result slot, such as *unconscious, sick, flat, blind, or silly* (e.g. *The thought of his going away worried her sick, The Minister of Defense robbed the government blind, She laughed herself silly*, examples extracted from Faber & Mairal 1999: 168). We would like to point out that the sentence *The Minister of Defense robbed the government blind* has a resultative format but it is in fact a non-prototypical case of resultative

⁵² A gradable adjective is one that accepts degree modifiers (e.g. *It is rather cold today*) and that has comparative and superlative forms, e.g. *angry, happy, tall, or busy*. In contrast, a non-gradable adjective is incompatible with degree modifiers (cf. **He is rather dead*) and has no comparative or superlative forms, e.g. *freezing, impossible, nuclear, chemical*.

construction. The adjective *blind* does not express a resultant state that is caused by the robbery but a state that facilitated the action denoted by the verb. Thus, the EFFECT FOR CAUSE metonymy licenses the use of *blind* in the resultative pattern.

Lastly, a verb like *destroy* cannot be subsumed into the resultative construction (cf. **The CIA destroyed the videotape to pieces*). The LCM demonstrates that the blocking is motivated by the Lexical Class internal constraint. The result *to pieces*, which hints at visual fragmentation of an entity, is incongruent with the verb *destroy* which encodes cessation of existence (i.e. disappearance of an entity). As argued by Goldberg & Jackendoff (2004: 538) the meaning of a resultative construction contains two separable subevents: a verbal subevent determined by the predicate, and a constructional one, imposed by the construction itself. The first is the means by which the second takes place. Thus, the sentence *Willy watered the plants flat* can be paraphrased as *Willy caused the plants to become flat* [constructional subevent] *by watering them* [verbal subevent]. The resultative construction can be semantically schematized as [LS1] CAUSE [LS2], where the first template [LS1] can have two different representations depending on the aspectual type of the predicate (e.g. **do'** (x, [**pred'** (x, y)]) for activities, and **do'** (x, Ø) CAUSE BECOME **pred'** (y) for causative accomplishments) whereas the second lexical template comprises a BECOME operator and a nucleus which is filled either by an adjectival or a prepositional phrase.

The constructions exemplified in (3) are considered to be tightly connected with the canonical resultative pattern (e.g. *John hammered the metal flat*):

- (3) a. *The man threw the bag into deep water.*
- b. *The officers ordered him out of the building.*
- c. *The media mocked and ridiculed him out of the ministry.*

d. *The woman kissed me into ecstasy.*

The examples in (3) are all instantiations of the caused-motion construction, which displays the semantics X CAUSES Y TO MOVE Z, where the Z element denotes the path of motion expressed by the Oblique or directional PP (prepositional phrase). This PP is a composite predicate that signals motion along a path to a destination (*to*), where the destination is seen as a bounded region in space (*in*). There are other uses of *to* that add a recipient of the object in motion, as in *He threw the book to John*. Example (3a) is a prototypical case of a caused-motion construction in which the PP is the result logically entailed by the verb describing physical impact on the bag. The verbs *order*, *mock*, *ridicule*, and *kiss* do not have an intrinsic caused-motion sense, but they can be used figuratively with the caused-motion construction. Example (3b) is an example of a ‘manipulative subjective-transitive construction’ (cf. González García’s 2012 classification) whereas in (3c) psychological impact on a patient determines the patient’s resignation and through implication the physical separation from his former working institution. Sentence (3d) involves another figurative use of the caused-motion construction rendering a change in an emotional state, which is construed as a container. In our view, the integration of the verbs *order*, *mock*, *ridicule*, and *kiss* into the caused-motion construction is possible through the activity of the metaphor CHANGES OF STATE ARE CHANGES OF LOCATION, which allows us to see the result of any action as the natural result of caused-motion, i.e. reaching a destination.

Goldberg’s account alone does not supply any specification of why these verbs can be incorporated into the caused-motion construction, while others cannot: **The officers asked him out of the building*, **The media described him out of the ministry*, **The woman approached me into ecstasy*. In addition, Boas (2008b) has noted that

Goldberg's (1995) analysis is not detailed enough to predict the distribution of semantically related verbs between the resultative and the caused-motion constructions. For example, it is possible to say *He talked himself blue in the face* but not **He spoke himself blue in the face*. Boas (2003: 261) explains the (un)acceptability of such constructions in terms of conventionalization, i.e. the first resultative is grammatically correct because a speech community has agreed to associate this sentence with the meaning 'to overdo an activity'. We claim that the verb *talk* in the resultative construction evokes a primary scenario in which a person through excessive and rapid talking might hypothetically turn blue in the face. This hyperbolic situation maps onto a whole range of real life scenarios in which people overexert themselves when involved in certain activities. In the source scenario the prototypical activity is one of conversing, which is why the more generic verb *speak* is precluded from appearing in this resultative construction.

Moreover, Goldberg (1995: 165-174) claims that the caused-motion construction is characterized by the following properties:

- (i) It contributes an inherent caused-motion semantics that cannot plausibly be ascribed to the lexical verb itself.
- (ii) It supplies the caused-motion semantics that cannot be attributed to the preposition *to* or *into*.
- (iii) The causer argument can be either an agent (e.g. *John pushed the woman out of the window*), or a natural force (e.g. *Strong winds blew the roof off the flimsy hut*), but never an instrument (e.g. **The axe split the logs into smaller pieces*).

(iv) The direct object cannot be involved in any cognitive decision that can separate temporally the causing event from its entailed motion (cf. **John convinced/persuaded me into the room*).

(v) When motion is not a necessary consequence, it must at least be implied by the verb's satisfaction conditions (e.g. in example (3b), repeated here for convenience: *The officers ordered him out of the building*, future motion is entailed only if he obeys the officers's orders).

Before moving on to show the polysemic potential of the caused-motion construction, we would like to bring into our discussion Goldberg's (1995: 167) generalization that "no cognitive decision can mediate between the causing event and the entailed motion". Peña (2009) suggests that Goldberg's (1995) generalization should be reformulated to encompass all the possible instantiations of the caused-motion construction, not only the ones which involve literal motion as in (iv). Broadly speaking, no cognitive decision separates temporally the causing event and the resultant motion when the prepositional phrase codes literal location. The situation changes drastically whenever figurative locations come into play, since the caused-motion construction becomes perfectly compatible with verbs like *persuade*, *convince*, or *encourage*. In order to prove her theoretical assumptions, Peña (2009: 752-755) cites examples like the following: *His domineering father persuaded her into an unwanted career in the family business; In 2003, she claimed that Paulk had convinced her into a lengthy affair; She was soon noticed by the Governor of Kampala who encouraged her into mainstream politics*. All these examples are shown to abide by the principles of the high-level metaphor CAUSES ARE FORCES and of the high-level metonymy MEANS FOR ACTION and they also obey the logic of the low-level metaphor ABSTRACT

ENTITIES ARE CONTAINERS. Also, they are licensed by Ruiz de Mendoza's (2008) high-level metaphoric chain AN EFFECTUAL ACTION IS CAUSED MOTION+ACQUIRING A PROPERTY IS RECEIVING A MOVING OBJECT. The metaphor CAUSES ARE FORCES, which conceptualizes causation in terms of force dynamics, is one of the submappings of the more general EVENT STRUCTURE metaphor (Lakoff 1990, 1993).⁵³ The verb *persuade* in the first utterance conflates the action and the means as demonstrated by the paraphrase *His father acted in a way (i.e. through persuasion) that caused her to follow a given course of action*. Moreover, a PP like *into a lengthy affair* cues the activation of the metaphor ABSTRACT ENTITIES ARE CONTAINERS, which is in fact sister to the metaphor STATES ARE LOCATIONS. Nevertheless, ABSTRACT ENTITIES ARE CONTAINERS was not included by Lakoff (1990, 1993) among the metaphors that form the EVENT STRUCTURE cluster of metaphors. Lastly, the high-level metaphoric chain, which is an external constraint postulated by the LCM, allows the subsumption of predicates like *persuade*, *convince*, and *encourage* into the caused-motion construction. This external constraint will be discussed at length at a later stage of this work (section 2.3.2), where we will demonstrate how it felicitously applies to entity-specific change-of-state verbs.

Goldberg (1995) also contends that the caused-motion construction is polysemous in the sense that it has a central meaning, i.e. a successful caused-motion sense, and some other constructional subsenses as pictured in Figure 4.3:

⁵³ According to Lakoff (1990, 1993), this metaphor, which maps the source domain of space onto the abstract target domain of any event, comprises the following submappings: STATES ARE LOCATIONS, CHANGES ARE MOVEMENTS, PURPOSES ARE DESTINATIONS, and CAUSES ARE FORCES. However, each of these purported submappings is in fact an independent, self-standing metaphor. Consider the sentence *I am in a bad mood today*, which is based on the metaphor STATES ARE LOCATIONS. Please note that here this metaphor does not presuppose the existence of other metaphors, such as CHANGES OF STATES ARE CHANGES OF LOCATIONS or PURPOSES ARE DESTINATIONS.

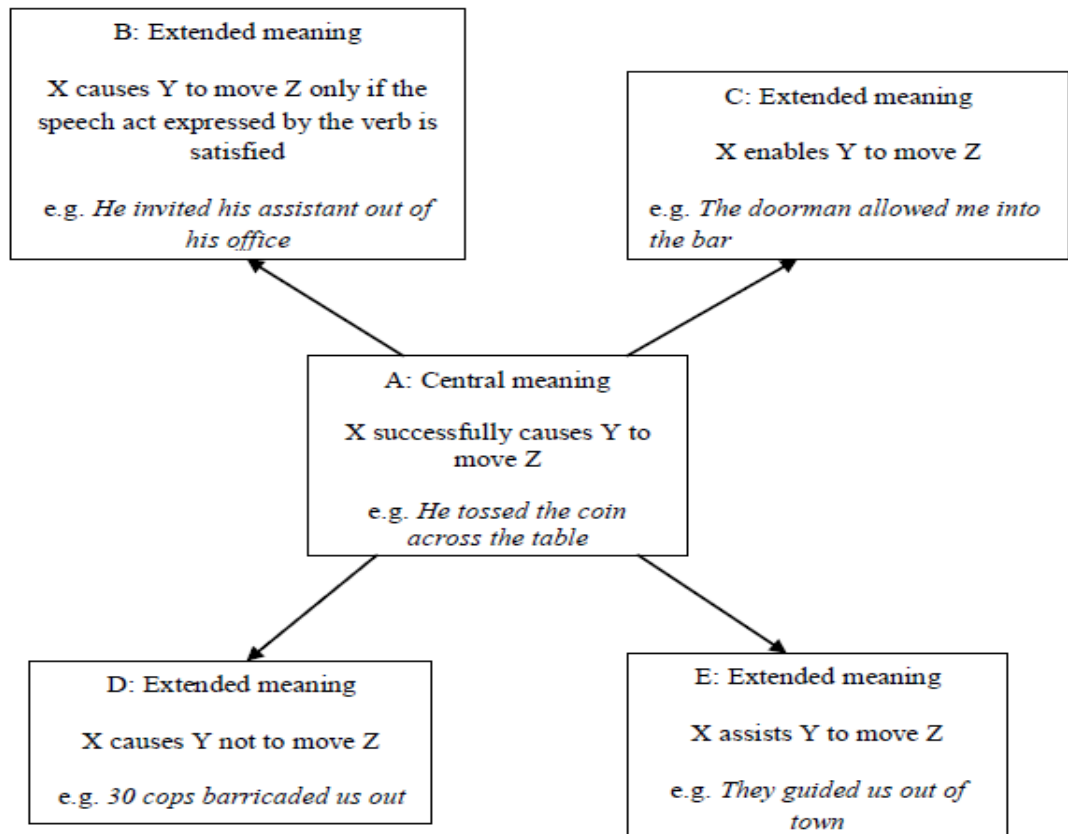


Figure 4.3 Polysemous senses of the caused-motion construction

Thus, on this view, motion can be: 1) implied by the verb's satisfaction conditions (*invite*, in *He invited his assistant out of his office*), 2) made possible (*allow*, in *The doorman allowed me into the bar*), 3) caused not to take place (*barricade*, in *30 cops barricaded us out*), and 4) assisted (*guide*, in *They guided us out of town*).

Regarding the close connection between the resultative and the caused-motion construction, Goldberg (1991a, 1995) has claimed that the former is a metaphorical extension of the latter in the sense that the resultative codes a metaphorical change of location. According to this author, the caused-motion construction is more basic than the resultative construction, since it arises from (what Grady would later label) primary conceptualization, i.e. concepts directly grounded in our experience (motion along a path). Nevertheless, Goldberg's position is hardly tenable in view of the fact that the

caused-motion construction is just one way among others of expressing result. This fact is reinforced by the figurative use of the caused-motion construction to codify a non-motional result (cf. *He talked me into business*): speakers do not use the resultative construction figuratively to express caused motion, so the general expression of result is more central than the expression of caused motion.

Another type of resultative construction that will be examined in this dissertation is what Goldberg (1995) calls the *intransitive motion construction* (e.g. *The bees buzzed into the garden*), later relabeled *intransitive path resultative* (cf. Goldberg & Jackendoff 2004). The skeletal meaning representation of this construction is X MOVES Y, where Y denotes the path of motion followed by X. Goldberg (1995) does not offer a detailed characterization of the intransitive motion construction but she stresses that it is connected to the caused-motion construction via a subpart inheritance link, according to which the former draws partial structure from the latter. No external cause determines the motion of the X element. Rosca (2012ab) concurs with Goldberg & Jackendoff's (2004) result relationship established between the constructional subevent and the verbal one for *sound emission* verbs. The verb *plop* in the sentence *The frog plopped into the pond* functions as the result of the constructional subevent, viz. the plopping sound is produced by the motion of the frog (cf. *The frog fell into the pond with a plop*). Also, the narrow selective power of this sound emission verb is accounted for in the LCM by the Internal Variable Conditioning constraint, which stipulates that the internal predicate variables place constraints on the nature of the constructional arguments. Thus, the verb *plop* describes the sound that is caused at the fall of a moving entity into the water. The link of this verb to the final part of the event (the fall) constrains the choice of the constructional subevent (cf. *The frog plopped into the pond/*from the grass/*through the air*).

The intransitive resultative construction is a fairly frequent type of configuration in our corpus with entity-specific change-of-state verbs. The difference between the resultative (X CAUSES Y TO BECOME Z) and the intransitive resultative (Y BECOMES Z) is marked by the presence of the X causal element in the first type of construction. In the intransitive resultative construction the result seems to be obtained by the undergoer itself. The entity-specific change-of-state verbs utilize either of two syntactic forms to convey an intransitive result: adjectival phrases (e.g. [...] *the crops rotted black in the ground*; Sketch engine doc#699247) or prepositional phrases (e.g. *Competition can deteriorate into rivalry*; Sketch engine doc#79524). A very peculiar way of codifying an intransitive result is exemplified by the sentence *Her cheeks bloomed with scarlet* (Sketch engine doc#123606). The preposition *with*, which more readily expresses a cause (e.g. *He died with pneumonia*), is used here to encode a result (cf. *Her cheeks grew in beauty and as a result, they became scarlet*), which is licensed by the conceptual conflation of effects and causes, which underlies the activity of the EFFECT FOR CAUSE metonymy. In consonance with other cases of conflation, as discussed above, folk knowledge based on misinterpreted perception may result in mixing up effects and causes. For example, we can observe a dead body covered with skin lesions and erroneously believe that the skin lesions have killed the person, which in fact are just a symptom of an underlying disease (a bacterial infection). In a similar vein, we consider that the intransitive resultative construction is but a constructional calque of the intransitive construction. The intransitive resultative construction is made possible by the high-level metonymy A CHANGE OF STATE FOR A CAUSED EVENT. Consider the sentence *The crops withered brown*. This linguistic expression designates a change of state, i.e. the crops becoming brown, but through world knowledge we understand that this change of state happens by the action of what

withers plants, namely certain weather conditions. That is why we have a latent caused event.

Lastly, another type of resultative configuration is the *way* construction, illustrated by the examples reproduced in (4) (a)-(c):

- (4) a. *Rasselas dug his way out of the Happy Valley.*
- b. *The wounded soldiers limped their way across the field.*
- c. *Sam joked his way into the meeting.*

The first two examples were extracted from Israel (1996: 218) whereas the third one is cited and analyzed in Goldberg (1996: 33). All of them entail the motion of the subject referent along the path encoded by the prepositional phrase. Example (4a) stresses the means of achieving motion, i.e. Rasselas moved out of a location through the creation of a path. In (4b) the verbal subevent elaborates the manner of achieving motion, whilst (4c) lends itself to both means and manner readings (e.g. *Sam got into the meeting by (means)/while (manner) joking*). For Goldberg (1996) the means reading is more central or basic, whilst the manner interpretation is considered to be an extension of the former. The reasons that Goldberg (1996: 35) provides for such claims can be summarized as follows: (i) the manner examples are more scarce than the means ones in the corpora under analysis, i.e. the Oxford University Press Corpus (OUP), the Lund Corpus, the United States Department of Agriculture corpus (USDA), and the *Wall Street Journal* 1989 corpus (WSJ); (ii) speakers judge means examples fully acceptable while manner examples are often considered unacceptable or marginal; and (iii) the means reading was attested several centuries earlier than the manner interpretation. Surprisingly enough, Israel's (1996) diachronic findings invalidate Goldberg's (1996) hypothesis, by

pointing out that the manner thread is attested from at least 1350 on whereas the means thread enters into usage at the end of the sixteenth century.

Goldberg (1995, 1996) skeletally represents the *way*-construction as follows: [SUBJ_i[V [POSS_iway] OBL]], where V is a non-stative verb, the OBL codes a directional and the lexical unit ‘way’ is a fixed or non-parametrizable element. Furthermore, the subject referent moves despite some external obstacles and the path followed by the subject is not pre-established, but is created by the action carried out by the subject. In the metaphorical expression *Sally drank her way through a case of vodka* the activity of drinking the case of vodka is construed as a metaphorical barrier that the subject has to overcome. In contrast to Goldberg’s (1996: 37) *way*-construction examples, which rule out basic motion verbs like *run* or *walk* (e.g. **She ran/walked her way to New York*), Luzondo (2011: 186-187) offers compelling evidence of the feasibility of these predicates appearing in this type of construction (e.g. *He’d run from so many things, he’d pretty much run his way to the end of his life*; COCA, 1996; *Ghandi walked his way across the country to win democracy*, cited by Kuno & Takami 2004: 67). Also, Luzondo’s (2011: 188-189) examples cast more doubt on the correctness of Goldberg’s (1995) hypothesis according to which in the *way*-construction a path is forcefully created through the removal of obstacles. The example *My fingers ran their way through her hair loving the feeling of it* (Luzondo 2011: 189) clearly indicates a lack of struggle reinforced by the pleasant feeling that the speaker experiences while moving his/her fingers along a person’s hair.

As signaled by Goldberg (1995: 212-214) the *way*-construction is subject to three main semantic constraints:

(i) The verb must designate a repeated action or unbounded activity (cf. also Jackendoff 1990; *Firing wildly, Jones shot his way through the crowd* vs. **With a single bullet, Jones shot his way through the crowd*). As noted above, the resultative construction obeys the same semantic constraint in the sense that it matches with verbs indicating a repeated action (cf. **The captain flogged the sailor to death with only one whip*).

(ii) Motion must be self-propelled as demonstrated by the ungrammaticality of the sentence **The wood burns its way to the ground*. Nevertheless, Goldberg (1996) does not provide any explanation for the unacceptability of such a sentence. The satellite⁵⁴ *to the ground* describes downward motion which is controlled by the gravitational force and not by the falling entity (a mere undergoer). Therefore, the subject referent cannot be said to create its own path since it follows the gravitational path and no obstacles seem to impede its fall. Examples describing downward motion would simply contradict Goldberg's (1995, 1996) previous semantic constraints of the *way* construction: (i) a path must be created (in the case of falling the path is already pre-established); (ii) motion occurs despite the existence of external obstacles. Thus, it seems that the *way* construction can accept vertical motion –cf. Jackendoff's (1990: 212) example *The barrel rolled its way up the alley*– and horizontal motion, just like its sister construction, caused-motion, thus combining with different motion-denoting prepositions: *out of, into, through*, etc. (iii) Motion must also be directed, i.e. it cannot be aimless motion (e.g. **She meandered her way through the crowds*).

⁵⁴ This term was first used by Dik (1989) and later reintroduced by Talmy (1991, 2000) in connection with the division of world's languages into two main categories: verb-framed and satellite-framed languages. Being a satellite-framed language, English maps the core information of a sentence onto the satellite (an adverbial) while the verb encodes the additional information.

Before embarking upon the analysis of entity-specific change-of-state verbs, a clear distinction should be made within the resultative construction between two change schemas. Ruiz de Mendoza & Luzondo (2011) put forward the general principle of *Resultatives under one common denominator*, which explains the chaotic realization of end-results by means of two simple change schemas, i.e. A>A' and A>B schemas. The first illustrates that an entity A acquires a new property but retains its essence, whereas the second indicates that an entity A experiences a conspicuous change which leads to a loss of homogeneity or integrity. For example, a sentence like *Mary wiped the table clean* falls into the first change schema (A>A') because the patient (table) undergoes a transformation of only one of its properties (e.g. from being dirty to being clean). The A>B change schema is employed in the sentence *The witch turned the boy into a frog*, where the result-state *into a frog* indicates that the patient (the boy) has suffered a total transformation, reaching a completely different state (i.e. from a human being to an animate entity).

Having gone through the more theoretical aspects of the constructions under scrutiny, in the next section we will concentrate on how entity-specific change-of-state verbs interact with these constructs and the principles that regulate their subsumption processes. In order to do so, we will make use of the analytical tools provided by the LCM, showing that this model improves on both Goldberg's and Boas's approaches by integrating metaphorical and metonymic mechanisms into its powerful explanatory framework.

4.2. Verbs of entity-specific change-of-state

Levin's (1993: 246) list of entity-specific change-of-state verbs comprises twenty-one verbs which we have grouped into three main categories on the basis of their conceptual similarity and the change schema they encode:⁵⁵

- (1) Verbs that are subsumed under the A>A' schema, which describe an increase in size (e.g. *bloom, blossom, flower, germinate, sprout, swell, blister*).
- (2) Verbs that are subsumed under the A>B schema which describe a negative, destructive change affecting the integrity of an entity (e.g. *burn, corrode, decay, deteriorate, erode, molder, molt, rot, rust, stagnate, tarnish, wilt, wither*).⁵⁶
- (3) The verb *ferment* follows the A>A' schema but it is different from the first two categories in the sense that there is no increase in size and the change is not necessarily negative nor does it lead to the disappearance of the entity.

The verbs in the first group depict the coming to life/existence of an entity out of a pre-existent one. Thus, when a flower blooms/blossoms/flowers, the plant develops a protuberance (bud/blossom) outside the stem (the plant switches from a vegetative state to a reproductive stage). Although this process is generally viewed as a positive change, there might be some exceptions as can be seen in the sentences *The Gorby-period meant lack of products of all kind and corruption bloomed in the worst possible way* (Sketch enginedoc#1796738), *Cysts germinate in the gastrointestinal tract and bring about the symptoms of giardiasis* (Sketch engine doc#254041), or *In Jamie's case, the tumor blossomed in a small cavity above the sinus and at the base of her skull*(Sketch engine

⁵⁵ Mention should be made of the fact that prepositional phrase resultatives can be encoded by the A>B as well as the A>A' change schemas (section 4.2.2). Likewise, adjectival phrase resultatives can exploit both the A>B and the A>A' change schemas (see section 4.2.3).

⁵⁶ Levin (1993) mistakenly includes the verb *stagnate* among entity-specific change-of-state verbs. However, this verb does not evoke any change schema since its meaning encodes cessation of motion or progress.

doc#758951). Also, the verb *blister*, which refers to the causation of a swelling of the skin containing a watery fluid, can be regarded as a negative change of state but does not threaten the “essence” of the experiencer. The verbs *bloom*, *blossom*, *flower* can be exploited in a figurative way to refer to someone's healthy, happy or successful appearance probably because we associate a person's glowing physical aspect with the positive emotions that the sight and color of a blossoming flower transmit to us. It is also common knowledge that the flowering process constitutes the maximum development of a plant and this stage can be reached only if the plant stays healthy. The sentence *The child blossomed into a good looking young man who caught the heart of many a girl [...]* (Sketch engine doc#638230) is grounded in the low-level metaphor REACHING ONE'S PRIME IS FLOWERING whereby physical development of human beings is conceptualized in terms of a plant reaching the blooming stage. This metaphor is subsidiary to a more generic one, i.e. HUMANS ARE PLANTS, which in its turn is but a natural extension of the Great Chain of Being metaphor (cf. Lakoff & Turner 1989), which attempts to comprehend human attributes and behavior through characteristics of animals, plants, natural objects and artifacts. The life cycle or (physical/professional) development is regarded as motion forth, e.g. people go from youth to old age, from a state of poverty to one of welfare just like a bud spreads out of the plant to the surface in the sunlight (cf. the old Lakoffian metaphor PROGRESS IS MOTION).

With respect to *germinate* and *sprout*, these two verbs are similar since they make reference to the initial state of growth of a seed, thus suggesting the beginning of progress. In the figurative domain, the appearance of shoots/buds/leaves on a plant is correlated with the development of an idea/project/belief or the construction of buildings in a place (e.g. *Skyscrapers are sprouting up all over Europe*). There is also

an interesting implication about these verbs: since early shoots or buds are usually a sign that there are prospects for a full-blown plant to emerge at some point in time, they are a sign of hope (i.e. the prospects of a future fully fruit-bearing mature plant map onto the future prospects for maturity of ideas, plans, etc., which are now at their initial stages). Both *blister* and *swell* indicate a size or volume increase either of a body part (e.g. *My feet and legs swell when I stand for too long a period*; Sketch engine doc#8227) or of other kinds of surface (a blister can also mean a raised bubble on a painted or laminated surface).

The verbs in the second group are all a subclass of change-of-state verbs, which can be used inchoatively (e.g. *He broke the window/The window broke, He burned the house/The house burned, Time corroded the metal/The metal corroded*). That is, they inherit this syntactic property from the change-of-state class. However, they may differ from other change-of-state verbs in other forms of constructional behavior. Contrast the sentence *The vase broke into pieces* with *The acid burned into the metal*. The verbs *break* and *burn* share the same constructional form (S V *into* NP) but they yield different semantic interpretations: the first sentence is an intransitive resultative construction (the fragmentation of the vase into pieces is the result of the vase breaking), while the second example is an intransitive motion construction (non-resultative: the metal is an affected entity rather than the result of the action described by the verb). All the verbs in the second group involve a total transformation of an entity which suffers a gradual/sudden disintegration. For instance, a plant that withers undergoes a size decrease and starts to die. In the case of *erode* the surface of soil or a rock gradually disappears. The verbs *corrode*, *tarnish*, and *rust* are conceptually related, since they refer to changes undergone by metals (the verb *tarnish* is more specific because the metals affected can only be silver, copper or brass). *Tarnish* and *rust*

highlight either a loss of color or the acquisition of a reddish-brown color by oxidation, whilst *corrode* specifically points to the process of destruction of a metal. So the first group of verbs (*bloom, sprout, etc.*) and the second occupy diametrically opposed positions, i.e. the former highlights a spatial/abstract expansion of an entity, whereas the latter depicts a spatial/abstract reduction or disintegration of that entity. Lastly, the verb *ferment* pinpoints an A>A' type of change in which a substance acquires new properties (e.g. when wine ferments into vinegar it undergoes different changes: color/taste/smell, but it retains its essence, i.e. it is still a liquid). However, the process described by the verb *ferment* is not necessarily a negative, destructive change as is the case with *decay* or *corrode*.

4.2.1. Verbs of the first group in FrameNet

We initially turned to FrameNet (Fillmore *et al.* 2003; Atkins *et al.* 2003) to examine its approach to the verbs under consideration but unfortunately the verbs *bloom, blossom, flower, germinate, sprout, and blister* returned no hits. From the verbs listed in the first category *swell* is the only one that displays four semantic frames: 'expansion', 'change of position on a scale', 'causation of expansion' and 'causation of change of position on a scale'. The first two frames were designed to account for intransitive sentences whereas the last two supposedly motivate the use of this verb in causative constructions. As stated by Ruppenhofer *et al.* (2010: 5) FrameNet aims "to document the range of semantic and syntactic combinatory possibilities- *valences*-of each word in each of its senses" (emphasis in the original). Any *lexical unit* (LU; a term borrowed from Cruse 1986), i.e. a pairing of a lexical form and meaning, can evoke one or more semantic frames, which are defined as script-like conceptual structures

describing a given situation, object, or event together with its participants or Frame Elements (FEs) and particular role specifications.⁵⁷ FrameNet divides FEs into core, peripheral, and extra-thematic. The first are conceptually necessary components of a cognitive scenario which provide uniqueness to a frame. The second are frame elements that do not refer to additional, independent or distinct events from the main reported event. The third serve the purpose of situating the main reported event against a backdrop of another state of affairs of the same type or belonging to a larger frame. Thus, the expansion frame of the verb *swell*, which refers to an entity becoming larger or rounder in size due to an accumulation of fluid, features only one core FE and twelve non-core FEs, either peripheral or extra-thematic. The *Item* represents the core participant role which undergoes a change in size (e.g. *Feel how your abdomen swells and falls*; Sketch enginedoc#1206) whilst the non-core ones are as follows:⁵⁸

- (i) The *Co-variable*, which is the quantity that varies commensurately with the size of the Item (e.g. *My eye pained and swelled with each throb of my pounding heart and I wondered if now I would be allowed to speak*; Sketch engine doc#818950, where an increasing heart rate correlates with the amount of swelling);
- (ii) The *Degree* to which the expansion process occurs (e.g. *Sprinkle with the gelatin and leave it [mixture] for 5 minutes for it to swell completely*; Sketch enginedoc#30805);

⁵⁷ Unlike the LCM, which follows Dik's (1997) threefold distinction for the functions of a word (i.e. semantic, syntactic, and pragmatic), FrameNet identifies only two functions: the semantic one, which is characterized by frame elements, and the grammatical one (e.g. the subject, the object, and the complement expressed by means of phrase types, such as NPs, PPs, APs, etc.). Frame elements are specifications of the more abstract thematic roles of agent, patient, and theme. For example, the Buyer is an agent in the 'commerce' frame.

⁵⁸ At this point it should be noted that we will illustrate the 'expansion' frame for the verb *swell* with examples extracted from our own corpus since FrameNet provides no examples for this verb in this particular frame.

(iii) The *Dimension* (e.g. [...] *the cortex of individuals with preclinical Huntington's disease swells in size [...]*; Sketch engine doc#210592);

(iv) The temporal *Duration* that the expansion process takes (e.g. *The researchers are also developing a leg socket that can adjust to the changing diameter of the amputated stump as it swells over the course of the day [...]*; Sketch engine doc#134250);

(v) The *Group* in which an Item undergoes the change in size (e.g. [...] *the process of release of oocytes from the ovary is by means of a blister-like fluid swelling among follicle cells adjacent to each oocyte*; Sketch engine doc#1634393);

(vi) The *Initial_size*, which is often accompanied by the (vii) *Result_size* (e.g. *I can cope with a ridiculously foreshortened parasitic lifecycle, but the sight of creatures swelling from miniscule to twice the size of a human shows that the creators of this film have no idea of conservation of mass*; Sketch engine doc#1193635);

(viii) The *Manner* of the expansion (e.g. *The material that clothes her swells softly with the breath of the fluid that shapes it*; Sketch engine doc#960316);

(ix) The *Path* indicating a point on the scale of size (e.g. *Simultaneously, it causes the slug's antennae to swell up and glow phosphorescently*; Sketch engine doc#37978);

(x) The *Rate* at which the expansion takes place (e.g. [...] *the mountain was swelling about five feet a day in a northward, lowering direction*; Sketch engine doc#917263);

(xi) The *Size_change* (e.g. [...] *my chest measure had swelled an inch or so* [...]); Sketch engine doc#268431);

(xii) and the *Time* when the expansion happens (e.g. *It's likely going to swell on him tomorrow* [...]); Sketch engine doc#1681066).

Examples compiled from a bigger corpus than the one employed by the FrameNet lexicographers (i.e. The British National Corpus) demonstrate that a verb has a richer distributional pattern and consequently, more frame elements can be added. Thus, we can complete this frame proposal by contemplating Frame Elements, such as:

(xiii) The *Location/Place* where this expansion occurs (e.g. *The anger-vein swelled in his forehead as he spoke*; Sketch engine doc#166046);

(xiv) The *External_cause* of the expansion (e.g. *The police, [...] kept the body on display for 48 hours as it swelled in the heat* [...]); Sketch engine doc#671097);

(xv) The *Internal_cause* (e.g. *And the mother's heart swelled big with anguish*; Sketch engine doc#1167890);

(xvi) The *Subregion* (e.g. *Within 24 hours, the female's back begins to swell around the eggs*; Sketch engine doc#745610);

(xvii) and the *Source* of this process (e.g. *His tongue had swelled out of his head*; Sketch engine doc#2347336).

As will be seen later on, FrameNet has included the cause within the 'causation of expansion' frame. Nevertheless, if we look at the lexicographical definition of the verb *swell* we notice that the increase in size does not occur naturally but as a result of internal pressure. By taking this observation into consideration can we really claim the

existence of two separate semantic frames for this verb? At this stage it is important to examine the reasons why FrameNet has decided to separate the causative and the inchoative uses of a verb into two different frames. Ruppenhofer *et al.* (2010: 12) enumerate two main factors motivating this lexicographical decision:

There may be a legitimate objection about the presence of an AGENT or CAUSE being just a vague linguistic intuition and that we ignore the fact that everything that happens is caused [...] First, there will typically be lexical units that exhibit only one of the two uses. For instance, the verb *gain* only has inchoative uses when referring to scalar change, while the verb *lower* only allows causative uses in the domain of scalar change. Second, cross-linguistic comparison also shows that other languages often distinguish inchoatives and causatives by derivational morphology.

The LCM disagrees with the separation of these two frames since the central meaning of the verb *swell* is ‘to increase in size or volume’, whether we take the causative or the inchoative perspective: *The heat swelled my feet* (‘caused the feet to become bigger’) or *My feet swelled* (‘the feet became bigger’). Causative and inchoative uses of a verb are a matter of the perspective from which we see an event. The frame itself is not affected by perspective. What is more, the perspective is imposed *ad hoc* when the frame is put to use. The causative/inchoative distinction is, thus, a matter of perspective on frames and it should not interfere with the structure of events proposed by frames.

Another significant problem is posed by the incorporation of the Path element in the ‘expansion’ frame. How does FrameNet motivate the conceptual link between the increase in physical size and spatiality without acknowledging the existence of primary metaphors? Lakoff & Johnson’s (1980) orientational metaphor MORE IS UP licenses the combination of the verb *swell* with the preposition *up*, since there is an experiential basis according to which if you add more of a substance or of objects to a container or a pile, the level will go up. In relation to the MORE IS UP metaphor, Taylor (1995: 138) argues that height is literally correlated with quantity and the natural association

between quantity and vertical extent has a metonymic basis. This metonymy becomes a metaphor only when more abstract instances of addition are evoked, such as *high prices*. Later on, Radden (2002: 410) takes up this issue and postulates a continuum ranging from literalness via metonymy to metaphor. This notion is tightly connected to the developmental model of primary scenes and primary metaphors and the notion of *deconflation* proposed by Grady (1997) and Grady & Johnson (2002). Radden (2002: 410-412) claims that MORE IS UP is a metonymy-based metaphor which has undergone four stages of evolution: (1) a literal stage in which the concept of verticality is experienced alone; (2) a stage of conflation (UP+MORE) or partial metonymy which emerges from a primary scene in which we see the level of liquid in a container go up when more liquid is poured into it; (3) a stage of deconflation or full metonymy (UP FOR MORE) in which the two concepts start separating; and (4) the final stage or the metaphoric MORE IS UP.

Ruiz de Mendoza (2011) discusses the cognitive operation of integration by *enrichment* whereby the FULL-EMPTY schema is enriched by the implicit VERTICALITY schema underlying the figurative quantity-height correlation. Furthermore, Peña (2003, 2008) claims that the VERTICALITY schema is inherently subsidiary to FULL-EMPTY and demonstrates how the CONTAINER and the PATH schemas blend to give rise to an intransitive resultative construction, e.g. *She was led into a depression*. In this example the subject moves to a resultant state of depression which is understood as a location and the container schema appears in the end-of-path structural slot. The verb *swell* could describe the expansion of an entity on a vertical and also on a horizontal level. The utterance *Tomatoes need a good supply of water when the fruits are swelling up* (Sketch engine doc#54055) makes use of the aforementioned combination between the FULL-EMPTY and the VERTICALITY schemas, whereas in

the sentence *The buds of millions of poppy flowers are swelling across Afghanistan* (Sketch engine doc#1363530) the expansion frame is enriched by the SURFACE schema, which is later enriched with the subsidiary motion and path schemas. Thus, there are two primary metaphors at work here, namely SWELLING IS UPWARDS AND/OR FORWARD MOTION. Also note that owing to these metaphors sentences like **My foot swelled down* or **The injury swelled back* are impossible. This is so because swelling is accompanied by an increase in height. This obeys the experientially based correlation between quantity and height mentioned above to such an extent that the mind interprets both types of increase as if they were the same. Grady (1997, 1999) has shown that conflation is also present in other domains of our daily embodied experience, leading to the creation of primary metaphors, such as INTIMACY IS CLOSENESS (e.g. *They are close friends*), AFFECTION IS WARMTH (e.g. *She gave me a warm embrace*), IMPORTANT IS BIG (e.g. *Tomorrow is a big day for my career*), CHANGE IS MOTION (e.g. *My car has gone from bad to worse*), and UNDERSTANDING IS GRASPING (e.g. *She grasped his theory*), to name just a few.

Taylor's (1995: 139) examples of synesthesia, which is a subcategory of metaphor, can also be understood in terms of conflation. Synesthesia results from mapping one sensory domain onto another. Among the most representative examples we list *loud color* (which maps a feature of the auditory domain onto the visual domain), *black mood* (color is mapped onto an emotional state), and *sweet music* (where a gustatory sensation is linked to the auditory domain). Osgood *et al.* (1957) have investigated perceived similarity across different domains and put forward the existence of an 'affective reaction system' which is independent of any sensory modality. The affective reaction system was believed to have three primary dimensions: evaluation,

potency, and activity. Identical reactions on these dimensions to stimuli from our environment are what could give rise to metaphor and synesthesia.

Additionally, there is a growing body of empirical studies that support the existence of conflation in primary metaphors. For example, consider the well-known pair of metaphors GOOD IS UP/BAD IS DOWN. Meier, Robinson & Clore's (2004) experiment demonstrates that people recognize positive words faster if these are placed on a higher vertical position on a computer screen and subsequently find negative words faster if they are positioned in the lower part of the screen. These results are in concordance with the idea that people conceptualize abstract notions such as good and bad as being located on a vertical scale, because good experiences are upward (e.g. being alive and healthy implies an upright position) and bad experiences are downward (e.g. sickness and death). Williams & Bargh (2008) explored the correlation between affection and warmth in a study in which people who briefly held warm, as opposed to cold, cups of coffee judged a fictitious person's interpersonal traits as being warmer. Finally, studies using an online lexical priming task revealed that people access conceptual metaphors (e.g. ANGER IS HEATED FLUID IN A CONTAINER) to process idiomatic sentences like *John blew his stack* (cf. Gibbs, Bogdanovich, Sykes & Barr 1997).

The 'causation of expansion' frame comprises three core FEs and fifteen peripheral or optional FEs. The first group is made up of a human Agent who causes the change in size (e.g. He *swelled himself up to near double his size*; Sketch engine doc#511390), the Item which undergoes the change and the Cause which is an inanimate entity bringing about the change (e.g. High rainfall *had swollen the waters draining off the reclaimed lands in the River Yar*; Sketch engine doc#22016). The non-

core FEs are the following: the Co_Variable, the Dimension, the Elapsed time, the Group in which the Item changes, the Initial_size and the Result-size, the Rate of change, the Place where the Agent causes the expansion, the Manner, the Means, the Size_change, and the Time. In addition, three new components are added to this frame, that is to say, the Instrument with which the Agent causes the expansion of the Item, the Purpose, and the Reason for which the Agent causes the expansion. What FrameNet seems to overlook is the fact that the cause of the swelling may not always be expressed as the subject of a causative construction, as can be observed in *The waters were swelled* with continual rains, *and the low-lands were almost inundated* (Sketch engine doc#41368), where the cause is lexically realized by the preposition *with*. FrameNet shows how these FEs are realized at the grammatical level by including attested examples from the BNC. For the sake of illustration, let us consider the following FrameNet annotations for the ‘causation of expansion’ frame:

- (5) a. This amount was further SWELLED by a generous donation from Norfolk of £200.

(The Item or the undergoer of expansion is lexicalized by the NP *amount* and the *by* headed NP represents the Means by which the expansion is carried out).

- b. Pity they couldn't actually have joined us because I was last there on a Monday night and my four friends and I SWELLED the numbers beyond double figures.

(*My four friends and I* is the Subject NP and functions as the Agent causing the expansion and the NP *numbers* is the entity that increased in size).

- c. The heat SWELLS the metal, so breaking the rusted joint.

(The NP *heat* is the non-animate Cause of the expansion process whilst the Item is expressed by the NP *metal*).

Examples (5) (a)-(c) constitute the most typical combinatory affordances for the verb *swell*.⁵⁹ However, we stumble across the same problem as advanced earlier, i.e. what makes the English speaker's mind establish a link between a literal expansion of the surface of the metal with an abstract swelling of an amount/number? Moreover, we consider that examples (5a) and (5b) evoke a scalar dimension (i.e. the height scale) through activation of the primary metaphor MORE IS UP which connects an increase in number/amount to an increase in height. The vertical scale thus becomes subsidiary to the concept of quantity and is cued by metaphorical instantiations. On the other hand, physical size does not necessarily involve a scale unless you measure it.

The 'change of position on a scale' frame encompasses eight core FEs and sixteen non-core FEs. The conceptually necessary components are:

- (i) The Attribute or the scalar property of the Item (e.g. *Presently, as the voices swelled in volume, the baritone stepped forward*; Sketch engine doc#271446);⁶⁰
- (ii) The Difference (e.g. *About 1.3m Americans fell into poverty last year, while the total without medical insurance swelled by 1.4m, [...]*; Sketch engine doc#43613);
- (iii) The Initial_value and Final_value (e.g. *Taken together, the number of tourists world-wide is forecast to swell from 673 million this year to 1,602 million in 2020*; Sketch engine doc#36209);⁶¹

⁵⁹ The reader should not confuse the term typical with prototypical. The former signals frequency of occurrence of specific items or tokens. The latter derives from psycholinguistic work on goodness of ratings by experimental subjects. A prototype is the best example of a category. Prototypicality usually correlates with frequency of use (cf. Stubbs 2004), but not necessarily so. This means that a highly typical realization can be a prototypical one. Even though Fillmore *et al.* do not calculate frequency of occurrence (cf. Ruppenhofer *et al.* 2010: 22), they claim that they discard occurrences that are marginal, i.e. those for which they have obtained very few hits.

⁶⁰ In this example the voice is the Item, i.e. the entity undergoing a change of position on a scale.

(iv) and the Value_range, which is a portion of the scale along which the value of the attribute fluctuates (e.g. *The exchange rate has fluctuated* between a low point of US\$82 and a high point of US\$145 *per 100 euro*; Sketch engine doc#10239)⁶².

Among the peripheral FEs we should mention:

(i) The Circumstances (e.g. *One phenotypic expression of this inherited abnormality of Rbc in Beagles was an accelerated rate of RBC swelling* under osmotic stress [...]; Sketch engine doc#1386973);

(ii) The Correlate which is a directional path against which the Attribute is measured (e.g. *After 1985, these networks swelled* with another outflow of migrants [...]; Sketch engine doc#790797);

(iii) The Duration (e.g. *The ranks of the disabled have swelled* over the last two decades; Sketch engine doc#640149);

(iv) The Initial_correlate and Final_correlate (e.g. *The Gangsters swelled* from Ashland and Halsted *on the west* to Cottage Grove *on the east*; Sketch engine doc#207148);

(v) The Group (e.g.[...] *an inane debate swelled* among active gays *over a novel nomenclature* [...]; Sketch engine doc#55600);

⁶¹ No examples for the Initial_state and the Final_state were found in our corpus. These two FEs differ from the Initial_value and Final_value in that they express an Item's state after or before the change in the Attribute's value, as an independent predication. Also, FrameNet uses the verb *increase*, not *swell*, to exemplify the Initial_state and the Final_state (e.g. *Diesels have increased* from having a 20% market share in 1995 *to just over 30% in 2004*; *It was never bad (1 or 2 seizures a year), but this past decade, it has increased* to having them 1 day a month [...]).

⁶² The Value_range frame element could not have been exemplified with the verb *swell* whose unidirectionality is incompatible with oscillation between two points on a scale.

(vi) The Speed (e.g. *Estimates range from 150,000 to 350,000, swelling by 5 to 10 percent a month*; Sketch engine doc#755520);

(vii) The Path that the Item traverses (e.g. *A fast release could cause the sound to swell up in volume very quickly*; Sketch engine doc#166538).⁶³

Finally, the causative variant of the ‘change of position on a scale’ frame adds the human Agent (e.g. *Kurdish and Afghan refugees have swelled the ranks of the minority Sunnis [...]*; Sketch engine doc#52924) and the Cause (e.g. *[...] military campaigns have only swelled the ranks of his followers*; Sketch engine doc#109320). As for the non-core FEs, these are: the Co_Variable, which is the scale that the dependent Variable is measured against, the Difference, the Manner (e.g. *But Ireland and India greatly swelled the revenues available to Britain’s ruling class*; Sketch engine doc#256596), the Means, the Place, the Path, the Purpose, the Time, the Value_1 and Value_2, and the Speed. FrameNet lists only one example for this ‘causation of change of position on a scale’ frame, e.g. *Useful contributions from the tail SWELLED the score to 451, leaving India a distant victory target of 372*. In this sentence the *score* is the undergoer that changes its position to a final value due to *contributions* (cause).

4.2.2. Verbs of the first group and their constructional behavior

Levin’s (1993) seminal work provides an incomplete distributional range for these verbs, by focusing solely on their (non)-participation in the causative/inchoative alternation. Levin & Rappaport (1995) distinguish between *internally caused change-*

⁶³ Eight peripheral FEs were left out from this ‘change of position on a scale’ frame, i.e. the Containing_event, the Degree, the Manner, the Particular_iteration, the Period_of_iterations, the Place, the Result, and the Time. These were not illustrated here owing to the fact that no examples were found in our corpus. Nevertheless, FrameNet lists no examples for this frame.

of-state verbs, which include members such as *break*, *cool*, and *freeze*, and *externally caused change-of-state* verbs like *bloom*, *blossom*, *decay*, *erode*, etc. This criterion predicts that intransitive verbs describing an internally caused eventuality will reject the causative construction because it is believed that “some property inherent to the argument of the verb is responsible for bringing about the eventuality” (Levin & Rappaport 1995: 91). In contrast, externally caused verbs, which “imply the existence of an *external cause* with immediate control over bringing about the eventuality described by the verb: an agent, an instrument, a natural force, or a circumstance” (Levin & Rappaport 1995: 92), will readily select a causative construction. Therefore, the verb *bloom*, which describes a process inherent to an entity that undergoes the change, would not be allowed in the causative construction. Nevertheless, our data survey shows two cases of *bloom* being employed transitively:

- (6) a. [...] *in winter they succeed remarkably well in blooming their plants, owing to the extreme heat kept up in their houses by means of the stoves in use in this country* (Sketch engine doc#554587)
- b. *If you can successfully grow and bloom African violets, you will not have trouble growing and blooming Phalaenopsis* (Sketch engine doc#1109536)

The verb *bloom* is transitivized in these two sentences by means of the metonymy A CAUSED EVENT FOR THE CREATION OF CONDITIONS ENABLING A PROCESS. The blooming process is instigated or facilitated by the extreme heat applied to a plant which accelerates the natural course of events.

Wright (2002) argues that three main semantic and pragmatic factors combine together to determine the distribution of internally caused change-of-state verbs in transitive constructions, namely the causer type (whether the event is brought about by

humans or not), controllability (the degree to which an event can be externally manipulated), and subject-modification (whether the causer is in a modified or unmodified form). This author claims that externally caused change-of-state verbs observe well the properties associated with prototypical transitive events, viz. they involve a human causer who deliberately carries out an action that causes a change of state (see also Lakoff 1977; Hopper & Thompson 1980; DeLancey 1984, 1985, 1987; and Croft 1991, for further discussion on the notion of transitivity). Alternatively, internally caused change-of-state events describe nature-driven events that cause a change of state in some biological entity (e.g. *Drought wilted Illinois crops*; Sketch engine doc#498295). Also, in the case of internally caused change-of-state verbs the causer type is inherent to the meaning of the verbs so it is redundant to overtly specify it (cf. *?Last July, sunlight wilted the begonias/?This past summer, moisture rotted the tomatoes*, Wright 2002: 345). However, highlighting the causer type by modification makes transitive sentences perfectly acceptable, since it is understood that the causer is mentioned to emphasize its role in the event (e.g. *Last July, the intense sunlight wilted the begonias/This past summer, extremely moist conditions rotted the tomatoes*, Wright 2002: 345).⁶⁴ Also, the fusion between internally caused change-of-state verbs and the intransitive construction (e.g. *Flowers bloomed*) observes the Full Matching internal constraint since the verbal and the constructional subevents match perfectly, i.e. both describe an action which is both brought about and undergone by the subject.

In what follows, we aim to offer a fine-nuanced critical account of Levin's (1993) taxonomic work which elaborates rather vague semantic generalizations for verbs on the basis of their similarity in syntactic pattern. Levin's (1993) classification has been

⁶⁴ Also note that transitive sentences become acceptable when the causer is not the default one, as in the example mentioned earlier *Drought wilted Illinois crops* (the default causer for the verb *wilt* is heat).

virulently criticized for cross-listing verbs in classes which choose only one aspect of their overall meaning (cf. Baker & Ruppenhofer 2002) and for not being “as homogeneous as previously thought” (Boas 2011b: 207). These two observations can be applied to our group of verbs, since Levin seems to disregard figurative uses of these verbs which do license them in causative constructions. What is more, entity-specific change-of-state verbs display a much richer variety of valence patterns than has been claimed in Levin (1993) or elsewhere. In order to exemplify the puzzling acceptability differences among verbs of the first group, we have gathered and summarized the results of their complementation patterns in Table 4.1 below:

First group verbs	Intr. loc/temp	Intr. resultative	Intr. Causal	Causative	Way constr	Intr. motion	CM constr	Resultative
Bloom	X-both	X	X-with	X	X	X		
Blossom	X-both	X	X-in/with	X	X			X
Flower	X-both	X	X-with	X				
Germinate	X-both	X	X-with	X				
Sprout	X-both	X		X	X	X	X	
Swell	X-both	X	X-in/with	X	X			X
Blister	X	X	X-in/with	X	X		X	

Table 4.1 The syntactic distribution of first group verbs

The organization of constructional behavior in Table 4.1 follows the criterion of prototypicality. On the leftmost part of the table we have agglutinated the most prototypical or frequent constructions that the verbs in the first group more readily select. On the rightmost part of the table it can be observed that verbs start to show an uneven syntactic distribution, due to the slight differences in their conceptual makeup.

We shall start off by considering the most frequent syntactic patterns that these verbs participate in, namely the intransitive locative and the intransitive temporal

constructions. These two are the most common type of constructions probably because these verbs encode natural processes which are bound to happen in a specific type of environment and the exact timing of the process is a matter of great concern for gardeners, biologists, etc. All the first group verbs appear in the intransitive locative construction which indicates the place where an event is taking place. Let us take a look at some illustrative examples:

- (7) a. [...] *the cherry trees bloomed* in the royal gardens in Kyoto (Sketch engine doc#31152)
- b. [...] *unknown flowers blossom* in the gardens (Sketch engine doc#573237)
- c. *A few forget-me-nots flowered* by the water (Sketch engine doc#721790)
- d. [...] *verbenas flowered* at the sills of the unglazed windows (Sketch engine doc#2306454)
- e. *During cool, wet weather the spores germinate* on the young leaves *and initiate infection* (Sketch engine doc#458020)
- f. *New shoots should sprout* around the severed trunks (Sketch engine doc#719553)
- g. *Tanith's copper cupola swelled* among the palm trees (Sketch engine doc#383916)
- h. *Paint blistered* on the wall *where the kettle always steamed* (Sketch engine doc#276882)

Examples reproduced in (7) (a)-(h) evidence that location of an ongoing process can be lexicalized by different prepositions such as *in*, *by*, *at*, *on*, *around*, or *among*. The last two sentences differ conceptually from the first six ones, which refer to natural processes undergone by plants. The verb *swell* is more generic than *blister* and can be extrapolated to the domain of plants as in the intransitive resultative construction *Underground the stems swell into white bulbs connected by a mass of fibrous rootlets*. (Sketch engine doc#154649), where the development of a plant is conceptualized in terms of the primary metaphor CHANGE IS MOTION. As mentioned earlier, the range of semantic meanings of the verb *blister* is very narrow: damage either on the human skin or on a painted/laminated surface. The preposition *in* was shown to change its interpretation according to a given combination between a particular *trajector* (TR) and a particular *landmark* (LM) (cf. Evans & Tyler 2004: 248). Contrast the interpretation of the preposition *in* in the expression *the seed in the pot* with the one generated by the phrase *The crack in the pot*. In the first one the LM, the pot, is the container which surrounds the TR, the seed. In the second one the crack is a subpart of the interior or exterior of the LM, the pot. Our own examples (i.e. (7a) and (7b)) lend themselves to the first interpretation, adding the idea that a garden is an enclosed space and not a container. Linguists have studied the prepositions *in* and *on* in contrast with *into* and *onto*, assuming that they can have both a locative and a directional meaning (Inagaki 2002; Rooryck 1996; Thomas 2004).⁶⁵ Nevertheless, the directional reading of *in* and

⁶⁵ Thomas (2004) points out that the distribution of *in* and *on* in directional expressions is not as free as Rooryck (1996) and Inagaki (2002) have suggested. Such distribution is regulated by three main factors: the verb type, the adjacency of the verb and the PP (prepositional phrase), and the nature of the Ground nominal. As for the first criterion, these prepositions receive a directional meaning in the presence of motion verbs (e.g. *She jumped on/onto the bed*; *She fell in/into the pool*), and specifically verbs with a “light” manner component (cf. *Dad drove *in/into the car park*; *The bird flew *on/onto its perch*). Also, directional meaning with *in* and *on* requires a closer relation between a verb and its PP than the locative expressions with the same prepositions. The contrast between *Mary fell in the pool* and *Mary fell in the concert hall* illustrate the burden of the ground nominal in a particular reading. The first example has a directional interpretation due to real-world knowledge about bodies of water. In the second sentence the

on is beyond the scope of our analysis, which will only center on the stative interpretation of these prepositions. In contrast, this part of the dissertation will exploit the directional and motional potential of the preposition *to* and *into* in relation to the intransitive motion, intransitive resultative, resultative, caused-motion and *way* constructions. These prepositions are considered telic and they enable any motion verb to appear as the main verb in directional sentences (e.g. *Jill kayaked *on/onto the lake, Anna pirouetted *on/onto the stage*, examples extracted from Thomas 2004: 161; please note that the preposition *onto* is understood as a combination of *on* and *to*, where it is the element *to* which gives a directional meaning).

As advanced in section 4.1.1, the adverbial phrase of the intransitive locative construction can be more often than not realized by a figurative location as in *So many seeds of ideas may germinate in writers' minds* (Sketch engine doc#95025) or *The kingdom of God, which has so long been germinating in the hearts of men!* (Sketch engine doc#116601). What we can remark is that the abstract location (people's minds and hearts) correlates with an abstract subject referent (ideas and a religious feeling). Moreover, the intransitive construction proves to be very productive with figurative undergoers as a result of metonymic extensions. Thus, the basic meaning of the verb *bloom* relates to the emergence or appearance of a flower out of a container, namely the stem of a plant. This basic meaning is also exploited in sentences like *The longer one looked the more the rose seemed like blood blooming out of his mouth* (Sketch engine doc#326392) or *Light bloomed on the far side, illuminating a door in the arena's wall [...]* (Sketch engine doc#107850), in which blood and light share the same schema of emergence.

locative interpretation is more prominent because of the nature of the following NP. A directional reading would involve a scenario in which the woman falls into the concert hall via a door or an open window.

Another verb that shares the appearance meaning is *blossom*, as illustrated by the sentences *Charred hulks blossomed on the streets of the old colonial city* (Sketch engine doc#645895) or *Fresh tears blossomed in the corners of my eyes as I nodded once again* (Sketch engine doc#658139). The emergence schema is activated for the creation of an entity being associated with the primary scene of giving birth in which the newly born baby emerges out of the mother's womb. The verb *bloom* also has a health and freshness sense which is obtained through a metonymic extension from the natural process of blooming to what this process stands for, i.e. growth and development. This second meaning of the verb *bloom* is more frequent than the basic one probably because there can be many other possible source domains to express emergence (any scene in which an object comes out of a container or a bounded region): *come out of the closet, dig out, bring out, bring to light, bring forth, produce, etc.* However, the specific type of freshness and beauty associated with blooming is difficult to invoke in any other way.

Similarly, most verbs listed in the first group were found to participate in the intransitive temporal construction as can be observed in (8) (a)-(e):

- (8) a. *Many more - over 50 varieties in all, along with many perennials bloom all summer long* (Sketch engine doc#468)
- b. *His concert career blossomed in the mid 1960's alongside his opera work and his other passion for Berlioz [...]* (Sketch engine doc#556857)
- c. *His interest in mysticism flowered in the 1960s as a result of an encounter with then Harvard psychologist Timothy Leary [...]* (Sketch engine doc#420087)

d. *The El Guapo concept germinated* about ten years ago (Sketch engine doc#74333)

e. *In India, that ancient land of cults, a new belief system has sprouted* in recent years (Sketch engine doc#911220)

Example (8a) is a literal intransitive temporal construction, whereas the rest of the sentences are figurative instances in which the metonymic extension is employed (i.e. a career, an interest, a concept or system of beliefs are developing).

The intransitive resultative construction is the second type of configuration which is fairly productive with the first group verbs. It can be lexicalized by an adjectival phrase, a prepositional phrase headed by *to* or *into*, a combination either of an adverb and an adjectival phrase or of an adverb and a prepositional phrase. The combinatorial possibilities of these verbs are illustrated in Table 4.2:

AP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH FIRST GROUP VERBS	
<i>But worst of all, the yellow flowers in the kitchen vase bloomed blue</i>	Sketch engine doc#88417
<i>Luffa and sola plants still flowered a saffron yellow</i>	Sketch engine doc#1011853
<i>[...] a series of concentric burns blistered black on a surface that stays white even in summer</i>	Sketch engine doc#2368880
PP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH FIRST GROUP VERBS	
<i>In his youth, the qualities of foresight and planning bloomed to perfection [...]</i>	Sketch engine doc#101179
<i>Instantly attracted to each other, this encounter blossomed into the most intense relationship of Goldman's life</i>	Sketch engine doc#255172
<i>This idea of Canadian nationality later germinated into the 1947</i>	Sketch engine

Citizenship Act	doc#969117
<i>And as the spring came closer and closer, the tip nearest the ground swelled into a grotesque head [...]</i>	BNC ACV 1184
ADV+AP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH FIRST GROUP VERBS	
<i>Their throats [of roosters] would swell out big and then would come forth their booming challenge [...]</i>	Sketch engine doc#668491
ADV+PP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH FIRST GROUP VERBS	
<i>When, however, under her husband's wing she had blossomed out into a lovely womanhood [...]</i>	Sketch engine doc#645600

Table 4.2 THE INTRANSITIVE RESULTATIVE CONSTRUCTION WITH FIRST GROUP VERBS

The adjectival phrase denotes an A>A' type of change since it typically involves a change of a single property of an entity, i.e. its color or size. Sometimes the adjectival phrase can be syntactically separated from the verb by means of a preposition, either *in* or *into*. For the sake of clarity, consider the following examples listed below:

- (9) a. [...] *after winter rains the arid land bloomed in large patches of yellow, white and blue with the many small flowers of wild adenostema, sage brush, 'Spanish' violets, shooting stars, mimulas and white popcorn* (Sketch engine doc#499614)
- b. *In the window sill the flowers of bygone days bloomed in motley green* (Sketch engine doc#665157)
- c. *Here there are no roads, no towns, only the Judas tree which grows in astonishing profusion, blossoming each spring into a vivid pink that lends the island an otherworldly air* (Sketch engine doc#385859)

d. *When the sun broke through the clouds, the brown rock blossomed into earthy colors--ochre, sienna, umber, olive* (Sketch engine doc#638039)

e. [...] *brilliant trees flowered in a blaze of pure scarlet, and some in pure lavender [...]* (Sketch engine doc#2273575)

f. *In the freer spaces forget-me-nots flowered in nebulae, and dog-violets gave an undertone of dark purple, with primroses for planets in the night* (Sketch engine doc#2327813)

From a close inspection of examples (9)(a)-(f) we conclude that linguistic distance between the verb and its adjectival specification of result, which is within the scope of the prepositional phrase, complies with the part/whole affectedness principle and other dependency phenomena. At first we tried to explain the difference between a simple adjectival phrase resultative and the examples in (9) by looking at the *indirect/direct* causation dichotomy. Thus, Fodor (1970) distinguishes between *lexical causatives* (e.g. *Peter killed John*) and *analytical causatives* (e.g. *Peter caused John to die*). In his view, the former represent ‘atomic’ causal events whilst the latter depict ‘compound’ causal events. He accounts for the analytical *cause to* construction in terms of a temporal separation between the cause event and the effect event: “one can cause an event by doing something at a time which is distinct from the time of the event” (ibid: 433). Lakoff (1987: 55) also argues that “the more direct the causation, the closer the morphemes expressing the cause and the result” (cf. also Lakoff & Johnson 1980: Ch. 20; Haiman 1983). However, the indirect/direct causation distinction seems a rather implausible hypothesis for our case. First of all, one cannot say that in (9a), for example, there is a greater time lapse between the blossoming process and the coloring process just because the flowers are multi-colored: yellow, white, blue. Second of all,

the visual perception of the color occurs simultaneously with the blooming of the flower.

The difference between a sentence like *The flower bloomed red* and *The flower bloomed in motley red* lies in the fact that the first one receives a whole-affectedness interpretation whereas the second one can be given a part-affectedness reading. In the first example it is suggested that the surface of the flower becomes completely red. The second sentence does not imply that only a small surface of the flower became red but that the color that covers completely the surface of the flower is not homogeneously distributed. The petals of the flower have elements of great variety, thus, each hue occupies only a part of the surface of the flower. Also, the adjectival intransitive resultative *The flower bloomed red*, which calls for a whole affectedness reading, is in clear contradiction with the partial affectedness interpretation postulated by Broccias (2004: 109): “if an adjective in a resultative construction describes a property P of an affected object Y, then P describes any part of Y (if possible)”. This generalization would provide a convenient explanation for the ungrammaticality of a sentence like **He hammered the metal long/tubular/square*, where the adjectives *long*, *tubular*, and *square* cannot match with the resultative construction simply because they describe properties of the whole entity. Luzondo (2011: 171) correctly points out that the oddity of paraphrases like ?*We have drunk the barrels dry, but parts of it are wet*, ?*John pushed the door open, but part of it did not open* throws doubt on the validity of Broccias’s part-whole affectedness generalization for the resultative construction. Equally, the unacceptability of our own paraphrase ?*The flower bloomed red, but some parts of it were yellow* indicates that the color in the intransitive resultative construction is spread all over the surface of the flower. Example (9a) clearly illustrates that the colors *yellow*, *white*, *blue* refer only to a small portion of the surface of the arid land. In

a similar vein, the colors in (9d), i.e. *ochre, siena, umber, olive* cover parts of the surface of the rock. In (9f) the plural NP *nebulae* makes reference to a diffuse mass of interstellar dust or gas which visually blends luminous patches with areas of darkness and hints again at the heterogeneity of the color perception. In (9c) the color term *pink* becomes an NP by being incorporated into a relative clause, which probably motivates the absence of a canonical intransitive resultative construction.

The intransitive resultative construction with a prepositional phrase calls for an explanation based on what Ruiz de Mendoza (2008) has labeled *metaphoric amalgams*. A metaphoric amalgam is a type of metaphoric interaction which requires the integration of selected aspects from two or more metaphors that combine. There are two possible ways in which metaphorical structure can combine, namely single-source metaphoric amalgams and double-source metaphoric amalgams (cf. Ruiz de Mendoza 2008; Ruiz de Mendoza & Mairal 2011). Let us take into consideration the following sentence: *The concept bloomed into a debut cassette release [...]* (Sketch engine doc#446648). This sentence is based on a double-source metaphoric amalgam, as can be observed in Table 4.3 below:

Source \Rightarrow (natural process of blooming)	Target (change of state)	\Leftarrow Source (change of location)
Flower	Concept	Source
Bloom	Process (development)	Motion
Blossom	Result (cassette)	Destination

Table 4.3 *The concept bloomed into a debut cassette release*

A double source metaphoric amalgam involves two metaphoric sources that are mapped simultaneously onto the same target domain. In our example two metaphors interact: A CHANGE OF STATE (OF AN ABSTRACT ENTITY) IS BLOOMING and A CHANGE OF STATE IS A CHANGE OF LOCATION. Both metaphoric systems

blend into a more complex one in which ‘a concept’ undergoes a process of development understood in terms of self-instigated motion from a source to a destination. The destination of motion is seen to coincide with the resultant state of the abstract entity (‘cassette’).

At this point we would like to draw attention to the major role fulfilled by the lexical predicate in determining the nature of its constructional arguments. For instance, the verb *swell* in the intransitive resultative construction (Y BECOMES Z) designates the means by which transformation is achieved, i.e. physical expansion of a surface or rise of position on a scale. The verb *swell* in the intransitive resultative construction obeys the Internal Variable Conditioning constraint since the choice of the Z element is greatly constrained by the information encapsulated by the verb *swell* (i.e. an entity becomes bigger in size or the value of the entity goes up on scale) and also by the Y element. Thus, Z must be bigger in size or have a bigger value than Y. For validation purposes, consider the following sentences:

- (10) a. [...] *small settlements such as San Francisco swelled into cities* (Sketch engine doc#194954)
- b. *This was the signal for a general clamour, which beginning in a low murmur gradually swelled into a great noise in which everybody spoke at once* (Sketch engine doc#458499)
- c. *The work, which was originally meant to consist only of a few sheets, swelled into ten volumes* (Sketch engine doc#643101)
- d. *Let a gale arise and swell into a storm, let a sea run that might appal the stoutest heart that ever beat* (Sketch engine doc#708334)

Examples (10a) and (10c) evoke the expansion schema whereby the Y element (small settlements and the work consisting of a few sheets) increases in physical size until it becomes Z (a city or a work made up of ten volumes). By contrast, (10b) and (10d) activate the intensity scale whereby the Y element (the low murmur and the gale respectively) increases in intensity until it turns into Z (a great noise or a storm). All four examples observe the A>A' change schema. In (10a) and (10c) the city and the ten volumes work incorporate in their physical composition the small settlements and correspondingly, the few sheets. The prepositional *into* phrase is used to realize the A' element of the schema, since English does not code a resultative adjective that captures the conceptual structure called upon by *into cities/a great noise/ten volumes/a storm*. In cases like these, English makes figurative use of the caused-motion construction (compare *The blacksmith hammered the metal flat/into the shape of a fish/*into a flat shape*).

The intransitive resultative construction with *bloom* and *blossom* is regulated by the same Internal Variable Conditioning constraint. The meaning of these verbs is more generic as it involves either that an entity becomes bigger in size or goes from a lower-level stage of development to a higher-level stage of evolution, which does not necessarily imply that this is positive. Let us take a look at some examples:

- (11) a. *Instantly attracted to each other, this encounter blossomed into the most intense relationship of Goldman's life* (Sketch engine doc#255172)
- b. *What started as an entry-level job blossomed into a lifetime career and association with the University* (Sketch engine doc#268420)

c. *Their partnership blossomed into marriage and their artistic union created one of the greatest vocal phenomenon of this century* (Sketch engine doc#554595)

d. *Powell's class project blossomed into a full-blown grant proposal [...]* (Sketch engine doc#569026)

e. *[...] Cedar Hill has blossomed from a rural town of about 6,800 in 1980 to a cosmopolitan area with a population of almost 40,000* (Sketch engine doc#97371)

f. *As China's open door initiatives blossomed from slogan to reality at an astonishing rate, the gap between Chinese statistical categories [...] imposed growing costs* (Sketch engine doc#346706)

Sentences (11)(a)-(d) can be skeletally represented by the schema Y BECOMES Z. In these cases the Y element together with the verb *blossom* constrain the choice of the Z element which must be conceptually related to Y and must involve a higher-level of development than Y. In turn, (11e) and (11f) display the semantics Y TURN FROM S TO Z, where Y = Cedar Hill/China's open door initiatives, S = rural town/slogan, Z = cosmopolitan area/reality (i.e. S = initial state; Z = final state).

Although (11)(a)-(f) constitute positive changes of state, the intransitive resultative construction with the verb *bloom* can also encode negative end results, as can be seen in the examples reproduced in (12)(a)-(d):

(12) a. *As these growing gaps inevitably sow seeds of resentment among those less fortunate which perhaps bloom into terrible acts* (Sketch engine doc#472205)

b. *WHAT TODAY MIGHT be seen as an isolated problem for a limited number of companies promises to bloom into big trouble for us all* (Sketch engine doc#566316)

c. *The seeds have since bloomed into thousands of resistance fighters and foreign terrorists* (Sketch engine doc#593788)

d. *Epiphanies don't come much grander than that, and Shulgin's interest in psychoactive drugs bloomed into an obsession* (Sketch engine doc#1734479)

The examples above exploit another meaning extension of the verb *bloom* that focuses not on the youthful and vigorous aspects of blooming, but on the sudden appearance of the flower. It is a matter of attribute selection, which is typical of metaphorical extension (in a metaphoric mapping not everything is mapped but, on the basis of the Correlation Principle, only the source structure that best matches the implicational structure of the target; Ruiz de Mendoza & Santibáñez 2003; Ruiz de Mendoza 2011).

As mentioned earlier, the intransitive resultative construction can display a compound result expressed either by a combination between an adverb and an adjectival phrase or between an adverb and a prepositional phrase. Let us take each case in turn. The sentence *The balloon swells out tight and full* (Sketch engine doc#1041811) combines the adverb *out* with two adjectival phrases, i.e. *tight* and *full*. Our example might seem to contradict Goldberg's (1991b: 368) *Unique Path constraint*, which stipulates that "if an argument X refers to a physical object, then more than one distinct path cannot be predicated of X within a single clause". This constraint has two main entailments: (1) X cannot move to two different locations at a given time t; and (2) the motion must describe a path within a single landscape. Thus, resultatives are believed to

be incompatible with directional phrases (cf. **Sam kicked Bill black and blue out of the room*). Nevertheless, Goldberg's formulation of this constraint does not really explain why the constraint happens. The constraint is grounded in the physical impossibility of an integrated object following two different paths at the same time. Alternatively, she postulates the *Unique Change of State constraint*, according to which two distinct changes of state cannot be simultaneously predicated of an entity in a single clause.

The adverb *out* normally describes a path (e.g. *He went out*). However, *out* in our example indicates a result (swelling along the horizontal axis), which strictly speaking involves a path that is internal to the object. But there is no motion along an external path, which is what Goldberg's Unique Path constraint captures. *Out* indicates external orientation, whereas the composite adjectival phrase parametrizes the property acquired by the inflated balloon. The adverb *out* evokes the surface expansion schema, whilst the adjectival phrase refers to the size of an entity. Also, the adjectival phrase tinges the intransitive resultative construction with telicity: the balloon inflates until it becomes tight and full. The adjectival phrase complies with the Unique Change of State constraint in the sense that it further specifies the result designated by the adverb *out*. Therefore, we can have conceptually feasible combinations of results provided that they are compatible. The same holds true for the intransitive resultative construction which employs a combination between an adverb and a prepositional phrase *This thinking blossomed out in Buddhism's greatest contribution to mankind, namely the concept of mettā [Skt. maitrā] or universal loving kindness* (Sketch engine doc#940191). This is a metaphorical expression that makes use of the basic emergence meaning of the verb *blossom*. The emergence of a flower out of the stem of a plant (in the source domain of the metaphor) is mapped onto the emergence of an ideological precept out of an ideological movement. The preposition *in* does not code any motion but it figuratively

expresses a state (*kindness*). Its use is licensed by the low-level metaphor STATES ARE LOCATIONS.

In 4.1.1 a distinction has been made between purely L-Subject constructions and deviated intransitive causal constructions. The subject position of the former coincides with the semantic function of location, whereas the subject of the latter is no longer a place but an abstract entity. It has been argued that a sentence like *The orchard now blooms with apples [...]* (Sketch engine doc#200425) is motivated by the high-level metonymy A PROCESS (IN A LOCATION) FOR AN (INSTRUMENTALLY) CAUSED EVENT, whereby the orchard is regarded as being able to ‘bloom’ by making use of the apple trees as an instrument of action. This sentence could be paraphrased as *The apple trees bloomed in the orchard*. There is a metonymy CONTAINER FOR CONTENT whereby the orchard stands for the plants located in it which undergo the natural process of blooming. The result of the blooming process is expressed by means of a company complement introduced by the polysemic preposition *with*. The noun *apples* cues the metonymic target, which is the apple trees (see Ruiz de Mendoza 2011 for further discussion of the cueing operation).

By contrast, consider the example *Western civilization bloomed with the Christian religion [...]* (Sketch engine doc#2360092). In this utterance the Western civilization is not a location but an abstract entity which undergoes a process of development directly caused by the advent of Christianity. The term civilization metonymically stands for the significant landmarks of a culture, i.e. architecture, poetry, etc. Nevertheless, the relationship between the subject and the *with* element is somewhat similar to the one established between an orchard and the apples located within its boundaries. Any civilization is a set of cultural elements and religion can be understood as one of them.

There is a symbiotic relationship of co-evolution and mutual benefitting between the Western civilization and Christianity. At the beginning there were two distinct separate entities, i.e. the Roman culture and the ideological Christian movement. The Christian religion is engulfed within the Roman culture becoming a part of the latter. Thus, the preposition *with* can be said to conflate three different domains: causality (Christianity makes the Western civilization thrive), company (Christianity co-exists with other Western cultural elements) and instrumentality (the Western civilization makes use of one of its cultural components to reach maximal development). The conflation of these three domains is visually represented in Figure 4.4 below:

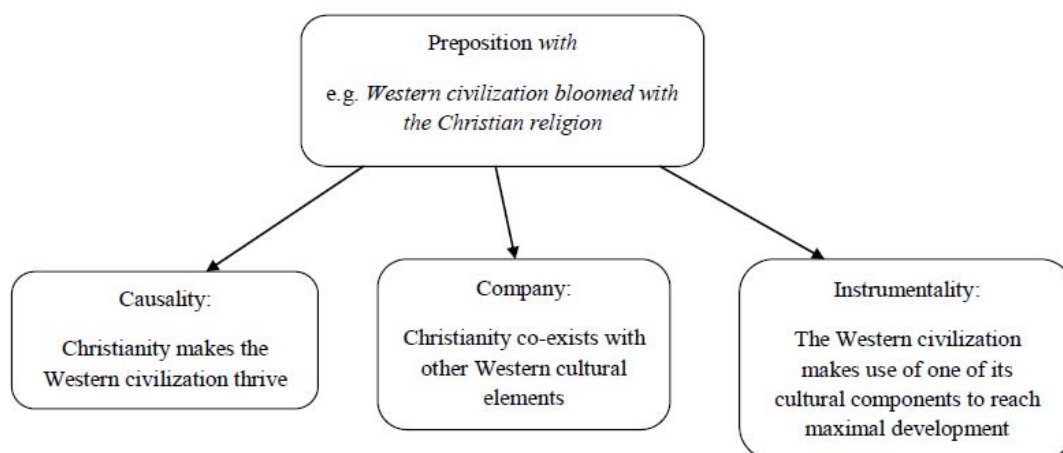


Figure 4.4 Conflation of causality, company and instrumentality

Causality can be expressed either by means of the preposition *with* or *in*. Consider the example *His face was blistering in the heat [...]* (Sketch engine doc#715101), where the preposition *in* conflates location, state and causality (i.e. the skin is exposed to the sun, feels hot and the heat causes the emergence of blisters on a person's face). In some cases the cause can be concrete (e.g. *Once attached [to your ferret], they [ticks] bury their head into the flesh and the body swells up with engorged blood*; Sketch engine doc#163143; *Even after they are spawned, when they [eggs] swell up with seawater,*

[...]; Sketch engine doc#398027, where the physical cause combines with a result lexicalized by the adverb *up*) or abstract (e.g. *Fox viewers swell up with pride*; Sketch engine doc#41852; *The little cats have six toes and no tails to swell out in fury at the sight of a dog*; Sketch engine doc#49242, where the cause of the physical expansion is an emotion). Also, the intransitive causal blends with an intransitive resultative construction which can be encoded either by a prepositional phrase or an adjectival phrase as in *The veins swelled dark on his forehead with surcharge of passion* (Sketch engine doc#667737) or *And the mother's heart swelled big with anguish* (Sketch engine doc#1167890).

At an earlier stage of this chapter, it has been shown on the basis of examples from our corpus that –contrary to Levin (1993)– verbs that denote inherent natural processes can be transitivized through the metonymy A CAUSED EVENT FOR THE CREATION OF CONDITIONS THAT ENABLE A PROCESS (e.g. *In the laboratory, Ms. Taylor hand pollinated potted plants and germinated the resulting seeds, and also germinated wild-collected seeds from her field site*; Sketch engine doc#4621, in which a biologist makes seeds germinate by direct manipulation). A verb like *blister* can easily participate in the causative configuration because the formation of a blister is not part of the natural process of evolution of our skin as is the case of buds/shoots that bloom/blossom/flower/sprout out of the stem of a plant. A blister is an imperfection of the skin or any other surface and it has a negative default interpretation. In the sentence *The alkali was so strong in the water that it blistered our feet and legs [...]* (Sketch engine doc#41267), the alkali, which is an aqueous solution, has a direct harmful effect on the human skin causing the formation of blisters. Also, the repeated friction between the hard surface of shoes and the sensitive surface of the skin can cause blisters on a person's feet (e.g. *My stooped [sic] shoes are blistering my heels*; Sketch engine

doc#656100). The transitive construction can combine with the expression of the cause as in *He [...] blistered the paper with a rain of tears that eased his heart* (Sketch engine doc#715474), where the direct contact between a person's tears and a piece of paper causes the surface of the paper to become crumpled once it is dry.

The verb *swell* can also be used in a transitive construction combining with the expression of the cause as in *Relatives could swell the fund with their own contributions [...]* (Sketch engine doc#102403), in which the instrumental complement conflates manner (a non-physical instrument) and cause. People can cause an amount of money to increase by contributing an additional amount. Lastly, verbs describing inherent natural processes are more common in the causative construction when they have a figurative meaning as evidenced by the sentences below:

- (13) a. *To that end, the Malebolgia has each chosen soul trained, nurtured to violence, so that they bloom a hideous flower of evil and murder* (Sketch engine doc#748326)
- b. *Treatment was a series of mental and physical exercises designed to "bloom the individual"* (Sketch engine doc#57940)
- c. *Mustapha, my son, has only come to blossom the splendor of a rich tradition that is a part and parcel of our heritage* (Sketch engine doc#558976)
- d. *Over the next seven years they will work together to build and blossom the commercial performance of the club* (Sketch engine doc#710453)

e. *As March observes, the ending of the story, while noting the insignificance of small lives, also suggests a determination that may germinate positive change* (Sketch engine doc#20882)

f. *Her invention has been so popular it has sprouted two successful companies* (Sketch engine doc#101326)

Examples (13)(a)-(f) suggest the following: (i) people can cause the development of an abstract entity, such as negative feelings and behavior in (13a), tradition in (13c), or a business as in (13d) and (13f); and (ii) an abstract entity, such as treatment in (13b), can cause the development of an individual.

Regarding the intransitive motion construction, two verbs of the first group were found to collocate with it. Consider the sentence *Two space shuttles bloom forth from its center, their rockets docked in the funnel's interior* (Sketch engine doc#295913). As has been argued previously, the verb *bloom* has a basic emergence meaning whereby a flower comes out of the stem of a plant. This example is based on a resemblance image metaphor: the source has a plant in flower; in the target the flowers in the plant map onto the space shuttles and the plant onto whatever structure supports the shuttles. The second verb is *sprout* and it has a figurative meaning, e.g. *The ones that are rich and successful always have a beauty sprouting off their arm* (Sketch engine doc#1397345). In this sentence the abstract noun *beauty* can be literally interpreted as money being produced by a person's skill (the noun *arm* stands metonymically for the work that can be performed with that arm) as if by a natural process (in the same way as a flower blooms off a plant).

Only the verbs *blister* and *sprout* appear in the caused-motion construction, usually in figurative expressions. The sentence *Blackeye, you have single handedly*

blistered the pants off of every person *hoping to make a casual comment on Gore's reelection prospects* (Sketch enginedoc#1270461) maps a hypothetical scenario (e.g. Blackeye removes the pants off other people, thus causing the formation of blisters) onto a real life situation in which Blackeye's comments cause other people to feel embarrassed. Consider the examples in (14) in which *sprout* participates in the caused-motion construction:

- (14) a. *I'm going to get you, sooner or later, if I have to sprout wings out of my shoulder-blades to do it!* (Sketch engine doc#626663)
- b. *I could be yammering away on a cell phone while knitting, sprouting switchblades out of my skull like Pinhead, and bursting into flames* (Sketch engine doc#1333321)
- c. *In other plays, when really crazy things start to happen (a castle, rooted in manure, starts growing higher and higher until it sprouts a chrysanthemum bud out of its dome* (Sketch engine doc#121135)

All the examples above exploit the basic emergence schema, which captures the idea of an entity coming out from the interior of another entity, which in turn is envisaged in terms of the container schema (wings come out of shoulder-blades in (14a), switchblades emerge from the skull in (14b), and a chrysanthemum bud comes out of the dome of a castle in (14c)). The constructional subevent encodes motion of an entity out of a container, whilst the verbal subevent indicates the means by which motion is achieved (i.e. by sprouting).

The resultative construction was very scarce in our corpus. It was found with verbs like *blossom* or *swell* as illustrated in the examples displayed below:

- (15) a. *It is wonderful how the solitude of waste places will blossom the most ordinary woman into a flower of delight to the masculine eye; and the lean, anaemic, scrawny-haired school teacher had held as admirers all of Cameron's gang, and one Sergeant Heath of the Mounted* (Sketch engine doc#273755)
- b. *In addition to this, she owns her own company; and her percentages from the plays swell her income to a million dollars a year* (Sketch engine doc#101723)
- c. *On the muddy slope at Gobbler's Knob, busloads of spectators swelled the crowd to about 20,000 by 7 a.m., according to Groundhog Club estimates* (Sketch engine doc#45160)

Example (15a) is a metaphorical expression in which circumstances (solitude) can influence men's visual perception, i.e. they see a plain looking woman as a very beautiful creature. The metaphor MORE IS UP allows us to understand an increase in amount as metaphorical motion on a vertical scale. The preposition *to* represents the resultant state of the motion, namely in (15b) the woman is one million dollars richer whereas in (15c) the crowd becomes bigger in size. In (15a) solitude or "loneliness" is a trigger for a psychological state that will then have physical effects (in terms of beauty). A change of (physical) state (as a symptom of a change in psychological state) is figuratively seen as a change of location. This example is an instantiation of a resultative pattern that makes use of the caused-motion construction. The causer of motion maps onto the trigger of the psychological state (cause) that has physical consequences (effect) (there is a CAUSE FOR EFFECT metonymy built into the trigger element of the metaphorical target), motion maps onto the change of state and the

destination of motion onto the resultant state. In combination with this high-level metaphor (which licenses the resultative use of the caused-motion construction), we also have a high-level metonymy: A CAUSED EVENT FOR A(N INSTIGATED) PROCESS. This metonymy has the transitive use of *blossom* in the source and the natural process in the target. Obviously, this metonymy allows for a causal constructional pattern to be used to talk about an instigated change of state. That is, the metonymy licenses the high-level metaphor, which in turn licenses the use of *blossom* with the caused-motion construction. *A flower of delight* expresses the resultant state through OBJECT FOR PROPERTY combined with EFFECT FOR CAUSE, where the cause is the (implicit) property.

Finally, only five verbs in the first group were found to match with the *way* construction:

- (16) a. *It was pleasant and cool out there, for a big climbing rose with a yellow cup and a flaming heart bloomed its way up and past the eaves of the porch [...]*⁶⁶
- b. *Her carriage was magnificent: she bloomed her way into maternity like an orange-tree, white and golden [...]*⁶⁷
- c. *[...] this special flower had twined and blossomed its way through history like no other*⁶⁸

⁶⁶ Google Books: *The century illustrated magazine*, edited by Josiah Gilbert Holland & Richard Watson Gilder (1897). Accessed on May 3, 2012.

⁶⁷ Google Books: *Broome stages*, by Clemence Dane (1936). Accessed on May 3, 2012.

⁶⁸ Google Books: *The book of the rose*, by David Squire & Jane Newdick (1991). Accessed on May 3, 2012.

d. *These two streaks of tears reminded me of the stalk of the rose flower pressed under the block of cement, as well as the flower bud that sprouted its way through the crevice*⁶⁹

e. *Leave them here until the flower swells its way up among the developing leaves*⁷⁰

f. [...] *Olympic bronze medalist Eliud Kipchoge of Kenya blistered his way to a new American All-Comers Record [...] (Sketch engine doc#778235)*

Examples (16a), (16d), and (16e) all refer to the blooming process of a flower during which the plant expands its surface by moving upwards. The vertical path followed by the plant is not pre-established since it is created along with the blooming process. In (16b) the pregnancy period is metaphorically conceived as a path during which the beauty of the woman has increased. (16c) indicates the manner in which a plant species achieves continuity over time. In example (16f) the verbal predicate constitutes the means by which the medalist obtains a title in some book of records. This sentence depicts an event in which an activity, i.e. walking, is performed in excess. The subsumption of the verb *blister* into the *way* construction, on the one hand, points out the result of the effort carried out by the Agent who blisters his feet and, on the other hand, suggests that, despite the obstacles, the path has been successfully completed. In the LCM the *way* construction is licensed by the high-level metonymic chain MEANS/MANNER FOR ACTION FOR RESULT (Luzondo 2011), where the means/manner component is highlighted as can be observed in Figure 4.5:

⁶⁹ Google Books: A rose, journal article by Y. Kwui (1980). Accessed on May 3, 2012.

⁷⁰ Google Books: Amateur gardening magazine (1948). Accessed on May 3, 2012.

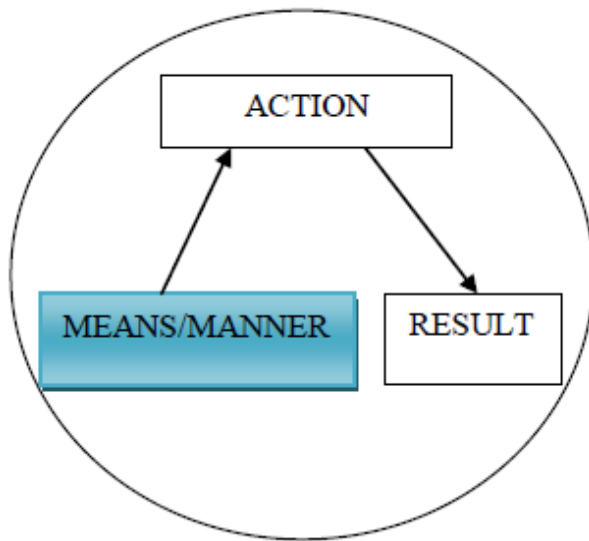


Figure 4.5 Highlighting in the MEANS/MANNER FOR ACTION FOR RESULT metonymic chain

4.2.3. Verbs of the second group

As mentioned in 4.2, we have decided to neatly separate the verbs that generically encode a positive change of state (verbs of the first group, such as *bloom*, *blossom*, *germinate*) from the verbs that code a negative transformation (verbs of the second group, such as *burn*, *corrode*). Levin's (1993) list of entity-specific change-of-state verbs comprises thirteen predicates that describe a negative transformation which in some cases may lead to the disintegration of the undergoer, viz. *burn*, *corrode*, *decay*, *deteriorate*, *erode*, *molder*, *molt*, *rot*, *rust*, *stagnate*, *tarnish*, *wilt*, and *wither*. These verbs are more likely to combine with the A>B schema since they entail a conspicuous change on the part of the object (e.g. *His ship was going to enter Jupiter's atmosphere and burn* into cinders; Sketch engine doc#215200). A short observation related to the syntactic realization of the A>B change schema is in order here. Contrary to Luzondo (2011: 221), we believe that the A>B schema can occasionally occur with end-results

lexicalized both by a prepositional phrase and an adjectival phrase. In the example *His room grew dark; the fire burned dead [...]* (Sketch engine doc#108722), the adjective *dead* evokes an A>B schema where the fire shifts from a state of existence to one of non-existence. The verbs of the second group can also exploit an A>A' schema where the undergoer acquires a new property which does not alter the 'core' nature of the affected entity. Thus, in the intransitive resultative sentence *Her parted lips burned scarlet* (Sketch engine doc#73018) the verb *burn*, which is used hyperbolically to refer to intense heat emanating from the human body, does not result in the destruction of the undergoer. This construction blends tactile sensations with visual perception, i.e. something invisible to the human eye caused her lips to grow in temperature thus acquiring a vividly red appearance.

4.2.3.1. Verbs of the second group in FrameNet

Only seven verbs of the second group were found in FrameNet, namely *corrode*, *rust*, *tarnish*, *rot*, *decay*, *molder*, and *burn*. The first three verbs are conceptually related in the sense that there is an overlap of the frames they activate. Thus, the verb *corrode*, which displays two main frames, i.e. 'corroding' and 'corroding_caused', shares its first frame with *rust* and its second frame with *tarnish*. The main difference between the corroding and the 'corroding_caused' frame is that the latter adds two more core FEs beside the undergoer, viz. the Agent and the Cause. The Agent is always an individual that causes the corrosion (e.g. *At first he corroded the surface of the stone with aquafortis [...]*)⁷¹ whereas the Cause can be an animate or inanimate entity, a force or

⁷¹ Google Books: *Chats on old prints*, by Arthur Hayden (1923). Accessed on February 17, 2012. It should also be noted that although FrameNet lists the Agent as one of the FEs of the 'corroding_caused' frame, no example is provided to support their claim.

an event (e.g. *The acid corroded the metal*). What we find surprising is that FrameNet has listed only the ‘corroding’ frame for the verb *rust*. This predicate can also evoke the ‘causation of corrosion’ frame as illustrated by transitive sentences like *The moist air rusted the latch on the door* or *Keep up your bright swords, for the dew will rust them* (*Merriam Webster Online Dictionary*). It is common knowledge that a metal cannot rust by itself. It is always the action of air, water or an acid which causes the metal to acquire a reddish brown color. By the same reasoning, the intransitive use of the verb *tarnish* can evoke a ‘corroding’ semantic frame, which is not included for this verb in FrameNet (e.g. *Gold does not tarnish easily*). The formation of rust on a metal is produced by an external cause just as much as the discoloration of a metal surface.

Exactly like *corrode*, the verb *rot* has two main semantic frames: a ‘rotting’ and a ‘cause to rot’ frame. The first frame was postulated in order to account for the intransitive uses of this predicate, whilst the second one accounts for its transitive use by the inclusion of an Agent (cf. *She said that ‘he rotted the blinds’ by keeping his window open*)⁷² or a Cause (e.g. *Leprosy rotted the flesh from their bones*; COCA 1992). As was the case with the verb *corrode*, the Agent is mentioned as a core FE in the ‘cause to rot’ frame, but there are no examples that could substantiate these assumptions. Both *decay* and *molder* share the ‘rotting’ frame which has no cause for the decomposition undergone by an entity. Although the transitive use of these verbs is becoming obsolete, we have come across examples which activate the ‘causation of decomposition’ frame, e.g. *Pollution has decayed the surface of the stonework on the front of the cathedral* (*Cambridge Online Dictionary*); *Winter mouldered the footprints of besmirching snow [...]*.⁷³ FrameNet annotations for these verbs instantiate the most

⁷² Google Books: *A biography of Edward Marsh*, by Christopher Hassal (1959). Accessed on February 17, 2012.

⁷³ Google Books: *Glasgow: fabric of a city*, by Maurice Lindsay (2001). Accessed on February 17, 2012.

typical combinatory affordances of a predicate, as evidenced by the following sentences:

- (17) a. *Acid water trouble corrodes pipework.*
b. *Hairsprays, nail enamels and make-up could tarnish the gold.*
c. *Our old metal gutters are rusting badly- what should I replace them with?*
d. *Linen and lace had rotted into cobwebs on the beds, where now there were only twisted brass bones.*
e. *Their flesh decays, their shells and their bones become scattered and turn to powder.*
f. *Athelstan had returned but his brother's body still lay mouldering in some forgotten field in France.*

Examples (17)(a)-(f) constitute literal instantiations of the predicates under scrutiny, where the undergoer (pipework, gold, metal gutters, linen and lace, flesh, body) is always an organic entity that suffers a process of gradual decomposition, which in some cases is externally caused (acid water trouble, hairsprays, nail enamel and make-up).

Although FrameNet is useful because it helps us “to identify verb classes based on their ability to describe similar types of scenes or situations” (Boas 2011b: 216), it has the disadvantage of disregarding more unusual configurations that are contemplated in other corpora. FrameNet lists only one figurative use of the verb *corrode* (cf. *His disappointment had corroded his concentration*) but nothing is said about what motivates the occurrence of this verb in this metaphorical environment. What is more, Boas himself (2010: 57) argues that “while the role of metaphor in structuring language has been amply demonstrated in the literature, its role in licensing particular argument structure constructions remains a matter of debate” and “it is not entirely clear how

metaphorical extensions can be systematically restricted to avoid unacceptable sentences”. That is why we have chosen a more encompassing approach provided by the analytical apparatus of the LCM, which stresses the importance of high-level metaphor and metonymy as licensing factors of syntactic behavior, as demonstrated in section 2.9.3. Among the high-level metaphors and metonymies that underlie grammatical processes, we can mention the following: (i) THE TIME FOR ACTION metonymy (see Kövecses & Radden 1998), which allows the noun *summer* to undergo categorial conversion, thus, becoming a verb ‘to spend the summer’ (e.g. *An injured bird also summered at Darwell Reservoir in 1958*); (ii) A SOUND ACT IS AN EFFECTUAL ACTIVE ACCOMPLISHMENT (cf. Baicchi & Benedetti 2010) permits the subcategorial conversion of a *sound emission* verb like *wail* which changes into an active accomplishment predicate (e.g. *Police car wailed its way towards them up Wimbledon Hill*; BNC 68235 HR8); (iii) the GENERIC FOR SPECIFIC metonymy (see also Ruiz de Mendoza & Díez 2002, 2004), which motivates the parametrization process whereby a generic lexical item stands for a more specific one (e.g. *What’s Tom?*, where the generic *what is* question is a specific way of asking either about Tom’s job, i.e. an architect or Tom’s role, i.e. a leader). So, limiting our study to literal utterances in which an organic entity undergoes decomposition would result in a rather impoverished analysis.

Regarding the verb *burn*, this predicate displays four semantic frames: ‘experience_bodily harm’, ‘cause_harm’, ‘perception_body’ and ‘emotion_heat’. In the first frame, an experiencer injures a part of his/her body on an injuring entity (cf. *Melanie burned her mouth on scalding tea*; COCA 1993). In the second frame an Agent injures a Victim (cf. *They burnt him alive in the village square*; BNC CJP 620). The ‘perception_body’ frame refers to an experience that perceives high temperature on

some part of his/her body (cf. *Evelyn went cold inside and her skin burned all over*; COCA 1990). The last frame describes a (usually negative and uncontrollable) emotion experienced by an individual as in *Her lips tightened and a flame of anger burned across the cheekbones Montgomery had admired* (COCA 1988). However, even if FrameNet lists this figurative use of the verb *burn*, it still falls short of accounting for how *burn* is used within a metaphorical expression. In this respect, we contend that the association of a negative emotion like *anger* with the verb *burn* is not a random connection. Kövecses (1990) points out that there is a clear connection between the cultural model of the physiological effects of anger and the conceptual expressions coding this emotion. Anger manifests in the body through increased body heat, increased heart rate and blood pressure. Therefore, it is not surprising that anger is expressed by means of verbs related to fire which produces extreme heat. The previous example is motivated by Kövecses's (1990: 58) primary metaphor ANGER IS FIRE which has an experiential basis. This metaphor displays the correspondences illustrated in Table 4.4 below:

SOURCE	TARGET
Fire	Anger
Entity burning	Angry person
Cause of fire	Cause of anger
Intensity of fire	Intensity of anger
Physical damage to burning entity	Mental damage to angry person

Table 4.4 Kövecses's metaphor ANGER IS FIRE

Furthermore, the capacity of the entity burning to fulfill its normal function correlates to the capacity of the angry individual to function normally, whereas the

entity at the point of being consumed by fire in the source domain corresponds to the person whose anger is at the limit in the target domain.

Consider the sentence *Kate's eyes burned with a fury that was fast reducing her to speechlessness* (COCA 1993). Following FrameNet's rationale, we could simply assign the NP *fury* the semantic role of cause and leave the reader do all the inferential work. Nonetheless, the LCM would claim that such a sentence is grounded in a metaphor according to which eyes are objects in combustion.

4.2.3.2. Verbs of the second group and their constructional behavior

All things considered, we move on to examine the principles that regulate the rich syntactic distribution of verbs of the second group. The distributional patterns in Table 4.5 range from more productive constructions such as the intransitive locative/temporal/frequency construction, the intransitive resultative, the causative and the intransitive causal, to less prototypical constructions for this verb class such as the intransitive motion, the caused-motion, and the resultative construction.

Second group verbs	Intr. loc/temp/freq	Intr. resultative	Causative	Way constr	Intr. causal	Intr. motion constr	CM constr	Resultative
Burn	X	X	X	X	X	X	X	X
Corrode	X	X	X	X	X			
Decay	X	X	X	X	X			
Deteriorate	X	X	X		X			
Erode	X	X	X	X		X	X	X
Molder	X	X	X	X		X		
Molt	X	X	X	X			X	X
Rot	X	X	X	X		X	X	X
Rust	X	X	X	X	X	X		
Stagnate	X		X		X			
Tarnish	X	X	X		X			
Wilt	X	X	X	X	X	X		X
Wither	X	X	X	X	X		X	X

Table 4.5 The syntactic distribution of second group verbs

As far as the intransitive locative construction is concerned, the location where the event takes place can be either a real place in the world (e.g. *But that doesn't stop this visitor from asking for them every time, just to annoy the gloomy girls who microwave the Russian food that stagnates in metal troughs*; Sketch engine doc#50898; *Everywhere crops had withered in the fields, plants were dying*; Sketch engine doc#314400) or a figurative location (e.g. *I had great expectations, sings Williams, hope wilting away in his voice*; Sketch engine doc#448808; *The oaths wilted on Ellis's lips; his voice almost deserted him*; Sketch engine doc#231175). Just like in the case of verbs of the first group, the time when an event occurs can combine with its location (cf. *Apart from tourism, sugarcane has been rotting in the fields during Fiji's crisis*; Sketch engine doc#21633). In the sentence *The physical body that we have at present is continuously forming and decaying from cradle to coffin* (Sketch engine doc#665489), the prepositional phrase *from cradle to coffin* is based on a metonymy in which two physical entities stand for the time when these objects are used, i.e. childhood and a funeral. The intransitive frequency construction was found with the verb *molt* and it can combine either with an intransitive locative construction (e.g. *All cicadas molt four times underground*; Sketch engine doc#246553) or an intransitive temporal construction (e.g. *The nymphs will molt several times before developing wings and becoming an adult*; Sketch engine doc#452593).

The second most productive construction is the intransitive resultative configuration in which the end-result can be realized by an adjectival phrase, a prepositional phrase headed by *into*, *to*, or *out of*, a combination of an adjectival phrase and a prepositional phrase, and a combination between an adverb and a prepositional phrase, as exemplified in Table 4.6 below:

AP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH SECOND GROUP VERBS	
<i>The new mixture burns very hot, pushing the efficiency of the plant's gas turbines</i>	Sketch engine doc#138125
<i>The mulberry-trees were neglected, the tobaccoplants were last years, rotting yellow</i>	Sketch engine doc#638670
<i>[...]Until our toolbox rusted shut and we couldn't get to our duct tape</i>	Sketch engine doc#738037
<i>We are sunflowers Though our colors may fade, Our stalks wither brown, We never ever ever frown</i>	Sketch engine doc#497205
PP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH SECOND GROUP VERBS	
<i>[...] they [the pyrite fossils] will eventually corrode into a pile of rust, [...]</i>	Sketch engine doc#811594
<i>[...] thorium-230 [...] decays into radium, which later decays into radon</i>	Sketch engine doc#306081
<i>The fighting in Lebanon is deteriorating into a full scale war</i>	Sketch engine doc#179552
<i>[...] the rock had been exposed in several places, and eroded into a line of towers and pinnacles</i>	COCA 1991
<i>[...] his bones remained there in the cupola for many years [...] until they moldered into dust</i>	Sketch engine doc#850879
<i>The larva molts into the protonymph in about two weeks</i>	Sketch engine doc#215063
<i>Underfoot, last year's leaves had rotted into a soft mould which gave off a pleasant nutty scent</i>	COCA 1985
<i>The war machines and equipment will rust into worthless junk [...]</i>	Sketch engine doc#1575615
<i>Teaching can easily stagnate into a set of half-understood routines [...]</i>	COCA 1990
<i>[...] the darkness was wilting into daylight</i>	Sketch engine doc#2327813
<i>[...] five prostitutes burned to death when a fire broke out in a brothel</i>	Sketch engine doc#6013

<i>When uranium decays to lead, a by-product of this process is the formation of helium [...];</i>	Sketch engine doc#1648821
<i>[...] the bottom sheet of the stack deteriorated to dust</i>	Sketch engine doc#371846
<i>The goodwill around land reform [...] may have eroded to a situation that is now currently labeled as a crisis or impasse</i>	Sketch engine doc#388643
<i>The nymphs molt to adults in the fall</i>	Sketch engine doc#123786
<i>They are dead names, all the life withered out of them</i>	Sketch engine doc#2273575
AP+PP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH SECOND GROUP VERBS	
<i>I shut my eyes and that torrid sunbeam burned red through my lids</i>	Sketch engine doc#42765
ADV+PP INTRANSITIVE RESULTATIVE CONSTRUCTION WITH SECOND GROUP VERBS	
<i>Dead in the prime of his years/And laid in the lap of the dust/Only a handful of ashes/Mouldering down into dust</i>	Sketch engine doc#1421996
<i>[...] the upper parts of alder piles have been eroded down to a flat plain, [...]</i>	Sketch engine doc#851248
<i>In this manner their fundamental teachings have been preserved in their style up to the present, instead of withering away into the empty formulas of scholasticism</i>	Sketch engine doc#1658416

Table 4.6 THE INTRANSITIVE RESULTATIVE CONSTRUCTION WITH SECOND GROUP VERBS

The intransitive adjectival resultatives, also called property resultatives, are represented by the A>A' schema, since the patient undergoes a light transformation of one of its properties (e.g. the mixture rises in temperature; the color of the tobacco plants and stalks becomes yellow and brown respectively; the toolbox becomes hermetically shut and inaccessible). A copular relationship can be established between the subject and the adjectival phrase (e.g. *The mixture is very hot/The tobacco plants are yellow/The toolbox is shut/The stalks are brown*). The change experienced by the

subject patient is not a transcendent one, i.e. the mixture remains a mixture even if its temperature increases, the toolbox is still a toolbox even if it rusts, etc.

When the patient is affected to the extent of reaching a completely different state (A>B), the prepositional phrases *into* or *to* are preferred over the adjectival phrase. The intransitive prepositional resultatives are motivated by the high-level metaphor A TELIC PROCESS IS AN EFFECTUAL ACTION. These two prepositions activate different cases of image-schematic construal. The process of negative transformation (e.g. corrosion, deterioration, erosion, stagnation, wilting, rotting, decaying, rusting, moldering and molting) is conceptualized as figurative motion into a CONTAINER, that is to say, a three-dimensional location enclosing the subject referent as a whole. When the preposition *to* is employed, the subject patient is depicted as a traveler through the activation of the PATH image-schema. The two image-schemas profile a different portion of the motion of an entity from a source to a destination. Thus, the preposition *into* gives prominence to the final point on the path traveled whereas the preposition *to* highlights the entire route followed by the entity from a source to a goal.

At this point, it is crucial to consider Evans & Tyler's (2004) hypothesis according to which the motional reading of an utterance is not contributed by prepositions but it is rather derived from the sentential context, generally from verbs or from general pragmatics and our knowledge of the world. The motional meaning is distributed across the sentence, i.e. motion follows from the nature of the activity being engaged in, the nature of the TR (trajector) and LM (landmark). To make their point clear they analyze the case of the preposition *to*, which is believed to code solely *orientation* (e.g. *He stood with his back to me*, in which no motion is implicated and there is no path along which the TR could move; the TR (he) is not oriented toward the LM (me)) and *goal* (e.g. *As Jim was being verbally attacked in the meeting, he looked to*

his line-manager (for support), in which the orientation of the gaze is motivated by a particular goal, i.e. Jim wants his line-manager to support him verbally). The authors contrast the sentence *He ran to the shop* with *He ran toward the shop*. In the first one the TR (he) is directed with respect to the shop (LM) and the LM also constitutes his goal (e.g. the TR wants to buy something from the shop). Thus, they blend the orientation and the goal meaning, which are claimed to be provided by the preposition *to*. The second sentence does not entail that the shop is reached despite the use of the same motion verb. It is assumed that in the first example a path is evoked by the conjunction between a motion verb and the preposition *to* whose combination results in a reading in which the subject referent does arrive at the shop.

It is important to notice that all the examples that they give to justify the motional meaning employ motion verbs like *run*, *walk*, *go*, *drive*, or *cycle*. So it is easy to say in this context that the motional meaning is supplied uniquely by the verb and that the preposition *to* has no role. However, how can we account for motional meaning in the absence of a motion verb and with the non-motional meaning attributed to the preposition *to*? In the sentence *Busloads of spectators swelled the crowd to about 20,000* can we really say that *swell* involves motion by swelling? And if the preposition *to* were to encode only orientation on the amount scale and goal, how would we be able to explain that there is some result, i.e. the amount of people does in fact increase? Then, it would mean to say that the result is only conveyed by the verb *swell* which indicates that the crowd became bigger in size and what *to 20,000* contributes is a parametrization of how big the crowd was. Contrary to their claims, the preposition *to* can invoke motion without a motion verb being present: *I have been to Boston several times* implies that the speaker has gone to Boston and has returned (several times). Interestingly, the stative verb *be* is used. Then, consider how the metaphor TIME IS

SPACE works on the basis of the preposition *to*: *She was here from 9 am to 5 pm*. We understand a stretch of time in terms of motion from a source (the beginning of the time period) to a destination (the end). Evans & Tyler (2004) give no evidence for their claims. Also, they do not offer any empirical support for the contention that the motion interpretation comes exclusively from the context, world knowledge or general pragmatics.

Pursuing our analysis further, it has been observed that the verb *burn* collocates with a destructive end-result that can be lexicalized either by an adjectival phrase such as *dead* (e.g. *The flame burnt dead*) or a prepositional phrase such as *to death* (e.g. *They burnt to death*). According to Goldberg & Jackendoff (2004: 561) the adjectival phrase *dead* suggests that “the endstate is an instantaneous result of the action denoted by the verb”. They contrast the sentence *Riddling him with 16 bullets, Billy Bob shot him to death/??dead* with *Firing a single bullet to the heart, Billy Bob shot him dead/?to death*. In the first example the use of several shots indicates that the death process is longer than in the second example in which only one shot causes a person to die instantly. Boas (2000) and Goldberg & Jackendoff (2004: 561) claim that the verb *burn* prefers to combine with the prepositional phrase *to death* because it cannot normally encode an instantaneous result. Nevertheless, our example *The flame burnt dead* highlights that the flame instantly goes out. What is more, the syntactic position of the end-result in the adjectival resultative iconically signals ‘lack of distance’ and ‘immediacy’ (in the temporal sense). In harmony with this iconic motivation, the adjectival phrase resultative *dead* gives more prominence to the resultant state, whereas the prepositional phrase resultative focalizes the process that leads to a result.

The same reasoning could be applied to the following sentences: [...] *Our stalks wither brown* (Sketch engine doc#497205) and *The grass had withered to an unappealing brown* [...] (COCA 1989). Both examples are based on the A>A' schema, since they illustrate a color change of the affected entity. The prepositional resultative hints at a longer process of withering than its adjectival counterpart. Or the syntactic distance between the verb and its result can be motivated by the interposing adjectival modifier *unappealing*, which is a subjective remark made by the speaker. So, with these examples we have demonstrated that the A>B schema is not necessarily linked to a prepositional resultative (cf. *The flame burnt dead*) and that the A>A' schema can also be represented by a prepositional resultative (cf. *The grass had withered to an unappealing brown*).

A close inspection of the syntactic distribution of the verbs of the second group reveals that non-existence is perceived as a container into which the affected entity enters through figurative motion:

- (18) a. *Today, when the sovereignty of nation-states around the world is being corroded into virtual nothingness by the acids of "free trade," "globalization," and so-called "world rule of law," why should any government which accepts such trends, ask us to believe the sincerity [...]* (Sketch engine doc#2373935)
- b. [...] *the society, once consisting of many hundred members, was moldered into nothing* (Sketch engine doc#1789406)
- c. *So instead of heating the fritters and the bacon, they whacked the entire plate in the microwave and the spinach wilted into nothing* (Sketch engine doc#983353)

d. *The naval pachyderms [...] withered out of existence in a few years by the appearance of the fragile but lethal carrier-borne aeroplane* (Sketch engine doc#661375)

e. *So how interesting that the Karaites, the reason we don't hear of them is that they withered out of history, they are utterly obscure* (Sketch enginedoc#979411)

Literal (in 18c) or figurative decomposition (in 18a, b) of an entity is metaphorically described as motion into the state/container of being 'completely destroyed' (A>B schema) on the basis of the low-level metaphor ABSTRACT ENTITIES ARE CONTAINERS in conjunction with A CHANGE OF STATE IS A CHANGE OF LOCATION. Examples (18)(a)-(e) clearly illustrate that not only extinction but also life/existence is viewed as a container and absence of life is depicted as motion out of a container. In (18e) the gradual disappearance of the Jewish sect, i.e. the Karaites, from collective memory (*history*) is seen as figurative motion out of a container.

The fusion of verbs of the second group and the intransitive resultative construction is regulated by the Internal Variable Conditioning constraint, which states that the internal semantic make-up of a predicate restricts the nature of its constructional arguments. All verbs of the second group describe negative changes of state affecting the integrity of an undergoer. Because of this, there is a tendency for the Z element to be axiologically negative, as can be noticed in the examples below:

- (19) a. *Of course our ethnic, national, religious traditions are a source of rootedness, identity, and community. But not when it ceases to be a matter of honest pride and corrodes into divisiveness and bitterness* (Sketch engine doc#827042)

b. *These discussions, decaying into dissension, strangely arouse Tilly [...]*

(Sketch engine doc#62924)

c. *The Taliban saw as their mission the purification of the Islamic holy war*

which had decayed into anarchy in Afghanistan (Sketch engine doc#639513)

d. *[...] it does not take long for the marvel to deteriorate to disenchantment*

(Sketch engine doc#919860)

e. *Over time, once fit emotional and physical states may deteriorate to*

illness and disease (Sketch engine doc#813417)

The verb *deteriorate*, which indicates a state of regression, can be contrasted with *blossom*, which describes a state of development of an entity. Compare the sentence *Their relationship blossomed into marriage* with *Their relationship deteriorated into divorce*. In both sentences the relationship is conceptualized as figuratively entering into a state/container (e.g. the state of being married or single) but the manner of achieving motion is different in each case, i.e. in the first sentence motion is positively loaded whereas in the second one motion has negative connotations. An utterance like **Their relationship deteriorated into marriage* is blocked out by the Internal Variable Conditioning constraint according to which the nature of the Z element must be consistent with the negative semantic make-up of the verb.⁷⁴

The figurative sentence *High expectations raised by the changes in the political and economic system as well as by the independence of Slovenia have gradually eroded to the general disappointment* (Sketch engine doc#642595) is an instantiation of a

⁷⁴ In any event, this utterance would be possible as an ironical utterance based on the fact that marriage preserves a default positive axiology.

double-source metaphoric amalgam, which is schematically represented in Table 4.7 below:⁷⁵

Source \Rightarrow (natural process of erosion)	Target (change of state)	\Leftarrow Source (change of location)
High landform	High expectations	Source
Erode	Process (degradation)	Motion
Low landform	Result (disappointment)	Destination

Table 4.7 *High expectations [...] eroded to the general disappointment*

Our sentence is enriched by two interacting low-level metaphors A (NEGATIVE) CHANGE OF STATE (OF AN ABSTRACT ENTITY) IS EROSION and A CHANGE OF STATE IS A CHANGE OF LOCATION. The change from enthusiastic feelings to a state of disappointment is seen as self-instigated motion from a source to a destination, where the source overlaps with the subject referent and the resultant state is mapped onto the destination of motion. The gradual decline of expectations is metaphorically interpreted in terms of a geological process whereby the soil is worn away by the action of water and wind. The external agents acting on the earth's surface such as the water and the wind could also be mapped onto possible events that might have provoked the degradation of feelings. Following the logic of the Internal Variable Conditioning constraint, the conceptual information encapsulated by the verb (i.e. an entity changes to something smaller and lower) clashes with Z elements that are bigger or higher than the Y element (cf. **The hill eroded to a mountain/*The rocks eroded to mountains*).

It has been stated earlier that the intransitive resultative can take the form of a combined adjectival and prepositional phrase as in *I shut my eyes and that torrid sunbeam burned red through my lids* (Sketch engine doc#42765). This sentence conveys the idea that the speaker has his/her eyes closed and that the strong sunlight

⁷⁵ The expression *high expectations* also exploits the primary metaphor GOOD IS UP, thus giving rise to the idea that the expectations are very positive.

passes through his/her eyelids making him/her see red. It is very surprising to notice that the event structure configuration of the sentence does not match the actual temporal arrangement of events in the real world since the result of the action (the visual effect of redness) is expressed prior to the motion event that causes such a result (the sunbeam going “through” the speaker’s “eyelids”).

The last syntactic possibility of an intransitive resultative construction is a combination between an adverb and a prepositional phrase such as *In this manner their fundamental teachings have been preserved in their style up to the present, instead of withering away into the empty formulas of scholasticism* (Sketch engine doc#1658416). This sentence is another case of double-source metaphoric amalgam which inherits conceptual information from two distinct metaphors. The first one enables us to perceive the decline in conceptual depth of a philosophical theory in terms of the withering of a plant. The second one equates the negative change undergone by the teachings (from more to less conceptual depth) with motion from a source to a destination point which corresponds with the resultant entity *empty formulas of scholasticism*. In the real world result is inextricably linked to a change of position: the verb *wither* encodes information about the state of dryness of a plant and its change of position, i.e. the plant bends downward. This combined adverb and prepositional phrase complies with Goldberg’s (1991b) Unique Change of State constraint in the sense that the prepositional phrase adds telicity to an unbounded process (withering) by specifying the final destination of the path suggested by *away*. This adverb and its related prepositional complex *away from*, which usually indicate spatial separation between two entities (e.g. *He ran away from the wolf*), reinforce the negativity of a result by means of motion away from a state of greater conceptual depth.

We would also like to underscore the versatility of the English language which easily conflates result and motion and that is why sometimes it is difficult to distinguish a purely intransitive resultative construction from an intransitive motion construction. To illustrate this idea consider the sentence *In June, their ballpark caught fire during a game and burned to the ground* (Sketch engine doc#3106). This utterance can be regarded as an intransitive resultative construction which exploits non-caused motion on the basis of the primary metaphor STATES ARE LOCATIONS. Here a decrease in size of the stadium correlates with downward motion on a vertical scale (LESS IS DOWN metaphor). The decrease in size and the downward motion occur simultaneously but speakers are free to decide what to give more conceptual prominence to, i.e. to the resultant state (e.g. *The ballpark burned to ashes*) or to the change of position on the scale (e.g. *The ballpark burned to the ground*).

The sentence [...] *the laser burns through the black layer of a two-part foil, [...]* (Sketch engine doc#104685) is another piece of evidence supporting the existence of a fuzzy boundary between an intransitive resultative and an intransitive motion construction. In this example the motion of the laser beam, which pierces the foil, becomes more salient than the resultative component, namely the creation of a hole in a material (cf. *The laser burned a hole through the foil*). At this stage it is important to point out Evans & Tyler's (2004) position on the preposition *through*. These authors deny the motional meaning supplied by this preposition, which in their view uniquely codes path. Their example *The tunnel through Vale Mountain was finished in the 1980s* seems to fit perfectly their argumentative line because it conveys the notion of facilitation of passage independent of motion or trajectory. However, in this sentence there is fictive motion (cf. Talmy 2000), which is based on our experience of scanning with our eyes (or with our minds in a mental simulation of what we do in our

experience) the path of motion in the context of a three-dimensional entity. The same holds true for examples like *The road from Madrid to Barcelona* (which is a verb-less version of *The road that runs from Madrid to Barcelona*). Their hypothesis is contradictory when it comes to the discussion of an utterance like *The sunlight shone through the glass door* which is believed to lack perceptible motion. The notion of PATH, which is cued by the preposition *through*, strongly correlates with the idea of the TR physically passing or having passed from one side of the LM to the other. This is not acceptable in view of the fact that the sunrays literally go through the glass door. Is it reasonable to exclusively make a verb responsible for the motional meaning of a sentence? We believe it is incongruent to state that the preposition *through* solely codifies a path with no motion attached to it.

Other verbs that blend the resultative and the motional components are *erode*, *molder*, *rot*, *rust*, and *wilt*, as demonstrated by the occurrences displayed in (20)(a)-(e):

- (20) a. *All continents would erode out to sea in a geologically short time, if continuous upwelling of new rock from below did not keep replenishing them* (Sketch engine doc#2114585)
- b. *A man's body, once life had left it, was no more than any other carcass, moldering back into the soil which once produced it* (Sketch engine doc#2321751)
- c. *All the enamel rotted off his teeth [...]* (Sketch engine doc#41900)
- d. *We won't talk about how many books were ruined when my hot water heater rusted out and flooded the house* (Sketch engine doc#1249281)

e. *Stir in the basil leaves at this stage - they'll wilt into the sauce but not lose their flavor* (Sketch engine doc#2123629)

In the examples above we can clearly see how the prepositional phrase or the motion/location adverb conflate the path of motion and the result of an action, whereas the verb conflates manner of motion and manner of action. In (20a) the gradual disappearance of land is what brings the continents physically closer to the sea, which is the final destination of motion and the result. The adverb *out* in (20d) indicates motion of the hot water out of a container (the heater) and this is facilitated by the rusting process. The remains of the human body in (20b) or the basil leaves in (20e) are incorporated into the soil and the sauce once the final stage of the moldering and correspondingly wilting process (i.e. the result) is reached. Therefore, the attainment of a result coincides with the final destination of motion.

The conflation between result and motion is also made explicit in resultative constructions which are based on caused-motion syntax.⁷⁶ Take for instance the sentence *You must decide to get your body mobile and limber, and exercise it, to burn off the excess fat [...]* (Sketch engine doc#14083). The spatial adverb *off* stresses that two entities are no longer attached or connected (e.g. *He shaved off his beard* implies that when the action of shaving is completed he is beardless). In our case the speaker becomes slimmer (result) by removing the excess from his body, i.e. the speaker (X) figuratively causes the excess fat (Y) to move away from his body (Z) by exercising (burning).

⁷⁶ The sentence *The sweat ran down his face, streaking it and wilting his collar flat* (Sketch engine doc#231181) is the only instantiation of a canonical resultative construction which was found in our database. The end-result of the affected entity refers exclusively to a change of shape and does not emphasize the motional component of the change of state.

Another sentence which exploits the intricate connection between result and motion is [...] *the Taliban burned down the school* [...] (Sketch engine doc#11246). The adverb *down* is employed in order to suggest a simultaneous change of state and position on a scale (the building changes from an erect position to a demolished state). Once again, the combination between the adverb and the object (*down the school*) serves a twofold purpose: to express the path of motion followed by an undergoer (the school) and the result of the action exerted by an agent. In its turn the verb codes manner of motion and action. In a similar fashion, the verb *wither* combines both result and motion in a resultative construction like *He [Jesus] withered it [the fig tree] down* (Sketch engine doc#1827612). The adverb *down* encodes a change from an upright position to a fallen posture caused by a change of state.

Likewise, verbs like *erode* or *molt* give compelling evidence for the inseparability between the resultative and motional components. Compare the sentence [...] *the water topped the levee and then eroded it out* [...] (Sketch engine doc#542275) with *The Exmoor pony molts out this winter coat* [...] (Sketch engine doc#545181). In the first sentence the water gradually grinds the levee which ultimately allows the water to move out of the dam. In the second sentence the adverb *out* also indicates a physical separation between two entities, viz. between the skin of the pony and the fur which falls off its body, and a result of this physical separation, i.e. the pony is hairless. Moreover, the Predicate Argument Conditioning constraint explains why once the predicate and prepositional/adverbial slot have been filled in, the Y element must be realized by a specific kind of entity. The unification between the verb *burn* and the adverb *down* requires a specific kind of affected entity, namely a building (e.g. *They burned down the school*) or a location containing entities in a vertical position (e.g. *They burned down the village* vs. *?They burned down the dessert*). A human object

would yield the sentence ungrammatical even if the death of human beings might be implied when a village is burned to the ground (cf. **They burned down the president*). The same requirement must be met for the unification process between the verb *molt* and the adverb *out*. The Y element must necessarily be a bodily covering (e.g. *The animal molted out its skin/hair/exoskeleton/shell*) but never a body part (cf. **The animal molted out its head/paws* vs. *The bird molted out its wing/tail feathers*). Moreover, the Event Identification Condition constraint is operative in a resultative construction like *The man burned them to death*, in which the verbal subevent can only encode the closest temporal subevent to the resultant state. Verbs such as *kindle* or *incinerate*, which focus on the initial sequence in the causal chain (i.e. the entity is caused to start burning) and the final sequence (i.e. the entity is completely destroyed), respectively, are incompatible with this prepositional resultative construction (cf. **The man kindled them to death/*The man incinerated them to death*).

We consider that a resultative based on a caused-motion syntax can form a metaphorical complex, also called high-level metaphoric chain (cf. Peña 2009). Take for instance the sentence illustrated in (21):

- (21) *The Prime Minister and Presidents along with their most senior Cabinet members and officials really now do apply a "Divine Right of Kings" mentality to their role. They have metamorphosed into a cancer rotting the life out of our democracies (Sketch engine doc#1115009)*

For a better understanding of such an utterance we shall first point out the low-level mappings. Thus, country rulers are seen as a cancer that renders a human body lifeless, where the human body maps onto the country. Life (an abstract entity) is perceived as a concrete substance located in a container. The rulers are the agents that take life (the

substance) out of democracy (the container). Very likely, democracy is metonymic for democratic country (or country that has chosen democracy as its form of government), so the container would in fact be the country. The low-level metaphor ABSTRACT ENTITIES ARE CONTAINERS enables us to perceive an abstract concept such as democracy as a container. The last low-level metaphor operating in this sentence would be CAUSES ARE FORCES, where the actions of country rulers are regarded as a force that acts upon another entity. The subsumption of the verb *rot* into this resultative construction is licensed by a metaphorical complex made up of two parts: (1) AN EFFECTUAL ACTION IS CAUSED MOTION, and (2) GETTING RID OF A PROPERTY IS GETTING RID OF A MOVING OBJECT. Life-as-a-substance is mapped onto a property of democratic countries: the life of a democracy is whatever is essential to democracy (e.g. people being actually able to choose in freedom).

As stated in section 4.1.1, the causative construction is integrated into the resultative and caused-motion constructions by means of a so-called constructional amalgam (cf. Ruiz de Mendoza & González 2011). For example, the verb *rot* is first subsumed into the causative construction (e.g. *That candy will rot your teeth*), thus depicting an inanimate entity (candy) acting upon another entity (teeth) and causing its decomposition. Next the causative construction is integrated into the resultative construction involving motion, as in *That candy will rot your teeth out!* (Sketch engine doc#1662962). This utterance blends the resultative component (the teeth are rotten) with the motional one (the teeth move out of the speaker's mouth by falling). Also, according to the Lexical Blocking constraint the verb *rot* cannot select an adjectival phrase expressing the same end-result as in **That candy will rot your teeth rotten*.

All the verbs of the second group can participate in the causative configuration, which can have either a literal or a figurative meaning, as evidenced respectively by the two groups of examples below:

(22) a. *Perfumes can corrode many plastics over time, [...]* (Sketch engine doc#67640)

b. *The steam deteriorated the glass, [...]* (Sketch engine doc#125533)

c. *Drought wilted Illinois crops* (Sketch engine doc#498295)

d. *[...] a fungus is edible if it peels readily and does not tarnish a silver spoon when cooked with it [...]* (Sketch engine doc#125954)

e. *The vessels of our bodies [...] would stagnate the blood to the very heart* (Sketch engine doc#637789)

(23) a. *Trial by fire can refine us, or it can coarsen us. It can corrode our ideals and erode our freedom* (Sketch engine doc#172288)

b. *Time molders all idols in the dust, but God is not subject to time* (Sketch engine doc#699547)

Even a verb like *molt*, which describes an inherent process undergone by an animal, can be transitivized, as can be demonstrated by its passive use, e.g. *[...] the idea here is to compare the indigenous microbial response in crops of birds that have been molted either by feed deprivation or using the moderate Zn diet approach* (Sketch engine doc#2358729). The verb *molt* can also be transitivized in a metaphorical use as in *It [...] tunneled the soil and molted the bushes* (Sketch engine doc#1037664). In the

context of this sentence an entity (probably an animal) causes the bushes to lose their leaves as if by molting.

Just like verbs of the first group, verbs of the second group can appear in the intransitive causal construction but causality is realized this time by a richer prepositional gamut. In sections 4.1.1 and 4.2.2, verbs of the first group were shown to occur with causal prepositions like *in* and *with*. Unsurprisingly, verbs of the second group follow a similar pattern, e.g. [...] *he cruelly left me behind when he set off to seek a life of adventure, leaving me behind to stagnate in misery* (Sketch engine doc#253878); *"Shout at the Devil" and "Home Sweet Home" have not tarnished with age, perhaps because the appeal of these songs is so primal* (Sketch engine doc#290735). In the first sentence the preposition *in* conflates the cause of cessation of progress with a state which is seen as a container on the basis of the primary metaphor STATES ARE LOCATIONS. The second sentence implies that time can destroy the appeal of songs. Sometimes the intransitive causal configuration can mix with a resultative construction (e.g. *The enclosure had been so full of kerosene vapor, that it burned black with noxious fumes*; Sketch engine doc#171747, where the poisonous smoke produced by burning causes the enclosure to acquire a black color) or a causative pattern (e.g. *Do not tarnish your badge with a stain of corruption*; Sketch engine doc#244525, in which the noun *badge* metonymically stands for the reputation of a person wearing the badge; the implicature is that corruption or corrupt actions can destroy a person's reputation). Causality can also be activated by the preposition *from* as seen in the sentences [...] *the entire structure [the military] is deteriorating from neglect - morale at all levels appears dismal* (Sketch engine doc#638341) and *But bells now rust from inactivity* (Sketch engine doc#1045093). The low-level metaphor STATES ARE LOCATIONS enable us to perceive a state of neglect and inactivity,

respectively, as the starting point of a path. The gradual degradation of the military system, in the first example, and the bells, in the second example, are conceived as motion along a path which is cued by its point of departure. Last, the preposition *under* can be associated with causality as in *Less-sturdy pans might wilt under excessive heat [...] (Sketch engine doc#1292335)*. This preposition, which highlights a lower spatial position of an entity with respect to another one, hints at the fact that the heat oppresses and acts upon the pan in a damaging way.

Ten verbs of the second group were found to collocate with the *way* construction:

(24) a. *Her hand shook as she lifted the glass to her lips, and, unused to spirits, she coughed as the fiery liquor burnt its way down her throat (COCA 1992)*

b. *[...] the salty water corroded its way through the casing of the wells⁷⁷*

c. *His growing dislike for atheism parallels his increasing doubts about the French Revolution as it decayed its way through the Directory and towards Napoleon⁷⁸*

d. *There, despite the lying snow, conditions had almost been mild, with minimal wind and the constant, spring like gurgle of the burn eroding its way through the snowbanks (Sketch engine doc#16778)*

e. *[...] communism, its great challenger, moldered its way to comprehensive failure throughout the Eastern bloc⁷⁹*

⁷⁷ Google Books: *Geology of the Tertiary and Quaternary periods in the north-west part of Peru*, by Thomas Owen Bosworth (1922). Accessed on May 3, 2012.

⁷⁸ Google Books: *Weapons of criticism: Marxism in America and the literary tradition*, by Norman Rudich (1976). Accessed on May 3, 2012.

⁷⁹ Google Books: *The Conservatives: Ideas and Personalities Throughout American History*, by Patrick Allitt (2009). Accessed on May 3, 2012.

f. *The encyrtid egg does not hatch until after the caterpillar has eaten and molted its way into its last instar*⁸⁰

g. *The water sits on the battery tray at the side of the engine and eventually rots its way out - through the rear corner taking the battery tray with it*
(Sketch engine doc#479236)

h. *Steel-hooped wooden pipes the old watermen call “galleries” rusted and rotted their way down the canyon*⁸¹

i. *Polk County has wilted its way into the dry season, setting up the annual conflict between water conservation and the need to irrigate plants and lawns*⁸²

j. *Other flowers [...] fade, droop and wither their way out of life*⁸³

All these examples should be divided into two groups depending on the type of path they encode, i.e. either literal (e.g. 24a, b, d, g, h) or metaphorical (e.g. 24c, e, f, i, j). The first group describes the motion of a liquid in (24a), of the water in (24b, g), of the wind in (24d), and of the pipes in (24h) along the path described by the prepositional phrase. The metaphorical path entailed by the second group of examples is non-pre-established and refers to the manner in which a (concrete/abstract) entity evolves through time. For example in (24c) temporal evolution of an ideological movement (viz. the loss of momentum and destruction of the French Revolution) is conceived in terms of motion through a series of contiguous points (e.g. the Directory and the Napoleonic

⁸⁰ Google Books: *One hundred butterflies and moths*, by Jeff C. Miller, Daniel H. Janzen, Winifred Hallwachs (2007). Accessed on May 3, 2012.

⁸¹ Google Books: *Chasing Monarchs: Migrating with Butterflies of Passage*, by Robert Michael Pyle (2001). Accessed on May 3, 2012.

⁸² Google Books: *Lakeland Ledger* newspaper (1992). Accessed on May 3, 2012.

⁸³ Google Books: *Life and other punctures*, by Eleanor Bron (1978). Accessed on May 3, 2012.

era). Since the partisans of this movement do not want its disintegration we cannot conceptualize the different stages of the French Revolution as external obstacles that impede its disappearance. This example is another instantiation of a double-source metaphoric amalgam which combines two low-level metaphors, i.e. A (NEGATIVE) CHANGE OF STATE (OF AN ABSTRACT ENTITY) IS DECOMPOSITION and A CHANGE OF STATE IS A CHANGE OF LOCATION, as can be seen in Table 4.8:

Source \Rightarrow (natural process of decomposition)	Target (change of state)	\Leftarrow Source (change of location)
Organic matter	French Revolution	Source
Decaying	Disintegration of the movement	Motion
Stages of decomposition	The Directory	Points on a trajectory
Destruction of organic matter	Result (disappearance of the ideological movement)	Destination of motion

Table 4.8 [...] *the French Revolution [...] decayed its way through the Directory and towards Napoleon*

The same holds true for (24e) in which the resultant stage of evolution of communism (e.g. failure) is conceived as the destination of motion of a concrete entity. The developmental stages of a caterpillar in (24f) and the transition from a warmer into a drier season in (24i) make up a figurative non-pre-established trajectory with no impediments. Also, the process of extinction of a plant in (24j) is viewed as self-instigated motion out of a container.

Contrary to Goldberg's (1996) semantic prescriptions for this construction, the subject referent in (24a) clearly demonstrates that the path (her throat) is pre-established and not created by the action performed by the subject. The presence of a pre-established path also implies that no barriers or obstacles are involved, i.e. when someone drinks, the liquid simply falls down his throat going directly to his stomach. The burning sensation that is experienced in the chest/throat when one drinks spirits is emphasized here by means of the *way* construction which links a series of contiguous

points through which motion occurs. Also, in (24h) the precipice of the canyon is another example of a pre-established path whose creation precedes the fall of the wooden pipes into it. In examples (24b), (24d), and (24g) the path of motion is non-pre-established and the subject referent moves despite external impediments such as the outer cover of a container, heaps of snow or the walls of the battery assembly. These change-of-state verbs elaborate the means of achieving motion by pointing out that a path must be created through a natural process of corrosion, erosion or decomposition.

Finally, the verb *ferment* belongs to a third group due to its distinct semantic features, i.e. it does not involve any increase or decrease in size of an entity and the change is neither positive nor negative. As far as its syntactic behavior is concerned, it must be added that this verb patterns with the other change-of-state verbs. It can take part in the intransitive locative construction, indicating either a literal location (e.g. *When eaten one after another fruits ferment in the stomach while waiting for other foods to digest*; Sketch engine doc#100405) or a metaphorical location (e.g. *A revolution was fermenting in men's minds [...]*; Sketch engine doc#113036). The verb *ferment* is quite productive in the intransitive resultative and resultative constructions. The end-result of the fermentation process can be literal as in *[...] grapes can ferment into wine* (Sketch engine doc#798799) or figurative as in *The minds of men [...] will never ferment into any knowledge valuable or durable* (Sketch engine doc#1218768). The verb *ferment* thus follows the A>A' schema in the sense that the entity undergoing fermentation still preserves its integrity. For example, wine that ferments into vinegar changes into a different substance although it still preserves many of its original properties, including the fact that vinegar, like wine, is a liquid. The resultant entity can be conceived either as a container (e.g. *Rather than fermenting food crops into ethanol, [...]*; Sketch engine doc#114070) or the final point on a path through the metaphor

CHANGES OF STATE ARE CHANGES OF LOCATION (e.g. *The yeasts ferment* the sugars to ethanol; Sketch engine doc#134125). This verb also happens in the intransitive causal construction headed by a *with* preposition that conflates causality and instrumentality (e.g. *She was still fermenting with anger, and furious at his intervention*; Sketch engine doc#2321751, where a negative emotion causes a state of agitation in a human agent).

4.2.3.3. Emotional and non-emotional causality with entity-specific change-of-state verbs

Radden (1998) analyzes emotional causality in terms of four different image-schemas, namely containment (e.g. *She trembled in fear*), companionship (e.g. *She was stiff with anger*), front-back (e.g. *She cried for joy*),⁸⁴ and emergence (e.g. *She cried out of pride*). In this section only the first two schemas will be revised. Some entity-specific change-of-state verbs were shown to participate in both emotional and non-emotional causal constructions. Consider the example *The president's face wilted* in confusion and bewilderment (Sketch engine doc#1300889). Following Radden's (1998) line of argumentation, it could be argued that in this sentence the emotion of confusion is conceptualized as a container which triggers the undergoer's physiological reaction of drooping. The emotions that collocate with *in*-phrases are intense and predominantly negative (e.g. *in fear, in anger, in fury, in terror*).⁸⁵ Nevertheless, we have come across a corpus example which makes use of a positive causal emotion, namely [...] *it will certainly give cause to our Christian readers to swell* their chests out in pride (Sketch

⁸⁴ An emotion and its response are aligned along a front-back axis, where the response occupies the front-region and the emotion is located in the back-region.

⁸⁵ Radden also claims that less intense emotional states are ruled out (cf. **in worry, *in sadness, *in shame*).

engine doc#1783987). According to Radden (1998: 276) all these properties stem from the logic of the container schema. Thus, the experiencer of an intense overpowering emotion feels as if he were held in a container which prevents him from moving around freely. *In*-phrases can be narrowed down to two conceptual metaphors, i.e. INTENSIVE EMOTIONS ARE CONTAINERS (e.g. *I trembled in terror*) and EXTERNAL CIRCUMSTANCES ARE CONTAINERS (e.g. [...] *the petunias wilt in the heat* [...]); Sketch engine doc#157642). However, we wonder how Radden (1998) would account for an example that was mentioned in section 4.1.1, i.e. *The camera blossomed in the hands of indigenous photographers* [...]: probably by postulating another conceptual metaphor, CAUSES ARE CONTAINERS. Instead of formulating another metaphor, the LCM contends that the human mind moves along a conflational continuum:

location in a container> possession of object> instrumentality> causation

Emotions can also be involved in causal chains as in *The little cats have six toes and no tails to swell out in fury at the sight of a dog* (Sketch engine doc#49242). In this example *the sight of a dog* can be seen as the stimulus that triggers the fury of the cat, which in turn causes the physiological reaction of swelling.

Regarding the preposition *with*, Dirven (1993: 81; 1995: 101) claims that it has a basic spatial ‘accompaniment’ meaning (e.g. [...] *he was walking with two Jewish policemen* [...]; Sketch engine doc#23425) and four other metaphorical extensions, namely ‘instrument’ (e.g. *We cut grass with a ride-on mower* [...]; COCA 1991), ‘manner’ (e.g. *I listened with great care* [...]; COCA 1991-1992), ‘circumstance’ (e.g. *I canna "hear it with this watter runnin'*; COCA 1989), and ‘cause’ (e.g. *She was shaking with fear*; COCA 1990). Radden (1998: 279) lists two other usages for this preposition, viz. ‘possession’ (e.g. *It was the man with a moustache*), and ‘attendant emotion’, which

overlaps with Dirven's (1993, 1995) 'cause' meaning. In a similar vein, Radden (1998) interprets these other usages as metaphorical extensions of the overall metaphor ASSOCIATED ENTITIES ARE COMPANIONS.

Cuyckens (2002: 259) strongly disagrees with Dirven's (1993, 1995) metaphorical treatment of the preposition *with*. Take for instance the sentence *With the development of computer-based resources, many schools are now able to offer a full computer-across-the-curri approach to teaching* (COCA 1993). According to Cuyckens's reasoning, this example cannot be licensed by the metaphor CAUSE IS CIRCUMSTANCE because the notion 'circumstance' and 'cause' are not two separate discrete domains, but rather they are part of the same event ICM. For him these two domains hold a conceptual contiguity relationship captured by the metonymy CIRCUMSTANCE FOR CAUSE. Furthermore, Radden (1998: 282) argues that the metonymy AN EMOTIONAL STATE FOR THE CAUSE ORIGINATING FROM THAT STATE uses the companion schema because of a strong connection between a given emotion and its physiological reaction. The LCM distances itself from these views since it accounts for the usages of this preposition by a conflationary continuum as was the case with the analysis given above for the metaphorical use of the preposition *in*:

company> possession of object> instrumentality> causation<effect

Thus, being in company of an entity facilitates using that entity. Having an instrument enables people to perform actions, i.e. to cause events to happen. It is true that the relations between these domains are metonymic but not in the contiguous sense evoked by Cuyckens. Just like the preposition *in*, *with* can be found in a double causal chain as in *Amman is burning with anger at the United States and its threats against Iraq* (Sketch

engine doc#1235974), where the threats of the USA trigger the experiencer's anger, which in turn causes the physiological reaction metaphorically described as burning. The expression of cause can be linked to a resultant state as in *He has those cartoonish dark eyes that burn* bright with obsession and self-absorption (Sketch engine doc#25160). As has been demonstrated in the previous sections, the preposition *with* can collocate not only with emotional causes but also with non-emotional causes (e.g. [...] *utensils tarnished* with frequent domestic service; Sketch engine doc#904287).

4.2.4. Onomasiological arrangement for entity-specific change-of-state verbs

The close inspection of the conceptual links between verbs and their complementation patterns bears out both Levin's (1993) and Faber & Mairal's (1999) contention that the internal semantic parameters of a verb function as important predictors of its range of syntactic representations.

In order to build onomasiological hierarchies for the class of entity-specific change-of-state verbs, we have factorized out the meaning elements that they have in common. This process is the result of directly observing the semantic and syntactic behavior of predicates in their contexts of use. Factorization refers to finding common definitional structures between related lexical items and then deriving a higher-level structure, which applies to items in the lower domains. The result is the elaboration of a hierarchy of hyponyms and hyperonymic concepts. Since the hypernyms are more generic, each hyponym inherits the nuclear meaning from its superordinate structure, but at the same time has a set of properties that distinguishes it from the rest of the lexical items found at the same level. In what follows we describe the steps that we have taken in the elaboration of onomasiological hierarchies of predicates. Thus, we started

by looking up the definition of each and every verb in the dictionary in order to compare the similarities between their corresponding complementation patterns and argument structure. Since definitions of dictionaries are usually very brief, the information from a single dictionary is not sufficient for the identification of shared meaning components. Hence, it was absolutely indispensable to consult several of the most widely used monolingual dictionaries, such as the *Longman Dictionary Online*, the *Cambridge Dictionary Online*, and the *OneLook Dictionary*. We also made use of dictionaries of synonyms (e.g. *Multiwordnet*, *Wordreference*, the *Collins thesaurus*). Our aim was to create a hierarchy of hyponyms and that is why we began with the hyperonymic concepts and we searched their immediate synonyms. For the accuracy of these definitions, two main components were taken into consideration: (i) the nuclear meaning or act nucleus (viz. the *genus/definiens*, written in bold), and (ii) the modificants, which represent a set of idiosyncratic properties (viz. modifying adverbials: specificity of the transferred entity, formality, purpose, etc., the lexical units between brackets) (cf. also Snell-Hornby 1983, cited in Boas 2008b). For the sake of illustration consider the examples beneath:

change to become or cause to become different

increase to change by becoming [greater in size/number/intensity]

grow to increase in [size] by [a natural process]

develop to grow [by degrees] into [a more advanced or mature state]

bloom to develop [flowers]

blossom to develop [flowers]

flower to develop [flowers]

sprout to develop [leaves/shoots]

germinate to develop [buds/branches]

As can be observed, all these verbs have *change* as their genus and the descriptive parameters in their definitional structure refer to manner, the specificity of the change and the resulting entity. In the previous sections we have analyzed the syntactic behavior of several hyponyms in this hierarchy, namely *bloom*, *blossom*, *flower*, *sprout*, and *germinate*. According to Levin (1993) and Faber & Mairal (1999) in a hierarchy of predicates the hyponyms show a tendency to display the same syntactic configuration as their genus or superordinate predicate. If their predictions are true, then the superordinate predicates, i.e. *develop*, *grow*, and *increase*, and their genus *change* have to share more the same syntactic representations as the lower-level predicates (e.g. *bloom*, *blossom*, *flower*, *sprout*, *germinate*). All lower-level predicates were shown to participate in the intransitive resultative construction. Thus, the more generic predicates are also expected to combine with this configuration:

- (25) a. [...] *the water changed into mud* [...] (Sketch engine doc#6866)
- b. *A breeze sprung up which increased into a gale* (Sketch engine doc#637864)
- c. *The two sweet cubs had grown into big strong lions* (Sketch engine doc#6866)
- d. *Once the brain develops to maturity, it becomes more adept at handling slower speeds* (Sketch engine doc#1330743)

Also, even if only a small number of lower-level predicates was found to collocate with a given construction, the higher-order predicates are always expected to fuse with that

particular construction, since their semantic make-up is more generic and thus, more malleable from a syntactic point of view. For example, higher-order predicates should be more productive in the resultative construction than the lower-level predicates:

- (26) a. *At 7, he changed his name to Leaf, supposedly while raking leaves with his father* (Sketch engine doc#1626)
- b. *However, international tuna prices increased in 2007, thereby increasing export earnings to about \$100 million* (Sketch engine doc#1591)
- c. *The supply-siders say we can grow the economy out of debt [...]* (Sketch engine doc#625584)
- d. *They had to try and develop some order out of chaos-and all at the last minute* (Sketch engine doc#618819)

The verbs *swell* and *blister*, which were subsumed in the first group together with *bloom*, *blossom*, *flower*, *sprout*, and *germinate*, inherit their syntactic behavior directly from the verbs *increase* and *change* respectively, because they do not refer to natural processes of growth:

change to become or cause to become different

increase to change by becoming [greater in size/number/intensity]

swell to increase in size/volume as [a result of internal pressure]

blister [skin/surface] swell [because it is full of liquid/air]

The verbs in the second group also have *change* as their most generic superordinate predicate, but they also depend on *decrease* and *decay*, as illustrated by the following lexematic arrangement:

change to become or cause to become different

decrease to change by becoming [smaller in size/number/intensity]

decay to decrease [gradually] [in size/quantity/activity/force]

rot to decay [from the action of bacteria or fungi]

corrode to decay [by oxidation or chemical action]

rust to decay [by rust formation]

tarnish to decay [by losing color and becoming less shiny]

molt to decay [by losing a bodily covering]

erode to decay [the surface of land/rock] by [abrasion]

deteriorate to decay [by wearing away]

burn to decay [a substance] by [fire]

wilt [plants] decay [by losing turgor] [from lack of water]

wither [plants] decay [by drying]

crumble to decay into [small fragments or particles]

molder to crumble [to dust]

Again, the more generic predicate *decrease* should collocate with the intransitive resultative and resultative constructions given the fact that its more specific hyponyms do display this syntactic behavior:

(27) a. *Churwell's sneer decreased into a frown, and his brow furrowed* (Sketch engine doc#293418)

b. *As a result, smokers [...] decreased their smoking to as little as one to three cigarettes per day [...]* (Sketch engine doc#17173)

Also, in the previous hierarchy, we could notice that *molder* is a hyponym of *crumble*, which refers to the decomposition of entities into small fragments and particles. As

such, *crumble* should share the same syntactic representation as *molder*, i.e. it must participate in the intransitive resultative construction (e.g. *I calmed the little one, and then sat there beside her bed, staring before me as my world crumbled into ashes*; Sketch engine doc#81932).

Lastly, the verb *ferment* is different from the verbs classified above since it does not denote an increase or a decrease in size. *Ferment* is hyponym of the neutral verb *convert*, which in its turn inherits from *change*:

change to become or cause to become different

convert to change sth. into [another form/substance/state/product]

ferment to convert [by fermentation]

Therefore, the verb *convert* must participate in the intransitive resultative (cf. [...] *the utopia has converted into a sweet reality*; Sketch engine doc#748032) as well as the resultative construction (cf. *When you convert your money to local currency, retain receipts*; Sketch engine doc#4159).

4.3. The ditransitive and the dative constructions

This section will be devoted to the examination of Levin's (1993) *contribute* verbs and their distributional patterns, namely their (non-)participation in the *dative alternation*. Before focusing on the principles that license or block out their lexical-constructional subsumption, we would like to provide readers with a brief overview of this constructional phenomenon. The dative alternation (also termed 'dative shift') is made up of 'internal' versus 'external' dative (Wierzbicka 1988) or a dative realized by double objects [NP/SUBJ [VP/PRED NP/OBJ1 NP/OBJ2]] (e.g. *John gave Susan a book*) versus a dative realized by a prepositional phrase, either *to* or *for* [NP/SUBJ

[VP/PRED NP/OBJ PP/OBL]] (e.g. *John gave a book to Susan*). The former receives the name of *ditransitive construction* whereas the latter is called *dative construction*. From now on, the term construction will replace the notion of syntactic alternation, which is somewhat reminiscent of the Chomskyan derivations. Also, the LCM treats this construct as epiphenomenal, viz. the side effect of variation in lexical-constructional subsumption (cf. Ruiz de Mendoza & Mairal 2011). In the transformational tradition, the ditransitive construction was understood as a derivation from the dative or prepositional construction.

Goldberg (1995) states that the ditransitive construction can be skeletally represented as X CAUSES Y TO RECEIVE Z. This construction is regulated by the following semantic constraints:

- (i) It supplies transfer semantics that cannot be ascribed to the lexical verb.
- (ii) The goal argument must be animate (recipient rather than patient).
- (iii) Two non-predicative NPs are licensed in post-verbal position.
- (iv) The recipient role is correlated with an object function.
- (v) The subject position must be occupied by a volitional agent who intends transfer.

Thus, in the sentence *Sue knitted Mary a sweater*, the transfer meaning is contributed by the ditransitive construction and not by the lexical verb *knit*, which solely describes the creation of a fabric or garment by joining thread in a series of connected loops, either by hand, using knitting needles or on a machine. The semantic constraint in (ii) was postulated to account for the ungrammaticality of utterances like **John sent Madrid the book*, where *Madrid*, which is not a prototypical recipient but an inanimate location, cannot be said to actively participate in the reception event (see section 2.1). Goldberg

herself (1992: 61) remarks that the recipient animacy constraint is obscured by an example like *The music lent the party a festive air*, where neither the subject nor the receiver are animate. She solves this problem by postulating the CAUSAL EVENTS ARE TRANSFERS metaphor which allows the animacy of the recipient to be satisfied in the source domain, but not in the target domain of the metaphor.

Furthermore, as will be discussed at length in section 4.3.2, the semantic constraint in (v) blocks out the subsumption of verbs like *pony up*, *cough up*, *shell out*, or *fork out* into the ditransitive construction (cf. *George ponied up/coughed up/shelled out/forked out \$ 3000 to Bob* vs. **George ponied up/coughed up/shelled out/forked out Bob \$ 3000*). The LCM accounts for these cases by means of the Lexical Class constraint, whereby membership to a certain verbal class determines the syntactic behavior of that verb. Thus, the verbs mentioned above belong to a class that gathers all the verbs encoding unwillingness of transfer on the part of the agent. The agent's unwillingness to transfer an entity to the recipient makes these verbs incompatible with the ditransitive construction, which requires the agent's intention to cause the recipient to have an entity. At this point, it is worth noting that the semantic constraint in (v) does not seem to hold for the following: [...] *if he sometimes almost won, that lent him hope and kept him playing on* (BNC 898). Nevertheless, Goldberg (1992) accounts for examples like this by postulating the low-level metaphor CAUSAL EVENTS ARE TRANSFERS. In our sentence the giver is mapped onto the causing entity which is an event, whereas the receiver is projected onto the developer of hope. The effect of the event (hope) is viewed as a concrete object that can be transferred from a lender to a receiver. Holding possession of an object correlates in the target domain with the effects of the action of causing someone to be hopeful. Goldberg (1992: 61) also argues that volitionality is not mapped onto the target domain simply because the target domain

refers to abstract causes and volition is a human trait. No explanation is given for the ungrammaticality of the dative counterparts (e.g. **that lent hope to him*). Panther (1997) takes up this issue and claims that the concept of causation in these cases is too abstract to be conceptualized in terms of a moving object sent by an agent along a path to a receiver. However, this argument is less than convincing given that it is possible to treat as objects very abstract concepts such as love (*He has a lot of love for mankind*), hate (*We could see hate in his eyes*), ideas (*The idea came across fine*), beliefs (*The beliefs she has are to be respected*), and so on. Besides, Panther does not give any criteria to determine whether a concept is more abstract than others. A better solution to the problem comes from the field of *conceptual prominence*. The verb *lend* in this expression is used in the sense of ‘provide support which is not to be returned’. The ditransitive construction gives prominence to the possession relationship between the receiver and the object, in contrast to the dative construction, where the focus of attention is on the transfer process. It follows that the ditransitive construction is a better choice to capture the ‘provide support’ meaning of this use of *lend*.

Drawing on Gropen *et al.*’s (1989) nine verb classes that select the ditransitive construction, Goldberg (1989: 81; 1992: 56) elaborates her own polysemous network for all the meanings of this construction, which depart from the central sense, i.e. a successful transfer of an entity from a volitional agent to a recipient. The verbs displaying this central meaning are: (i) verbs that inherently encode acts of giving such as *give, feed, serve*; (ii) verbs of instantaneous causation of ballistic motion such as *throw, shoot, toss*; and (iii) verbs of continuous causation in a deictically-specified direction like *bring* or *take*. Goldberg (1989) argues that this concrete transfer meaning was chosen as the central sense of the ditransitive construction because, as linguistic studies have demonstrated, concrete meanings are more basic diachronically (Traugott

1988, Sweetser 1991) and synchronically (Lakoff & Johnson 1980). There are other five main classes of extensions of the central meaning:

(i) Verbs coding intended transfer such as verbs of creation (e.g. *bake, make, build, cook, knit*) and verbs of obtaining (e.g. *get, win, earn*). These verbs combine with a benefactive construction (e.g. *I got the book for you*), but reject the dative construction (e.g. **I got the book to you*). Goldberg's (1992) account does not give any explanation for the ungrammaticality of the *to* prepositional phrase. We contend that this could be motivated by means of the Internal Variable Conditioning constraint in application of which the semantic make-up of the verb *get* restricts the choice of its constructional arguments. The verb *get* can be used when an agent obtains control of an object (*I got the book* suggests that the speaker has the book). This clashes with the focal requirements of the dative construction, i.e. exclusive motion of an object from the agent's location to a recipient's location, thus involving the lack of control of the agent over the object. The manner in which the agent comes to possess the entity to be transferred becomes conceptually more prominent than the idea of motion of that entity from the agent to a recipient (see also Rosca 2012c);

(ii) Verbs of giving with associated 'satisfaction conditions' à la Searle (1969). Verbs listed here are: *promise, guarantee, order, owe*, etc. The verb *promise* does not involve actual transfer, not even in the ditransitive construction. For the sake of clarity, consider the sentence *Sarah promised Catherine her old car, but then gave it to her son instead* (example extracted from Rappaport & Levin 2008: 146). This utterance suggests that the ditransitive construction cannot secure a 'successful transfer' interpretation, but it is rather the meaning inherent in a verb that determines the availability of this meaning. Thus, the verb *promise* entails a

successful transfer only in “models in which the set of circumstances is restricted to those in which people honor their promises” (Koenig & Davis 2001: 85);

(iii) Verbs of refusal such as *deny*, *refuse* (e.g. *Susan refused Tom a kiss*). In connection to these verbs, Van der Leek (1996) notes that Goldberg’s theory faces some drawbacks such as the fact that the ditransitive construction itself cannot supply the negative element in *cause not to receive*, this being contributed by the lexical verb. In an attempt to establish a conceptual link between the ditransitives entailing successful transfer and those entailing denial of the prototypical frame, Goldberg (1997: 393) states that the latter presuppose that their positive counterpart is “on the table” (cf. Givón 1979, Horn 1989: 68). Givón (1979: 139) rightly claims “Negatives in general are uttered in a context where the corresponding affirmative has been discussed, or else where the speaker assumes[...]the hearer’s bias toward or belief in- and thus familiarity with- the corresponding affirmative”. Furthermore, Goldberg is unable to provide a reasonable explanation for verbs like *bet*, *cost*, *envy* or *forgive*, which are treated as exceptions. Coleman & De Clerck (2008) discuss such exceptions (*envy* and *forgive*) and argue that their occurrence in the ditransitive construction cannot be exclusively accounted for by etymological explanations (in OED *forgive* had the meaning of ‘give, grant’, while *envy* had the meaning of ‘give grudgingly, refuse to give’). Thus, Coleman (2008: 206) proposes an extension along the causality dimension by incorporating an attitudinal component: the subject has a particular feeling/attitude towards a possessive relationship between the indirect and the direct object (i.e. the subject would like the indirect object to lose the direct object in the case of *envy* and the subject’s act of forgiveness causes the indirect object to lose the metaphorical burden of guilt in the case of *forgive*). Hudson (2008: 275)

also deals with the verb *envy* and he notices that it cannot be paraphrased with a *to* nor a *for* prepositional phrase (cf. *She envied her good looks *to/*for her friend*). Since the envied person already has the attribute that someone else envies, it is not possible to make him or her either the beneficiary or the recipient of that attribute (e.g. *She envied her friend's good looks*). That is why the dative construction, which implies literal motion of an entity, is out of question here.

(iv) Verbs of future having such as *bequeath*, *leave*, *allocate*, *reserve*, *book* indicate that the subject acts to cause the indirect object to receive the direct object at some future point in time. In the sentence *At this point one of his rich relations died and left him a lot of money in his will* (COCA 1992), the possessive relationship between an entity and a recipient is made possible in the absence of the giver. Nevertheless, it is perfectly acceptable to construe a situation in which there is no actual transfer of information between the agent and the intended recipient despite the implications of a ditransitive construction. Take for instance the sentence *He knew his father left him a note but never asked to read it*. This example clearly shows that Reddy's (1979) *Conduit Metaphor*, whereby messages are understood as physical entities that can be transferred from one person to another, is not operational when the recipient is unwilling to receive the agent's message. Therefore, the successful transfer inference is defeasible in examples which select verbs of future having, since these verbs involve a prospective transfer whose realization depends on many factors that sometimes cannot be controlled by the agent, i.e. the willingness of the recipient to participate in the transfer as in the case of *leave*. Consider now the use of the verb *book* in the ditransitive sentence [...] *he'd booked her a seat with us on the flight south from Lima* (COCA 1991). The ditransitive construction typically codes a transfer of

possession. However, in this example, the transfer meaning is overridden by the semantics of *book*, which only involves engaging a service. We may wonder why this verb can be used in the ditransitive construction, which is specifically intended to indicate a transfer of possession. On a deeper level this is possible because we can understand a service (just like an abstract entity) as if it were an object. In this new light, services can be figuratively transferred and possessed. This possibility is further reinforced by the fact that services may have, just like transfers, a beneficiary and the ditransitive construction also requires a beneficiary. However, if we compare the sentences *He booked Martha a seat on the flight* and **He closed Martha the window*, we can notice that in both of them an agent is doing a favor to a beneficiary but only the first one is grammatically correct. What differentiates them is that in the first case the dative slot has double valency: the recipient role conflates with the beneficiary role. In contrast, in the second example the indirect object is only the beneficiary of a situation (Martha was feeling cold and he went to close the window in her place, but the outcome of the situation does not entail any possessive relationship between Martha and the window).

(v) Verbs of permission whose subjects enable reception to happen, e.g. *permit*, *allow*, *offer*. Again, Rappaport & Levin (2008: 146) show that a future having verb like *offer* can obscure the ‘successful transfer’ interpretation of a ditransitive construction (cf. *Max offered the victims help, but they refused his offer*). It has been suggested that the root of this verb involves “a sublexical modality component which restricts the possible worlds in which successful transfer holds” (Rappaport & Levin 2008: 146). These future having verbs are contrasted with *give*-type verbs in (i) which always encode an immediate and actual transfer that

cannot be blocked or prevented from taking place, as can be seen in examples like *#My aunt gave/lent/loaned my brother some money for the new skis, but he never got it* (examples from Rappaport & Levin 2008: 146).

It must be noted that all the observations considered above do not affect the LCM, since this linguistic account gives equal importance to the constructional and verbal semantics. One last mention should be made here about the ditransitive construction. According to Panther (1997), the syntactic position of the indirect object in the ditransitive construction iconically reflects the strong impact of the verb onto the recipient and it strengthens the implicature of possession, which is cancellable in the case of the prepositional construction (cf. *I handed my book to him, but he didn't take it* vs. *?I handed him my book, but he didn't take it*).

As far as the dative construction is concerned, the LCM treats it as a subcase of the caused-motion construction, which was examined in detail in section 4.3. The dative construction can be explained in terms of *give* verbs being licensed into the caused-motion construction by the high-level metaphor TRANSFER IS MOTION. Take for example the sentences in (28):

(28) a. *John gave a book to Mary.*

b. *John sent a book to Mary.*

c. *John sent a book to Madrid.*

Sentence (28a) illustrates a prototypical dative construction since the transfer meaning, which is conveyed by the verb *give*, prevails over the motion one and there is a human recipient. Example (28b) is a less prototypical case of the dative construction since it

incorporates the motion verb *send*. Finally, (28c) is a canonical case of the caused-motion construction since it combines a motion verb with an inanimate location as recipient. The examples reproduced in (28)(a)-(c) reveal that there is a continuum from a pure transfer meaning (28a) to a purely motional meaning (28c). The dative construction (28a) is only a subcase of the caused-motion construction where the dative element does not arise from the construction itself but from the combination of a transfer verb and a human recipient. When dealing with the ditransitive and the dative constructions, Pinker (1989) posits that the ditransitive has the form [X acts-on Z] to the effect that [Z has Y], whereas the prepositional variant [i.e. the dative] has the semantics [X acts-on Y] to the effect that [Y goes to Z]. Goldberg (1995, 2002) considers the dative construction to be a daughter construction of the caused-motion construction (cf. Coleman & De Clerck 2009). Other scholars that have understood the dative construction as a case of caused motion are Pesetsky (1995), Panther (1997), Harley (2002) and Krifka (2004). Additionally, Pinker (1989) and Langacker (1991) understand the difference between the ditransitive and the dative in terms of focal prominence. In their view, the ditransitive construction focalizes the possessive relationship between a recipient and an entity whereas the dative construction stresses a path scenario, i.e. the trajectory followed by the transferred object. Similarly, Panther (1997) claims that the dative construction has a spatial (metaphorical) basis, that is to say, a spatial scenario (e.g. *The train moved to London*) is mapped onto a more abstract transfer scenario (e.g. *She left him a fortune in her will*).

4.3.1. Levin's (1993) semantic criterion for *contribute* verbs

Levin (1993) lists eighteen verbs which share the conceptual structure and the syntactic configuration of the verb *contribute*, i.e. *administer*, *disburse*, *distribute*, *donate*, *extend*, *forfeit*, *refer*, *reimburse*, *relinquish*, *remit*, *restore*, *return*, *sacrifice*, *submit*, *surrender*, and *transfer*. Levin (1993) claims that the internal semantic parameters of a verb function as important predictors of its range of syntactic representations. Thus, Levin's (1993: 138) *contribute* verbs must have in common a contribution sense which motivates their compatibility with the dative but not with the ditransitive (nor with the *with*-construction attested with *entrust*). Nevertheless, verbs like *remit*, *return*, *reimburse*, and even *donate* were found to participate in the ditransitive construction.⁸⁶

- (29) a. *The master does not remit him his hundred pieces, but these ten only*
(Sketch engine doc#644338)
- b. *She was deprived of all means of remitting him money* (Sketch engine doc#1223079)
- c. *I returned him the keys, [...]* (Sketch engine doc#220759)
- d. *The landowner reimbursed him \$500 of the cost of the fertilizer in February 2007* (Sketch engine doc#1118556)
- e. *Luckily for him his cousin donated him a kidney* (Sketch engine doc#299426)

⁸⁶ It should be mentioned that Levin (1993) classifies these three verbs as *contribute* verbs but she provides no examples to support their similarity in constructional behavior, i.e. participation in the dative construction and rejection of the ditransitive construction.

f. *Ahern confirmed Michael Wall did sell him his Dublin home in 1997 but claimed Wall did not donate him any money* (Sketch enginedoc#1082617)

These counterexamples cast doubt on the validity of Levin's (1993) semantic criterion for verbs of contribution. Can we really say that a verb inherits its syntactic behavior exclusively from one semantic class? And what is more, what should we understand by a contribution sense? The presence of several donors with their several donations, the benefactive meaning supplied by the action performed by the agent/agents or both? What most of these verbs have in common is the fact that the action denoted by the verb is somewhat beneficial for the recipient. Thus, in the sentence *He had previously relinquished his post to his brother [...]* (BNC GSX 534), there is only one giver who renounces his position in favor of a recipient. In some cases it may happen that the transferred entity is not benefiting the receiver in any way. This can be observed in the sentence *You mean, could I have administered poison to Sir Thomas?* (COCA 1992), which lends itself to a malefactive reading, i.e. the recipient's life is threatened by an ingested entity. From this discussion still arises another question: can we really assume that the use of the *to*-dative in this sentence is licensed by a contribution meaning? There is no collaboration of multiple agents nor does the sentential meaning involve a beneficial transfer for the recipient. Last, how would Levin account for a sentence like *[...] he transferred it [the envelope] to the inside pocket of his jacket [...]* (COCA 1979), in which there is only one agent, there is no animate recipient and the connotations of the transfer are neutral? If Levin grouped these verbs under the *contribute* class label because of the activation of a benefiter model, then what would differentiate this class from *give*-type verbs, which can also involve a beneficial transfer for the recipient? So, how valid is this semantic criterion for the motivation of the dative construction? Obviously, in view of these problems, it is not a fully reliable one.

In the next section our aim is to show that the subsumption of these verbs into the dative construction is licensed by several factors, such as (i) the presence of multiple agents, multiple transferred entities and multiple recipients which deprofile the possessive relationship between a unique recipient and an object; (ii) the lack of an animate recipient that can cooperate in the transferring event; (iii) the agent's unwillingness to transfer an entity to a recipient; (iv) the CONTAINER image-schema evoked by some verbs, and (v) the motion to a different location that gains more prominence than the possession relationship between a recipient and an object. Hence, we cannot place the whole burden of subsumption uniquely on the conceptual make-up of verbs, since lexical-constructional integration can also be governed by the focal requirements of a construction, by the semantics of the subject and objects, and by contextual factors, as generally postulated by the LCM.

4.3.2. *Contribute* verbs and their constructional behavior

After the above preamble on the principles that regulate the subsumption of Levin's (1993) *contribute* verbs into the dative construction, we move on to discuss them in greater detail.

We will first examine the case of the verb *contribute*. Consider the sentence *We contributed our paycheck to her*, which was extracted from Levin (1993: 139). This sentence is an example of the *dative construction*, which the LCM treats as a subcase of the caused-motion construction, as already mentioned in section 4.3. The reason for this treatment lies in the experiential grounding of the meaning of the dative construction, which basically conveys a transfer of possession. However, the dative highlights the importance of the object transferred over the transfer itself (which in some cases may

not even take place physically). As noted in Ruiz de Mendoza & Mairal (2011), a prototypical transfer of possession involves the giver handing the object over to the recipient. In this process, the giver loses possession of the object, which after the transfer has been completed, falls within the recipient's sphere of control. In this prototypical scenario, the giver is a causer of motion, the gift is a moving object, and the recipient is the destination of motion. Non-prototypical uses of the dative construction substitute 'affording access to the object' for 'causing the object to move from the giver to the recipient' and 'gaining control' for 'gaining possession' of the object given. In *We contributed our paycheck to her*, which is an example of a non-prototypical use, the paycheck is thus seen as coming under the control of the recipient, whether the paycheck has been physically and personally handed over to the recipient by the contributors or not. The dative construction is a special case of the caused-motion construction where there is a conflation between the roles of destination and recipient of an object, with greater degree of prominence on the recipient role. Interestingly enough, as we will see later on, some verbs (e.g. *shell out*) may be more compatible with the caused-motion construction than its dative subcase even if there is a recipient role, simply because the verb has an inherently strong force-dynamic interpretation.

The dative construction usually alternates with the ditransitive construction (cf. *John gave a book to Peter/John gave Peter a book*). However, the verb *contribute* cannot take part in the ditransitive construction (cf. **We contributed her our paycheck*). The reason for this puzzling property of this verb, however, is not captured by the set of internal and external constraints postulated thus far in LCM. Let us first consider internal constraints, which relate to the event structure of lexical items and their associated encyclopedic knowledge components. *Contribute* inherits much of its internal structure from *give*: there is a transfer of possession (any object for *give* and

usually money for *contribute*) from a donor to a recipient. If the transfer involves a material object, there is also motion of the transferred object across space. Since we have both the possession and the transfer elements, it is only natural to find a transfer verb like *give* both in the ditransitive and the dative constructions. However, *contribute*, which contains the same transfer and possession elements as *give*, only takes part in the dative construction. If internal constraints based on the conceptual structure of the lexical and constructional configurations cannot account for this behavior, we may wonder whether this may be a matter of external constraints or not. However, upon closer scrutiny, this does not seem to be the case, since this verb is allowed in the dative construction on the same grounds as other *give* verbs and it is disallowed where no conversion process is required. Therefore, the solution to this problem needs to be found elsewhere. We would like to argue that the explanation can be located in the area of *focal prominence* phenomena, as discussed in the context of Cognitive Grammar (cf. Langacker 1987, 1999). By way of illustration, consider Langacker's (1991a: 13-14) explanation of the contrast between the dative and ditransitive in terms of the prominence given to certain facets of the 'send' scene:

(30) a. *Bill sent a walrus to Joyce.*

b. *Bill sent Joyce a walrus.*

The dative construction in (30a) lends more conceptual prominence to the trajectory followed by the transferred entity, whereas (30b) focuses more on the possessive relationship between the walrus and Joyce which "results when the walrus completes its trajectory" (Langacker 1991a: 13-14). The difference between these two ways of construing the same event is supported by the acceptability of *I sent a walrus to Antarctica* and the ungrammaticality of *?I sent Antarctica a walrus*. The first sentence

is “fully acceptable because *to* emphasizes the path traversed by the walrus, and a continent can perfectly well be construed as the endpoint of a path” (1991a: 14). The second sentence is incorrect because “it is harder to construe a continent as a possessor exercising control over other entities” (1991a: 14).

However, the subsumption of the verb *contribute* into the dative construction cannot be explained only in terms of the destination-beneficiary perspective. This situation calls for the addition of another internal constraint to the list provided by the LCM. We shall call this constraint *Focal Prominence Compatibility*.⁸⁷ According to this constraint, which is not based on structural compatibility between concepts, a verb cannot be fused with a construction if the inherent focal prominence requirements of the verb and the construction are different. Thus, the verb *contribute* means to “give something [money/goods/effort/time/ideas/help] along with others to a common fund or for a common purpose”. The basic schema of *contribute* is represented below:

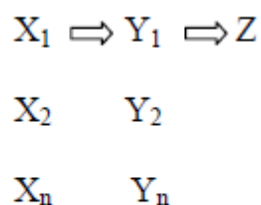


Figure 4.6 Basic schema of the verb *contribute*

X is the agent who causes Y (the amount of money) to go to Z (a common fund). The subscripted numbers (from 1 to n) refer to multiple subjects who give different amounts of money. As can be observed, this verb presupposes the existence of multiple giving events, which makes it clash with the focal requirements of the ditransitive

⁸⁷ Similar considerations have been made within the LCM by Del Campo (2011) in the context of the interpretation of speech act meaning on the basis of illocutionary scenarios.

construction (i.e. a unique/single possessive relationship between a recipient and an object).⁸⁸

In a similar fashion, the verbs *chip in* and *kick in*, which belong to the informal register, refer to a group of people in which each person gives an amount of money in order to buy or pay something together. As hyponyms of *contribute* they are expected to show the same syntactic behavior, i.e. participation in the dative construction:

- (31) a. *Eller and his family also gave the state GOP \$25,280 in August and chipped in \$5,250 to the Bush campaign* (Sketch engine doc#666734)
- b. *In eight years, participating maquilas boast they've kicked in a whopping \$300,000 to community improvements* (Sketch engine doc#473169)

Now, both *contribute* and *donate* exploit the motion construal in which entity Y moves from X to Z. Van der Leek (1996: 331) assumes that *donate* cannot appear in the ditransitive construction because the goal of this verb is typically an (inanimate) institution that cannot cooperate and the ditransitive construction requires cooperation on the part of the recipient (cf. **He threw the tree the ball*). However, there are two problems with this assumption. First, an institution can in fact cooperate; it does so through the people who are responsible for it. Second, we find both ditransitive and dative uses of *donate*, as in *Luckily for him his cousin donated him a kidney* (Sketch engine doc#299426) and [...] *his cousin donated a kidney to him*, where the recipient is animate and in fact does cooperate. What actually differentiates *donate* from other *contribute*-type verbs is that the object given (usually money) is intended for a good

⁸⁸ The verb *contribute* favors not only the dative construction but also other syntactic configurations which encode directionality and highlight the trajectory followed by a transferred entity (e.g. *It is a tremendous achievement for the twenty-nine people of the department who all contributed towards the donation*; BNC HRY 256; *Kids contributed towards cleaning the house*). These constructions are licensed by the metaphor GOALS ARE DESTINATIONS, whereby life purposes are conceptualized as destinations (cf. *Tom and Mary are heading towards divorce*).

cause, i.e. there is an initial recipient, which may or may not be an institution, and a final beneficiary –which may or may not coincide with the recipient– which is generally recognized to be the best possible destination of the money. The difference between *contribute* and *donate* is that donations are not joint ventures, i.e. they are not made in common with others. That is why one “donates” (not contributes) blood or an organ. But donations, like contributions, involve the existence of a fund or an (expectedly beneficial) cause.

The verb *subscribe* is a hyponym of *donate* and accepts a dative construction (cf. *He did not seek re-election to the Parliament of 1685 and supported the Revolution of 1688, subscribing money to the new regime; COCA*). The basic schema for *subscribe* is illustrated below:

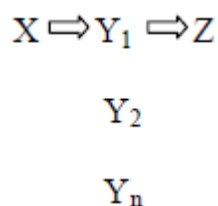


Figure 4.7 Basic schema of the verb *subscribe*

The very definition of the verb *subscribe* (to give an amount of money at intervals) hints at the reiterative aspect of the Y_{1-n} element.

Goldberg (2005a) points out that verbs such as *contribute* or *donate* have a greater constructional potential than has been claimed. Hence, they can appear without an overt theme argument, in spite of an overt directional meaning: *She contributed/donated to the Leukemia Foundation*. What is even more surprising, the verb *give*, which fuses perfectly with the dative construction, can omit the theme argument when it has a contributive meaning: *She gave to the Leukemia Foundation*. Goldberg suggests that the

omission of the patient role is possible for politeness reasons (i.e. usually it is not polite to specify the amount of money that is being donated). In addition, the unexpressed theme argument is semantically recoverable as a consequence of the activity of the *deprofiled object construction*, which of course is but part of a larger (ergative) constructional family where patients are omitted from syntactic expressions (see Lemmens 2006, for a detailed discussion of this phenomenon). In terms of the LCM, deprofiling the object from a level-1 argument structure construction is a manifestation of the effects of level-4 or discourse operations on lower levels of meaning structure. In the present case, the deprofiled object construction, because of its impact on the topicalization of the various message elements, can be considered a level-4 discourse construction which has the effect of eliminating the level-1 object argument from overt expression as a direct object. Note that in *She gave a lot of money to me* it is almost impossible to deprofile the object (*#She gave to me*) because of its inherent focal quality in contrast with *She gave [money] to the Leukemia Foundation*, where the object is less important than the recipient, which has greater inherent prominence and for this reason cannot be considered a topical element.

We now turn to another verb, *distribute*, which is defined as sharing things among the members of a particular group. Van der Leek (1996:331) suggests that the reason why *contribute* and *distribute* only select the dative construction is that *contribute* presupposes the existence of multiple givers and *distribute* implies the existence of multiple recipients. Thus, when someone contributes to a cause, it is taken for granted that there are other potential contributors. When distributing, there are many different receivers. The criterion required by the ditransitive construction, i.e. the complementariness between the roles of subject and first object (a.k.a. the indirect object), is not met since there is a multiple aspect linked to the subject role (*contribute*)

and to the first object role (*distribute*). The latter verb can be envisaged as a reiterative giving event in which the same acting entity performs multiple movements to different locations in order to give an item of equal value to a number of people individually. Thus, in *The cughtagh [...] distributed gifts to the needy folk in hill villages* (COCA 1990), the individuality of the recipients is not important and their identity can be unknown, except for the sole information we have about them, viz. they are poor people living in hill villages. Therefore, the verb focalizes the action that enables the multiple recipients to come into the possession of the transferred entity. The Focal Prominence Compatibility constraint disallows the verb *distribute* from combining with a ditransitive construction, since there are multiple recipients and it is difficult to focus on the possession relationship, which becomes secondary. Thus, the verb *distribute* displays the following basic schema:

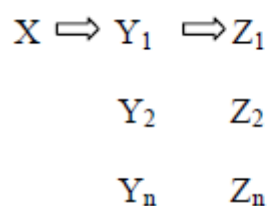


Figure 4.8 Basic schema of the verb *distribute*

Contribute is characterized by an expansion of the left wing of the basic schema whereas *distribute*, which is the mirror image of *contribute*, expands its right part (i.e. one distributor X gives multiple entities (Y_{1-n}) to multiple recipients (Z_{1-n})).

When *distribute* is used in the sense that what is distributed has been previously divided into shares, its hyponyms are the following: *deal out*, *share out*, *mete out*, *dispense*, *parcel out*, *ration out*, *divide out/u*, *portion out*, *apportion*, and *divvy up*. We have also found out that the hyponyms of the verb *distribute* share the same

complementation pattern (i.e. participation in the dative construction) as their genus (or superordinate term), as in the examples reproduced in (32)(a)-(g):

(32) a. [...] *she dealt out* a rock of coffee sugar to a waiting child (BNC H7H 389)

b. *Apparently she regularly dispensed* medicines to "those not in acute distempers" among her "own sex and little children" (COCA)

c. [...] *courts in both England and the United States have displayed a general unwillingness to mete out* harsh punishment to those found guilty of cruelty to animals [...] (BNC B04 540)

d. *He happily shares out* his cars to his staff *once he's test driven them, letting them choose a TAP plate with their initials* (Sketch engine doc#466721)

e. *Thatcher also used to parcel out* jobs to representatives of different interest groups in the party (BNC CAH 405)

f. "*The Lord portioned out* the good things in life to me *just fine,*" she said (Sketch engine doc#1815968)

g. [*We have*] [...] *to address the issues of* [...] *attempting to identify and apportion* expenditure to individual schools *and colleges to meet the requirements of the Education Act 1988* (COCA 1990)

h. '*God divides out* the measure of faith to each' (*Rom. xii. 3*) (Sketch engine doc#673761)

g. *Working in Woomera as 1st teller I had to ration out our meagre supply of US currency to the troops stationed there* (Sketch engine doc#258415)

Thus, the verb *distribute* represents the genus of this group, whereas the verbs *deal out*, *mete out*, *share out*, *parcel out*, *portion out*, *divide out*, *ration out* are its hyponyms or subordinate terms, which inherit the syntactic configuration of their genus, i.e. the selection of a dative construction plus an *among/between* phrase:

(33) a. [...] *how did they portion out the forum among them* [...] (Sketch engine doc#639009)

b. [...] *Over ten years after the Taif peace accord which agreed new mechanisms to share out political office between the country's confessional groups* [...] (Sketch engine doc#232101)

c. [...] *he wishes to divide out virtue among its inhabitants* [...] (Sketch engine doc#2319495)

d. *Nuri* [...] *rationed out his doctors among the hospitals* [...] (Sketch engine doc#2317832)

It should be noted that these hyponyms of the verb *distribute* are phrasal verbs containing the preposition *out*, which is used to indicate the motion of the portions of an object from their original integrated position within the distributor's sphere of control to a non-integrated position outside such area.⁸⁹

Moreover, we believe that Levin's (1993) *contribute* list of verbs should also include the phrasal verb *pay out*, which is a hyponym of *pay*. The elaboration of

⁸⁹ *In* and *out* are the linguistic manifestations of the CONTAINER image schema. Image schemas have been defined by Johnson (1987) as abstract conceptual representations that derive from our sensory and perceptual experience of the external world. Image schemas are not innate knowledge structures and, since they arise from ongoing embodied experience, they are subject to transformations (cf. Lakoff 1987; Peña & Ruiz de Mendoza 2009). Thus, the image schema CONTAINER derives from our recurrent daily experience with different types of containers: rooms, clothing, bed-covers, etc.

definitions for each and every troponym and hypernym of the verb *pay* leads to a representation similar to the one below:

pay to give someone money for goods or services

pay out to pay [a lot of money] for something

disburse to pay out money [from a fund]

shell out to pay out money [unwillingly](informal)

fork out to pay out money [unwillingly] (informal)

cough up to pay out money [unwillingly] (slang)

pony up to pay out money [that you owe] [unwillingly] (informal)

The hyponyms of *pay out* display the same syntactic behavior as their genus on the basis of inheritance mechanisms (i.e. they can participate in the dative construction) as exemplified below:

- (34) a. *We paid out pensions to ten million people and Child Benefit to every family in the land* (COCA 1991)
- b. *One of his current preoccupations is the way in which the Australian literature boards disburse their grants to writers* (COCA)
- c. *If the Department of Health are prepared to shell out money to keepers of a vermin-infested tenement then the officials are to blame* (BNC H8M 480)
- d. *Did British and Cosmopolitan also fork out a small fortune to her family to which they were not entitled?* (COCA 1991)

e. *In the face of pressure from labor leaders and German politicians, Siemens ultimately coughed up \$46 million to aid workers who lost their jobs* (Sketch engine doc#9089)

f. [...] *Mr. Cheney was way, way out there, always willing to pony up money to guerrillas in Nicaragua and Angola [...]* (Sketch engine doc#539825)

Some of these hyponyms may select a *for* phrase just like their genus *pay out* (e.g. *The Maktoum family paid out fortunes for horses in the eighties [...]*; BNC CH3 7178; *Furious rail passengers had to fork out for taxis yesterday [...]*; BNC CH2 9786; [...] *The gavel-bashing toastmaster was in order by repeatedly calling for " gentlemen " to cough up money for raffle tickets*; COCA 1992; *Then Kurt has to shell out a considerable amount of money, maybe \$25,000, for the first class plane seats [...]*; BNC CHB 881). *Shell out* is an informal hyponym of *pay out* which indicates unwillingness on the part of the agent to spend all that money whilst *disburse*, whose use dates back to the mid 16th century, comes from the old French word *desbourser* ('remove from the purse' < *bourse* "purse"). Its etymological definition clearly proves that the original use of the prepositional phrase was motivated by the image-schema this verb evokes, viz. the movement of the amount of money from the fund to someone else's dominion. In the case of *cough up*, the use of the dative construction in (34e) could be accounted for by a metaphorical extension from the expulsion of air out of the throat with a sudden and harsh noise (*cough*) to the movement of a sum of money from one person's field of possession to another entity. Likewise, the association of the verb *shell out* with the caused-motion construction can be explained through the combination of a metaphor and a metonymy. The metaphoric source –which is accessed metonymically from the

conceptual material directly invoked by the linguistic expression– involves the image of extracting nuts or beans from their shells (*shell*), which is mapped, in the metaphoric target, onto the action of taking money out of one’s pocket. Moreover, *shell out*, *cough up*, and *pony up* have in common the agent's unwillingness to transfer the money to a recipient which is clearly incompatible with the ditransitive construction, which requires the agent's intention to cause the recipient to have the transferred entity.

For Davidse (1996:332) the verb *extend* is mainly construed as patient-centered transfer, as in *Spain is extending aid to Haitians who have been affected by the earthquake*. As for the things transferred (i.e. *help, support, aid, benefits*), it should be emphasized that these are abstract in nature and could be understood as ways of contributing to a good cause. The verb *extend* comes from the Anglo-French word *estendre* (late 13th century), which was derived from the Latin verb *extendere* “stretch out”= *ex* “out” + *tendere* “to stretch” (*Online Etymology Dictionary*). It is clear that initially this verb had the meaning of delimiting a large area of land (cf. *The Roman Empire stretched/ extended [from Spain] to the river Danube* ‘The Roman Empire possessed all the territory from Spain to the Danube’) and later on, through a metaphoric process (i.e. the TIME IS SPACE primary metaphor), it also came to be associated with expansion in time (cf. *I intend to extend my visa*).

The related phrasal verb *stretch out* means to hold out one’s hand, foot, etc., in order to reach something. In the example *Sam stretched out/extended his arm to take the apple from the tree*, we notice that a person comes into the possession of an entity by extending his/her arms (body) towards the location of that entity. Here, in this future possession event, one party is mobile (Sam), whereas the other one is stationary (the tree). It goes without saying that the human mind inextricably links movement

(extension of the body) with possession and the reverse process (i.e. loss of possession as in *I extended my hand to give her an apple*) is based on the same association. Experiential grounding makes us associate motion towards an object with its subsequent possession. Thus, the first sentence mentioned in this paragraph, i.e. *Spain is extending aid to Haitians who have been affected by the earthquake*, which is metaphorical, has to be understood against this background blending movement and possession. Therefore, a country (which metonymically stands for the people who rule it) moves a long distance in order to give material help (goods or money) to another country. From the basic meaning of the verb *extend* (i.e. to stretch an object out over a distance), through a metonymic shift, we can obtain the meaning of extend as *offer*, since (prototypically) we put our hands forward when we offer help. *Aid* is an abstract concept that can be interpreted metaphorically as if it were an object (ABSTRACT ENTITIES ARE OBJECTS). This metaphor enables us to build *aid* into the shifted meaning of *extend*: put our hands forward in order to offer aid (the object). We also contend that the heaviness of the indirect object in this example (e.g. *Haitians who have been affected by the earthquake*) can be a motivating factor for the occurrence of the verb *extend* in the dative construction. Complex sentence constituents prefer the rightmost position (cf. Leech's (1983: 65), discussion of the so-called *end-weight* phenomena in terms of enhancing processibility). The dative construction, by assigning this position to the recipient, makes a perfect fit for heavy indirect objects.

The verb *administer* can take a prepositional phrase headed by the preposition *to* (cf. *One-third also administered medicines to clients [...]*; COCA 1993) and it typically has the meaning of giving someone a measured amount of medication, often by physically introducing the medicine into that person's body, which evokes the image-schema of a transferred entity (medicine) moving from a container (hypodermic needle

or syringe) into another container (a person's body). The verb *administer* favors the transfer perspective over the possession one as can be seen in the examples *The tall woman struggled and continued to call out, until Britta stood back and administered a stinging slap to her face*(COCA 1993), *The lifeboat crew administered first-aid to the fisherman [...]* (COCA 1993). We also contend that the specificity of the transferred entity (usually medicine) can be held responsible for the rejection of the ditransitive construction (cf. **The nurse administered the boy tranquilizers* vs. **The nurse force-fed/spoon-fed the patient the medicine*). The ditransitive construction would imply that the patient behaves like a willing recipient, which is not the case here. The verb *administer*, which is a hyponym of *distribute*, is more specific than its genus because it means “to give [a drug/medicine/treatment] to someone in small portions/doses”. It complies with the following basic schema:

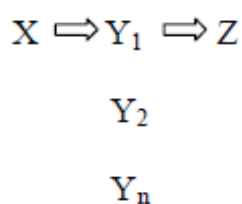


Figure 4.9 Basic schema of the verb *administer*

This development of the Y element incorporates an iterative component (i.e. portions of medicine are given at certain time intervals). This makes this verb incompatible with the ditransitive construction, which is focused on the receiver’s possession of whatever is transferred rather than on the specificities of the process.

Furthermore, the verb *refer* can only appear with a prepositional phrase headed by the preposition *to* (e.g. *I only realised I was still suffering from ME after my doctor referred me to a psychiatrist*; BNC K53 40) and its place within the hierarchical

representation of hyperonyms and troponyms shows that its syntactic configuration is inherited from the verb *direct* whose complementation pattern is passed on from its parent *move*:

move to cause something or somebody to change its position/location

direct to cause somebody to go/move [in a specific direction]

refer to direct a person [to a source of help]

submit to direct [a proposal/an application/etc.] to someone [for consideration]

relegate to direct [a matter/task/etc.] to someone [for decision or action]

Thus, verbs like *direct* or *refer* cannot possibly accept a ditransitive construction, as evidenced by the ungrammaticality of **My GP referred/directed a sleep disorder specialist me*, since no actual possession is entailed between the speaker and the specialist; the only thing that is implied by these verbs is that someone is made to move to a different location or is transferred by his/her doctor to another doctor's office and this can only be conveyed by means of a dative as a subcase of the caused-motion construction.

Similarly, the presence of the verb *submit* in this hierarchy is a predictor of its syntactic environment (e.g. *If you submitted plans to the local council a great many people must know about them* COCA 1989). In fact, the speaker causes the members of the local council to receive the plans so that they can express their opinion about their adequacy. What we are talking about here is a temporary change of possession and, since the members of the local council do not have full rights over the speaker's work (i.e. they are not the owners of his work), the ditransitive construction is ruled out.

Another verb that combines with the dative construction is the verb *relegate*. The dative construction changes its variables (Y and Z) depending on the meaning of this verb: (i) to relegate a responsibility (from X) to Y (assign to Y a responsibility that belonged to X, i.e. causing someone to change his/her status as to the responsibility) as in *The House of Lords did not share the reluctance of the House of Commons to relegate scrutiny of Community proposals from the floor of the House to a Committee* (BNC GWN 828); and (ii) to relegate someone to a lower position (assign someone to a lower class or category, i.e. cause someone to change his/her status), as in [...] *male-dominated organisations [...] have developed customs and practices that [...] relegate women to jobs of low pay and low status* (BNC CM5 1104). The focus is on a change of state, which is seen as a change of location. That is why we have the dative construction (which expresses a change of location) rather than the ditransitive (which focuses on possession).

We do not understand why Levin (1993) lists the verb *transfer* under *contribute* class label given the fact that a transfer is not necessarily beneficial. In a sentence like [...] *officers were transferring him to the county jail* (Sketch engine doc#24517) it is obvious that the location to which the direct object is moved has no positive connotations. Also, as has been discussed in section 4.3.1, the verb *transfer* can indicate a simple change of position of an entity from one location to another with no connotations attached to it as in [...] *he transferred it [the envelope] to the inside pocket of his jacket [...]* (COCA 1979). So, can we really motivate the dative use of *transfer* by postulating a unique contribution sense (cf. *In this case, we will transfer the money to you [...]*; Sketch engine doc#823584)? We consider that in the case of the verb *transfer* the motional meaning becomes conceptually more prominent than the possession relationship which sometimes is inexistent, i.e. there is no possessive relationship

between a jail and its prisoners or between a pocket and its content. It is this shift in conceptual focalization that licenses the dative use of *transfer* and not its contributive sense. The same holds true for the hyponyms of this verb which are listed below:

transfer to cause to move something from one location to another

turn over, hand over, deliver into to transfer [the responsibility for sb/sth] to another person

entrust, leave, commit, consign to transfer sth/sb to sb else [for care and protection]

The verb *commit* is a very formal British English verb which means that someone in authority institutionalizes someone else (e.g. [...] *state psychiatric evaluators once briefly committed him to a psychiatric hospital [...]*; Sketch engine doc#41326), while *consign* describes a situation in which an agent sends something to someone for custody, care or sale (e.g. [...] *Hyams consigned the goods to him [...]*; Sketch engine doc#656479). In the first example somebody loses his liberty by being transferred from the outside world to an institution (a hospital). Here, the dative construction is the only possible option given that the institution is an inanimate recipient that cannot cooperate and it is rather odd to imagine that an institution can possess a prisoner. The verb *entrust* in the dative construction describes a figurative transfer by means of which an agent transfers responsibility for someone/something to another person who is worthy of his/her trust (cf. *Gertrude entrusted the interior management of her monastery to a few pious nuns [...]*; Sketch engine doc#93099). The transfer is not beneficial for the recipient that can be blamed for an inadequate administration of the transferred entity. This explains why this verb selects more readily a dative construction, which places

emphasis on the motional aspect, rather than a ditransitive construction, which activates the possession perspective.

All these verbs inherit their syntactic behavior from their parent *transfer*, as can be seen in examples (35)(a)-(d):

(35) a. *They arrested "Carlos" and turned him over to French authorities [...]*

(Sketch engine doc#196743)

b. *[...] Cartimandua handed him over to the Roman army* (Sketch engine doc#354265)

c. *[...] they [the chief priests and elders] betrayed, or delivered him into the hands of Pontius Pilate to be condemned to death [...]* (Sketch engine doc#675187)

d. *[...] Leave him to me for instruction, as you promised* (Sketch engine doc#555885)

Both *entrust* and *leave* exploit the NP1 V NP3 *with* NP2 pattern (e.g. *[...] Tony entrusts him with the cash*; Sketch engine doc#602147; *The sale of Newstead Abbey [...] left him with a generous income*; Sketch engine doc#351269), which is licensed by a conflation between possession and company, i.e. people are in the habit of seizing and taking control of what is close to them spatially. Unlike *entrust*, the verb *leave* makes use of the ditransitive construction (cf. *Can you leave me some money for the cigarettes?* vs. **Can you entrust me some money for the cigarettes?*). This is so because, in the case of *entrust*, the amount of money given to the recipient is only placed temporarily in the recipient's trust or care. The recipient is not allowed to spend

the money, whereas this does not hold for *leave* since in this case the recipient is not expected to give back the money.

Finally, Levin's (1993) verbs *forfeit*, *relinquish*, *sacrifice* and *surrender* are grouped under the *give up* class, whose hierarchical organization is displayed below:

give up to stop owning and using sth

relinquish to give up [power/ rights/position] [unwillingly]

surrender to relinquish [possession/control] over to [another]

[because of force/pressure]

forfeit to surrender [possession/right etc.]

[because you have broken the law]

yield up to surrender [possession] to [someone

else] [because you are forced to]

cede to surrender [possession] to [another]

[unwillingly] [by treaty]

sacrifice to give up [sth important for you] in exchange [for

sth more important]

The difference between the 'giving' act and the 'giving up' act lies in the fact that the former is understood as a voluntary transfer of information or property to another entity without receiving anything in return, whereas the latter is typically conceived either as a voluntary or involuntary act whereby a person leaves behind or stops doing a regular activity or abandons a habit without involving any transfer. A sentence like *A good health scare helps people to give up smoking* (Sketch engine doc#748220) stresses that the giving up event is caused by an external force (poor health) other than people's will.

A dative construction construing a situation in which an agent renounces a habit in favor of another person would be impossible (cf. **He gave up smoking to her*). It is quite difficult to imagine a context in which someone gives somebody else a habit since the giving act is a telic event (cf. ?*John gave Mary the book for three hours*) and starting a habit takes more time (cf. *Years of working late at night gave me the habit of sleeping at the computer*). However, the giving up event can also refer to cases in which somebody stops having or owning something in favor of someone else (e.g. [...] *the seller will not be obligated to give up the item to the winner bidder [...]*; Sketch engine doc#55556).

The verbs *relinquish* and *sacrifice*, with *surrender* and its troponyms (*forfeit*, *yield up*, and *cede*) inherit their conceptual structure from the hyperonym *give up*, as can be demonstrated by their presence in the dative construction:

- (36) a. *He had previously relinquished his post to his brother [...]* (BNC GSX 534)
- b. *He sacrificed the animal to Juno* (Sketch engine doc#1136328)
- c. [...] *Mithridates' generals in the city gave up all hope and surrendered the city to him [...]* (Sketch engine doc#174196)
- d. [...] *the Sandinistas forfeited power to Violeta Chamorro [...]* (COCA 1992)
- e. [...] *he was required to yield up the city to the Christians [...]* (Sketch engine doc#706114)
- f. [...] *the Soviet Government was willing to cede the city of Vilna and its environs to Lithuania [...]* (Sketch engine doc#166008)

The participation of these verbs in the dative construction can be explained by means of the Internal Variable Conditioning constraint: the world knowledge information encapsulated by the internal variables of these predicates requires the realization of what is given up as their immediate direct object (cf. **He sacrificed Juno the animal*, where *Juno* would automatically be interpreted as the direct object and not the indirect object). In addition, the sentence *He sacrificed the animal to Juno* is based on a high-level metaphor whereby communication is expressed in terms of motion. The act of killing an animal metonymically stands for the plea that the killer sends to the goddess in an attempt to appease her. This metaphoric amalgam is schematically represented in Table 4.9 below:

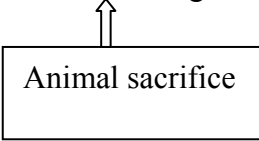
SOURCE \Rightarrow	TARGET
Causer of motion	Speaker/sender
Object of caused-motion (moving object)	Message of submission/obedience
Causing motion	Communicating <div style="text-align: center;">  </div>
Destination of motion (receiver of the moving object)	Addressee

Table 4.9 *He sacrificed the animal to Juno*

This sentence does not encode a spatial transfer of possession, since the animal does not literally move from the killer to the goddess. It is rather a figurative type of transfer whereby a message of submission is conveyed to the goddess. The transmission of the message is understood as motion of a concrete object through space from the killer to the goddess.

4.3.3. FrameNet and Levin's (1993) *contribute* verbs

Out of Levin's (1993) eighteen *contribute* verbs only eleven are listed in FrameNet. The verbs *forfeit*, *reimburse*, and *remit* were not found in FrameNet, whereas verbs such as *administer*, *refer*, *return*, and *sacrifice* are mentioned in this database but they are associated with frames which do not involve any transfer of possession, namely the 'leadership', 'referring_by_name', 'arriving', 'resurrection', 'rite', and 'sacrificing for' semantic frames. The other eleven verbs evoke eight different, but in some cases interrelated, semantic frames, i.e. the 'giving', 'offering', 'commerce_pay', 'dispersal', 'surrendering_possession', 'submitting_documents', 'rejuvenation', and 'transfer' frame. Regarding the relationships between different frames, FrameNet recognizes several types of relations (see Ruppenhofer *et al.* 2010: 8):

- (i) *Inheritance*, i.e. a child frame inherits the frame elements of a parent frame (e.g. the 'submitting_documents', the 'commerce_pay' and the 'surrendering_possession' are children frames that inherit from the parent frame 'giving');
- (ii) *Using* relation in which the child frame presupposes the parent frame as a background (e.g. the 'offering' frame uses the 'giving' frame; nonetheless, the 'giving' frame is not bound to the 'offering' one).
- (iii) *A perspective on* relation where the child frame offers a particular viewpoint on an un-perspectivized parent frame (e.g. the 'transfer' frame is perspectivized in the 'giving' and 'receiving' frames). The 'transfer' frame is a neutral frame which can be compatible with multiple points of view, while a perspectivalized frame such as 'giving' is consistent only with one perspective: that is why the verb *give* can only involve motion in one direction, from an agent to a recipient and not

from a recipient to an agent (e.g. *give*: giver/agent→transferred entity/patient→recipient/goal versus *receive*: recipient/agent←transferred entity/patient←giver/source).

(iv) *Subframe* relation. A complex frame is made up of sequences of states and transitions which are called subframes. For example, the ‘cause_motion’ frame has the subframes of ‘placing’ and ‘removing’.⁹⁰

(v) The *Causative_of* and *Inchoative_of* relationship (e.g. the verb *corrode* is linked to two frames, namely a ‘corroding_cause’ which is causative of the ‘corroding’ frame).

(vi) The *Precedes* relationship.⁹¹ For example the ‘giving’ frame is preceded by the ‘pre-giving’ frame. A connection could be established between this precedence relation and the Event Identification Condition in the LCM, which explains why it is not possible to use a verb that makes reference to the ‘pre-giving’ frame (e.g. *hold*, a person must hold an object so that he can move it to a recipient) in the dative construction (cf. **She held the bag to me*). Nevertheless, a sentence such as *She held the handset to her ear* displays the syntax of a caused-motion construction but there is no actual motion. This utterance only involves previous motion of the handset from a position off the protagonist's ear to one touching it. *Hold to* is thus metonymic for ‘move the handset from a position off the protagonist's ear to one where the protagonist can hold the handset close to and even touching her ear’, cf. the metonymy RESULT FOR ACTION. This

⁹⁰ In FunGramKB this distinction between frames and sub-frames is contemplated in the Cognicon, which is concerned with low-level cognitive scenarios. Garrido & Ruiz de Mendoza (2011: 108-109) show that a complex script is a sequence of sub-scripts (e.g. @GOING_TO_THE_CINEMA_00 script incorporates the sub-script @PAY_CASH_00).

⁹¹ The precedence relationship between events is computationally modeled in the FunGramKB Cognicon in the form of one of Allen's (1983) temporal relations, i.e. the ‘before’ relation. In this connection, Garrido & Ruiz de Mendoza (2011: 111) illustrate a case of precedence relation in the simple script @PAY_CASH_00. Thus, the scene in which the shop assistant takes the money and opens the till is shown to precede the scene in which the shop assistant puts the money into the till.

metonymy cannot easily license **She held the bag to me*, even if we want to think of the protagonist holding the bag very close to and even touching the speaker, because the bag would have to touch all of the speaker's body. Maybe a cartoon could recreate this fictional scenario, by shrinking the speaker to a bag's size or by enlarging the bag to the speaker's size. Either solution would make the sentence acceptable. Finally, note that the destination of motion/receiver conflation is overridden in *She held the handset to the ear*, since an ear cannot take control of the handset. That is why the expression is possible without the implications of control and possession.

We shall now proceed by discussing each of the aforementioned frames in turn. Before analyzing the FEs for the 'giving' frame, we would like to turn our attention to the reasons FrameNet provides for the assignment of the verb *give* to the 'giving' and not the 'causation' frame. Ruppenhofer *et al.* (2010: 115-116) note that the verb *give* becomes synonymous with *cause* in the sentence *Receiving the notification so late almost gave me a heart attack* (i.e. caused me to have a heart attack). Nonetheless, FrameNet lexicographers rightly point out that not any causal chain is likely to accept the verb *give*. Consider some counterexamples: *??Releasing these old files nearly gave a disaster/Releasing these old files nearly caused a disaster* and **What gave these events?/What caused these events?* The observation put forward by these authors is accurate but needs further discussion. The first example is motivated by the metaphor CAUSAL EVENTS ARE TRANSFERS (cf. Lakoff 1993; Ruiz de Mendoza & Mairal 2007), whereby a causal chain of events is seen as a transfer of possession. This metaphor, which was postulated by Goldberg (1997) in relation to examples such as *The medicine gave me relief*, is a bit too broad and there should be some constraining factors to it. Therefore, the second event, which is caused by the first one, must somehow entail

a possessive relationship between a person and a state, either physical (e.g. *heart attack*) or psychological (e.g. *relief, hope*). In their turn these states are understood as concrete objects that can be possessed through the metaphor STATES ARE POSSESSIONS. In the sentence ??*Releasing these old files nearly gave a disaster* no possessive relationship is entailed because in the first place there is no person involved. Since the potential patient (the one who can be affected by the disaster) is not present, the recipient in the source domain (transfer) cannot be mapped. This blocks the fusion of *give* with this sentence. The LCM contends that there are three cognitive principles underlying the sentence *Receiving the notification so late almost gave me a heart attack*. The first one is the *Mapping Enforcement Principle*, whose function is to ensure “that no item in the target will be discarded if there is a way to find a corresponding item in the source” (cf. Ruiz de Mendoza & Pérez 2011: 181). This principle requires the activation of the STATES ARE POSSESSIONS metaphor to be combined with CAUSAL EVENTS ARE TRANSFERS. There is also a CAUSE FOR EFFECT metonymy (cf. Ruiz de Mendoza & Mairal 2007) in the target of the latter metaphor. The Mapping Enforcement Principle is activated in order to comply with the *Extended Invariance Principle* (the giver is mapped onto causer, the givee correlates with the affected object, the object given corresponds with the causal action, and the possession is mapped onto the effects of the action). This second principle, which was first formulated by Ruiz de Mendoza (1998), ensures that the generic-level structure of the source and target domains of a conceptual mapping are always preserved. The third principle at work is the *Correlation Principle* (Ruiz de Mendoza & Santibáñez 2003), which stipulates that the target domain structure determines what we have to search in the source domain. Thus, the Correlation Principle leads us to choose the best source

domains for the EVENT and STATE targets in the way they relate (the state is a result of the causal action within the event).

The verbs *contribute* and *donate* are subsumed under the ‘giving’ frame that is made up of three core and ten non-core FEs. The core FEs are the Donor, the Recipient and the Theme (e.g. [...] *they may contribute articles to historical journals* [...]; COCA 1987, where *they* is the Donor, *articles* is the Recipient and *historical journals* is the Theme). The ‘giving’ frame proposed by FrameNet is too generic to account for all the selectional restrictions imposed by *contribute* and *donate*. One difference between these two verbs is that the former allows for metaphorical extensions whereas the latter evokes a very specific scenario, i.e. the giving event is restricted only to the context of charitable acts. Take into consideration the sentence *Seasonal rains drenching uplands may have contributed to the water budget* [...] (COCA 1993). This example is motivated by an extension of the basic meaning of the verb *contribute*, based on the low-level metaphor EVENTS ARE PEOPLE. This metaphor licenses the linguistic realization of the Donor as an inanimate entity.⁹² By contrast, the verb *donate* always requires an animate Donor (cf. *Salmon angling contributed/*donated £50m to the Scottish economy* [...]; BNC A4K 649) because of the very narrow context associated to its meaning. Even the sentence *The Bank donated £45,000* [...] (BNC GX9 319) implies that the Donor is necessarily animate. In this example, an inanimate institution metonymically stands for the people who work for that institution and who transfer the amount of money to a given Recipient. In line with the LCM, we postulate that the verb *contribute*

⁹² In the FrameNet database there seems to be an inconsistency between the definition of a Donor (i.e. a person who transfers a theme) and the example illustrating the syntactic behavior of the verb *contribute*: *Salmon angling contributed £50m to the Scottish economy* [...]. Here the Donor is expressed by an activity which metonymically stands for the people who perform it and can act as contributors. Nonetheless, no explanation is provided in FrameNet of what licenses this sentence.

is a radial concept with a basic concrete meaning and several metaphorical extensions.

The related senses are diagrammed in Figure 4.9 below:

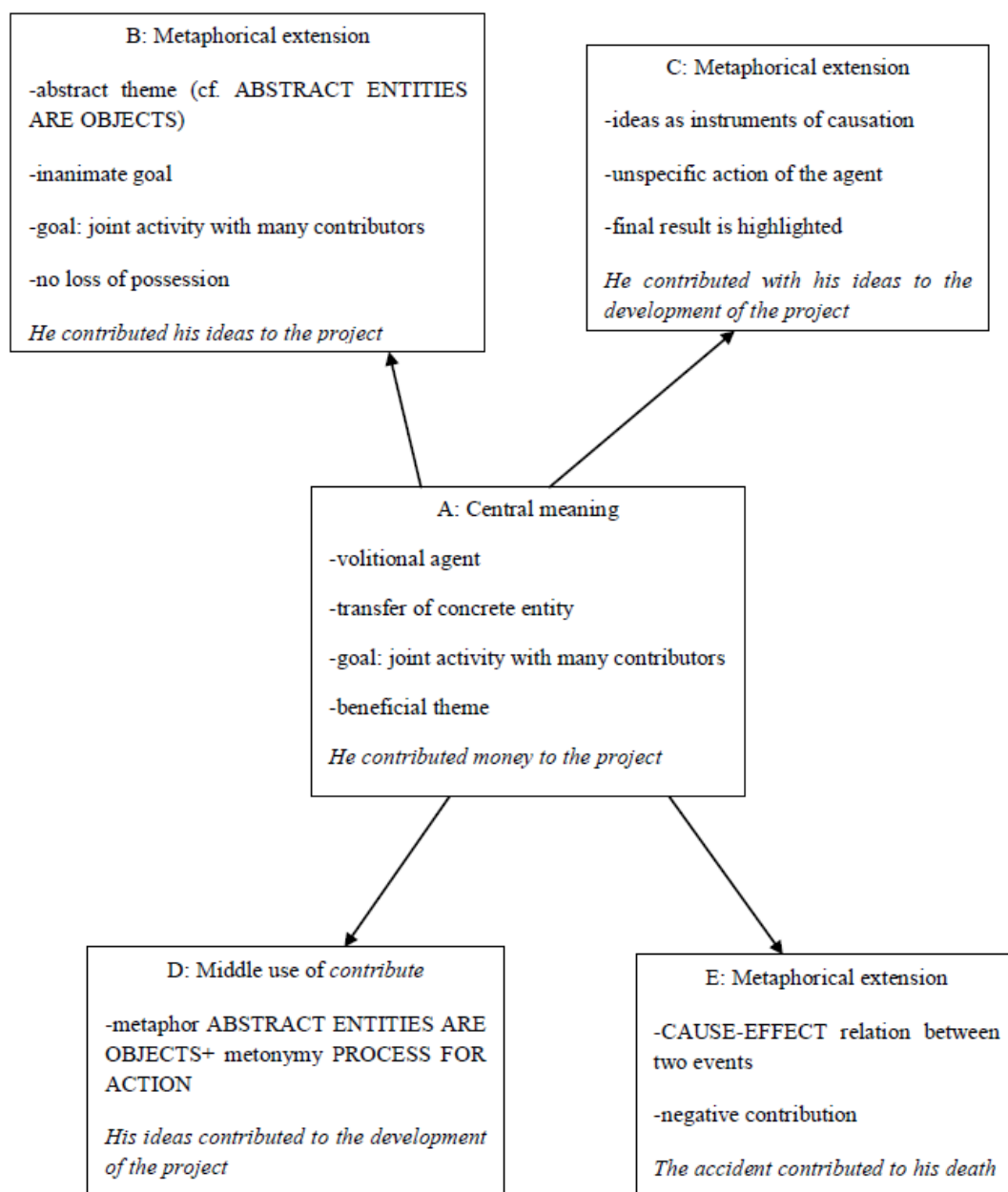


Figure 4.10 Metaphorical extensions for *contribute*

The central meaning involves a volitional agent who gives a concrete theme to a common fund or project, where the theme is beneficial for the recipient and the

presence of multiple givers is backgrounded (cf. *He contributed money to the project*). The sentence *He contributed his ideas to the project* is a metaphorical extension of the basic meaning of *contribute*. The theme is no longer a concrete entity but an abstract entity that is transferred to an inanimate goal. The goal is represented by a joint activity which involves the participation of many contributors. The low-level metaphor ABSTRACT ENTITIES ARE OBJECTS enables us to perceive the ideas as objects that can be transferred through space. The contributor does not lose possession of his ideas as in the case of transferrable concrete entities. What is more, the possession element is not preserved in the metaphorical extension. This override probably arises from the fact that the metaphor selects source structure according to target needs, which is a matter of the Correlation Principle in combination with the Extended Invariance Principle.

Another metaphorical extension can be observed in the sentence *He contributed with his ideas to the development of the project*. Ideas as objects become instruments of causation (he used his ideas to cause the development of the project). However, the action the agent is involved in is not specified. We only have access to the final result, i.e. the fact that the project has developed.

A fourth metaphorical extension relates to the middle use of the verb *contribute*, which is licensed by the metaphor ABSTRACT ENTITIES ARE OBJECTS and the metonymy PROCESS FOR ACTION, e.g. *His ideas contributed to the development of the project*. In this sentence ideas behave like a volitional agent in the sense that they become capable of causing a result by themselves. Our example is similar to an example extracted from Heyvaert (2003), e.g. *The travel pillow fixes to the headrest providing comfortable neck support*. Heyvaert identifies a telic value for this middle construction. The linguistic distance between the two events in the causal chain (cf. **His ideas*

contributed the development of the project) is motivated by the existence of a telic or ‘destiny-oriented’ focus, which is just one of the various uses of the middle construction.⁹³

Lastly, the sentence *The accident contributed to his death* could be considered a negative metaphorical extension of the central meaning. This example does not evoke the ‘giving’ frame anymore since there is no transfer between the two events, but only a CAUSE-EFFECT relation.

FrameNet illustrates only eight non-core FEs for the verbs *contribute* and *donate*:

- (i) The Circumstances (e.g. *The use of the facilities for Saturday evening has very kindly been donated free of charge by the centre*; COCA 1991);
- (ii) The Manner (e.g. *Willses generously contributed to the construction [...]*; COCA 1991);
- (iii) The Means (e.g. *Workers [...] might contribute through the Post Office*; COCA 1991);
- (iv) The Place (e.g. *At Limoges he had ostentatiously donated a cloak [...]*; COCA 1989);
- (v) The Period_of_Iterations (e.g. *[...] three of the six non-fund holding practices contributed data for the whole of these two periods*; COCA 1975);
- (vi) The Time (e.g. *[...] in 1860 he donated the then huge sum of £150,000 towards the restoration of St. Patrick's Cathedral*; COCA);

⁹³ Other values that Heyvaert (2003) mentions in relation to the middle construction are: a quality judgment of the subject entity (e.g. *This car handles like a sports sedan*), the amount of time needed to carry out some process on the subject entity (e.g. *This item usually ships within 2-3 days*), the possibility of a process (e.g. *This umbrella folds up*), and the relevance of a result (e.g. *It washed well, with little shrinkage*).

(vii) The Purpose (e.g. *Anyone wishing to donate items for auction is asked to contact Tony Coleman [...]; COCA 1989*);

(viii) The Reason (e.g. *Others contributed because they saw the restoration of the Fox as stimulating the local economy [...]; Sketch engine doc#1758479*).

As in the case of the verb *swell* in section 4.2.1, the list of FEs is incomplete and could be further expanded through the addition of the following non-core FEs:

(ix) The Role⁹⁴ (e.g. *[...] the theatre and adjacent property [...] were donated as a gift to Lombard in the year 2000; Sketch engine doc#1281618*);

(x) The Instrument (e.g. *Contribute with your effort to the good success of our Congress; Sketch engine doc#58010*);

(xi) The Co_Participant⁹⁵ (e.g. *The indefatigable King [...] contributes with his wife, Tabitha, to many local and national charities; Sketch engine doc#1227944*);

(xii) and the Depictive (e.g. *Next time, I'll contribute with my eyes open; Sketch engine doc#80608, which describes the Donor as being in a particular state during the contribution*)

Levin's (1993) classificatory criterion for verb classes is based solely on their syntactic behavior, whereas in FrameNet predicates belonging to the same frame need not all share the same distributional patterns (cf. Baker & Ruppenhofer 2002). That is why the 'giving' frame can group together verbs like *contribute*, *donate*, and *give*, which exhibit different syntactic behavior, i.e. *donate* and *give* can participate in the ditransitive construction, while *contribute* cannot. Baker & Ruppenhofer (2002) argue

⁹⁴ This extra-thematic FE refers to the role filled by a given participant of the clause headed by the verb.

⁹⁵ The Co_Participant is an extra-thematic FE which is defined as "an entity that participates in a coordinated way in the same event as the primary protagonist" (Ruppenhofer *et al.* 2010: 141).

that in FrameNet verbs are grouped into frames on the basis of shared semantics. But if this database lists only the semantic similarities between verbs, how can we account for the differences in their syntactic behavior? Can we really claim that the verbs *contribute*, *donate*, and *give* are semantically identical and have no features that help us to distinguish between them?

The verb *extend* and *proffer*, together with *offer*, belong to the ‘offering’ frame, which comprises three core FEs, namely an Offerer, a Potential_recipient, and a Theme (e.g. *He smilingly proffered me a cup of watered wine [...]*; COCA 1992, in which *he* is the Offerer, *me* is the Potential_recipient, and *a cup of watered wine* is the transferred Theme). At this point it should be noted that, contrary to Levin’s (1993) predictions, the verbs *proffer* and *extend* do participate in the ditransitive construction (cf. also [...] *you’ve extended me a kind invitation to come to New York City*; Sketch engine doc#1972394). Since the non-core FEs of the ‘offering’ frame overlap with the FEs detailed in the ‘giving’ frame they will not be enumerated again.

Also, an innovative aspect of this database is that it establishes semantic connections between lexical units belonging to different categories. For instance, the ‘commerce_pay’ frame gathers together both verbs (e.g. *pay*, *disburse*, *shell out*) and nouns (e.g. *disbursement*, *payment*). It can be noticed that troponyms of the verb *shell out*, such as *pony up*, *cough up* or *fork out* were left out. As will be discussed later on in connection to other verbs, one of the shortcomings of FrameNet is the narrow coverage of synonymy, antonymy and sub-typing relations between lexical units. This limitation is explained by Ruppenhofer *et al.* (2010: 122), who argue that this database is not intended to duplicate the information that can be found in WordNet (Fellbaum 1998) and other thesauri concerned with paradigmatic associations.

While it is true that the verbs in the ‘commerce_pay’ frame display a similar semantic make-up, they differ with respect to their syntactic behavior, i.e. the verb *pay* can combine with the ditransitive construction (e.g. [...] *he paid me five shillings* [...]); COCA 1993) whereas the verbs *disburse* and *shell out*, as was noted above, cannot (cf. [...] *he *disbursed/*shelled out me five shillings* [...]). The ‘commerce_pay’ frame encompasses five core FEs: the Buyer, the Goods, the Money, the Rate and the Seller. Nevertheless, the verb *disburse* does not always observe this frame. For the sake of clarity, consider the sentence [...] *the Australian literature boards disburse their grants to writers* (COCA). In this example the *Australian literature boards* cannot be considered Buyers but only givers, whilst the *writers* are not Sellers but only recipients. By way of contrast, take the utterance [...] *he disbursed three hundred francs for a wooden leg* [...] (Sketch engine doc#428643). In this sentence *he* becomes the Buyer who pays an amount of money (e.g. *three hundred francs*) in exchange for Goods, i.e. *a wooden leg*. The Seller is left implicit in this example. The Money and the Rate are considered coreness sets since they tend to co-occur (e.g. [...] *the provision says federal highway aid should be disbursed at the \$31.8-billion annual rate* [...]; Sketch engine doc#81552) and the presence of any of them satisfies a semantic valence of the predicator. Furthermore, they do not have to be linguistically realized at the same time for an utterance to be informationally complete and pragmatically felicitous. What we do not understand is why the Rate is as important as any other core participant role, since in the ‘expansion’ frame evoked by the verb *swell* this FE is a non-core participant. At this point a close examination of the coreness criteria established by FrameNet is in order. The criteria for the centrality of a participant role are exemplified below (cf. Ruppenhofer *et al.* 2010: 26):

(i) A core frame element is understood as a conceptually necessary component of a frame. Nonetheless, we consider that centrality is not only a matter of being necessary, but there are other complementary criteria. Besides, centrality comes in degrees; it is not a matter of all or none.

(ii) A core element needs to be overtly specified (e.g. *Susan resembles her mother*, in which the post-verbal complement NP *her mother* is a core element simply because the verb *resemble* requires its overt expression). The LCM disagrees with this criterion since core elements can often be left unspecified through specific constructional realizations for specific meaning purposes. Consider the case of verb *kill*. It needs an object in the transitive construction, but the object can be left unspecified through the deprofiled object construction (*He kills whenever he feels like it*). Or take the verb *open*, which obviously has an agent as a central element, but the agent can be left unspecified in the inchoative, middle and passive (e.g. *The door opened/The door opened easily/The door was opened*). Also, syntactic projection is a matter of realization of meaning, i.e. of giving expression to meaning. Since frame elements are meaning components, their properties cannot be determined by syntactic properties.

(iii) A core element can be an omitted frame element which receives a definite interpretation. Although omitted, the Goal location element in the sentence *John arrived* can be recovered from the context. But if this is so, why can't this criterion give core status to time reference, which is also definite (e.g. *He arrived [early in the morning]*)? Obviously, location is more central than time with respect to *arrive*, independently of definiteness because of semantic criteria: it is a verb involving several interacting spatial schemas, i.e. motion along a path to a destination.

(iv) A frame element that has no formal marking or that has an idiosyncratic formal marking should be core. In other words, FrameNet proponents claim that if an object is introduced by a preposition (i.e. it is formally marked as an oblique object), then it must be a core frame element. However, consider the case of the activity verb *laugh*, e.g. *He likes laughing at his neighbor*. FrameNet theorists would argue that since *his neighbor* is formally marked by the preposition *at*, then the goal element is central. This is not necessarily the case (cf. *He likes laughing*, which focuses on the activity itself, thus, suggesting that the actor is more central than the goal).

Coming back to the Rate FE mentioned above, it should be noted that it does not fit any of the criteria discussed so far since in the first place it is not a conceptually necessary element. Nor does it need to be overtly expressed. It does not receive a definite interpretation because it is not implicit, i.e. it is only informative. The LCM contends that Langacker's (1987) semantic criteria for centrality are better, since they avoid the problem of mixing up levels of description as FrameNet does. Thus, Langacker (1987) lists four criteria to establish centrality: intrinsicness, conventionality (i.e. shared by a community), genericity, and uniqueness. An intrinsic property makes no reference to external entities (e.g. shape as in *A circle is round*). On the other hand, an extrinsic property is conceived by comparison with other entities (e.g. size as in *Your ball is bigger than mine*). Ruiz de Mendoza (2000) contrasts the sentence *The book is heavy* with *This book is a history of Iraq* in terms of degree of centrality. The first example shares all the centrality criteria with the exception of uniqueness (i.e. other classes of items are also characterized by weight). Weight is an intrinsic property of books as physical entities. It is also generic and conventional knowledge that books have weight. The second example observes only the criterion of intrinsicness. However this criterion

is not relevant since the semantic content of a book is a non-physical property of books which cannot be described by comparison with other external entities. The rest of the criteria of centrality are violated: being a history of a country is not a unique, generic or a conventional feature of a book.

The following non-core FEs were found to collocate with the verb *disburse*:

- (i) The Circumstances (e.g. [...] *each superintendent of Indian emigration would be allowed to disburse his own funds* under a system of strict accountability; Sketch engine doc#646932);
- (ii) The Frequency (e.g. *The accounting section receives and disburses child support payments* on a daily basis; Sketch engine doc#369257);
- (iii) The Manner (e.g. *Half the funds were to be disbursed rapidly to support the balance of payments*; COCA);
- (iv) The Means (e.g. [...] *the amount of aid that DAC countries disbursed* through multilateral systems *had remained broadly constant*; Sketch engine doc#412925);
- (v) The Place (e.g. [...] *grants will be disbursed* at the workshop in Flagstaff; Sketch engine doc#1377643);
- (vi) The Purpose (e.g. *Money in this fund could then be disbursed* to enhance programs for conservation of great apes [...]; Sketch engine doc#147858);
- (vii) The Reason (e.g. *A trust may receive, accept, invest, administer, expend and disburse* for its corporate purposes [...]; Sketch engine doc#1435606);
- (viii) The Time (e.g. *The Association's Honorary Welfare Officers disbursed some £1.8m* in 1990 *on behalf of the Fund*; COCA).

Another frame element, not present in the FrameNet description but which should be added to this list, is the Source from which the money is transferred and which does not coincide with the giver (e.g. *And the ADB is scheduled to begin disbursing loans from a \$3 billion Japanese fund in April*; Sketch engine doc#568220).

FrameNet subsumes the verbs *give up*, *relinquish*, *surrender*, and *yield* under the ‘surrendering_possession’ frame, which is composed of three core FEs, namely the Surrenderer, the Theme, and the Recipient (e.g. [...] *she refused last month to relinquish the children to representatives of Federline* [...]; Sketch engine doc#303189, where *she* is the Surrenderer who gives up the Theme, i.e. *the children*, to the Recipient, viz. *representatives of Federline*). As was the case with the ‘commerce_pay’ frame, this frame could be further expanded through the addition of troponyms of the verb *surrender*, such as *forfeit* or *cede*. The verb *relinquish* is associated with eleven non-core FEs:

- (i) The Circumstances (e.g. [...] *when desperate men have gained power they will not relinquish it* without a struggle; Sketch engine doc#836564);
- (ii) The Containing_event (e.g. *The Golden Eagles panted the Cowboys 74-59* [...] *never relinquishing it* as the night moved on; Sketch engine doc#2002658)
- (iii) The Depictive, which describes a core participant as being in a given state during the surrendering event (e.g. *None of these things would she take* [...] *though she relinquished them* with regret; Sketch engine doc#2326560);
- (iv) The Epistemic_stance, which refers to the legal domain within which the surrendering event is operational (e.g. [...] *the party formally relinquished its constitutional monopoly of power* [...]; COCA);

- (v) The Explanation (e.g. *Robert Kellie Douglas [...] took on the task of drafting the Charter petition but relinquished it* on having doubts about many of the six points [...]; Sketch engine doc#909060);
- (vi) The Frequency with which the surrendering event occurs (e.g. [...] *good guys always relinquish that in favor of fighting the immediate battle*; Sketch engine doc#109308);
- (vii) The Manner in which the surrendering event happens (e.g. *The APL gladly relinquished the bird to her*; Sketch engine doc#615413);
- (viii) A Particular_iteration (e.g. *President Earl again relinquished the chair to Vice President Tublitz [...]*; Sketch engine doc#1344147);
- (ix) The Purpose (e.g. *Pratt is relinquishing the position* in order to take advantage of a forthcoming sabbatical leave; Sketch engine doc#244659);
- (x) The Re_encoding which situates the current event within a larger conceptualization expressed by another frame (e.g. [...] *how much equity the founders should relinquish* in exchange for the start-up capital; Sketch engine doc#1917277)
- (xi) The Time (e.g. *The central government finally relinquished President's rule* on Oct. 17 [...]; BNC HL0 859).

Again, this proposal can be completed with another frame element, i.e. the Role, which combines with a Depictive FE (e.g. *Guillaume relinquished Modigliani* as a client *without too much regret*; BNC ANF 952). Framenet annotations for the verb *surrender* comprise three FEs which were not illustrated for the verb *relinquish*, namely the Degree (e.g. [...] *she would completely surrender her life in every respect to Jesus Christ [...]*; Sketch engine doc#116231), the Place (e.g. *Sometimes I miss the things I*

surrendered at the gate [...]; Sketch engine doc#74876), and the Result (e.g. *In the countryside the state effectively surrendered control over vast numbers of its citizens* [...]; Sketch engine doc#629372). Another FE that could be included is the Rate, as can be seen in the example [...] *all foreign exchange receipts were to be surrendered to authorized banks* at the official rates of exchange (BNC ATG 492). In theory, FrameNet distinguishes between the ‘surrendering_possession’ and the ‘surrendering’ frame in which a fugitive presents himself/herself to the authorities to be subject to the criminal process. However, a close examination of the annotations for the verb *surrender* reveals a strong inconsistency between theory and practice, since FrameNet lists examples which belong to the ‘surrendering’ frame under the ‘surrendering_possession’ frame (cf. *Manoon immediately surrendered himself to the authorities* [...]; BNC HLS 948; *Pablo Escobar Gaviria [...] surrendered himself to state authorities* [...]; BNC HL8 692).

The ‘submitting_documents’ frame has three core FEs, i.e. a Submitter, who gives some Documents to the Authority for processing (e.g. [...] *Vilson Ahmeti* [Submittor] *had submitted the resignation of his non-party government* [Documents] *to President Ramiz Alia* [Authority] [...]; COCA). For the discussion of the non-core FEs we will only focus on the most representative verb of this frame, viz. *submit*. Unlike verbs in the ‘surrendering_possession’ frame, the verb *submit* does not allow for metaphorical extensions (cf. *He surrendered/*submitted power to the government*). Since most of the FEs evoked by this frame have already been mentioned, we have decided to exemplify only three non-core FEs, i.e. the Beneficiary (e.g. *I allowed what I proposed to submit on behalf of my friends to become known*; Sketch enginedoc#674004), and the Purpose_of_theme (e.g.[...] *any Training Fund applications submitted within the last four weeks* for courses organized by the Training Division *have already been forwarded to them for attention*), which should not be confused with the Purpose of the action (e.g.

Receipts must be submitted for reimbursement; Sketch engine doc#414248, in which the Submitter of the receipts wants to be reimbursed).

At this point it is important to highlight the position of the LCM towards the FrameNet distinction between purpose of submitter and purpose of theme. Of course, there is a submitter with a purpose and the submitter can be different from the originator of the documents that are submitted. But this is not necessarily so and the submitter's only purpose in any case is generically to make the submission, while the originator of the documents has a specific purpose (e.g. ratification). The list of FEs provided by FrameNet could be further enriched with three more participant roles, namely the Circumstances (e.g. *Prospective applicants must first contact the appropriate Science Programme Officer before submitting a proposal for consideration* under the urgency procedure; Sketch engine doc#34500), the Role (e.g. *We submit as our testimony the attached briefing paper [...]*; Sketch engine doc#1450563), and the Co_participant (e.g. *The report also said materials Holmes submitted with his complaint contradict his allegations*; Sketch engine doc#2097186).

The verb *restore* appears only in the 'rejuvenation' frame, which is just one of the meaning extensions covered by this verb. This semantic frame refers to the action of an Agent or the occurrence of a Cause event that returns an Entity to an earlier state of vigor or strength, e.g. *The redecoration of the Tuileries had restored the palace to its former splendor* (COCA 1991). Nonetheless, FrameNet proponents do not explain why the resultant condition is expressed by means of the spatial preposition *to*. The low-level metaphor STATES ARE LOCATIONS is what allows us to perceive an entity undergoing change as reaching a physical location. Also, FrameNet does not contemplate other meaning extensions of this verb. Consider the sentence *He restored*

the handkerchief to his pocket (BNC FS8 3840). In this utterance a volitional agent moves a concrete entity to a location with the implication that that was the former location of the entity. The verb *restore* can also behave as a change of possession verb as in [...] *the new Emperor restored Bavaria to Henry in 1154* (COCA 1988). In this case a volitional agent transfers rights over a territory (cf. ABSTRACT ENTITIES ARE OBJECTS metaphor) to an animate recipient. The implication is the same as in the previous example: the recipient had the rights in the past.

The verb *distribute* is subsumed by FrameNet lexicographers into the ‘dispersal’ frame in which an Agent (e.g. *Simultaneously French diplomats [...] distributed the bulletins of the Grande Armée [...]; COCA 1993*) or a Cause (e.g. *Water from melting does not evenly distribute around the globe [...]; Sketch engine doc#1107753*) disperses Individuals from a Source (e.g. [...] *they were distributing Bibles out of his house!* Sketch engine doc#799801) to a Goal_area (*A thicker wire allows the current to distribute over a larger area [...]; Sketch engine doc#6121*). We do not understand why the recipient FE is absent from this frame given the fact that entities can also be distributed to people. Furthermore, the list of participant roles can be completed with other FEs, such as:

- (i) The Circumstances (e.g. *Some 450,000 trash bags have been distributed free of cost [...]; Sketch engine doc#53454*);
- (ii) The Role (e.g. *When possible, these materials will be distributed as class handouts; Sketch engine doc#1875673*);
- (iii) The Co_participant (e.g. [...] *families [...] distributed them along with tea [...]; Sketch doc#639642*);

(iv) and the Containing_event (e.g. *Copies of this schedule were distributed at the meeting*; Sketch engine doc#177386)

We claim that the verb *transfer* can also activate the ‘dispersal’ frame as illustrated by the examples *Marriage [...] was the most important means of transferring property between different families [...]* (Sketch engine doc#15182) or *[...] the native term 'hawala' that has come to be synonymous with the most confidential, quick and cost-effective method of transferring huge sums of money across continents [...]* (Sketch engine doc#19489). Again, the list of FEs is incomplete and can be enlarged through the addition of the following FEs:

(i) The Rate (e.g. *The storage specialist will initially offer a removable system [...] capable of transferring data at a rate of 20MBps [...]*; Sketch engine doc#5529);

(ii) The Source (e.g. *[...] I wanted to transfer money from my savings account to my checking account*; Sketch engine doc#4079);

(iii) The Co_participant (e.g. *This portion of the stone was transferred with the rest of the Academy collection [...]*; Sketch engine doc#134083);

(iv) The Circumstances (e.g. *Health Board General Managers remain directly accountable for all sums transferred under these arrangements [...]*; Sketch engine doc#73125);

(v) The Role (e.g. *Money is often transferred electronically as messages*; Sketch engine doc#65771);

(vi) and the Goal (e.g. *The money would be transferred directly into an investment fund [...]*; Sketch engine doc#744339).

4.3.4. FrameNet's limitations

Although the FrameNet database is undoubtedly a useful tool, several limitations have been identified:

- (i) The lexical units in FrameNet are not provided with any phonological, morphological or etymological information. Also, words in the FrameNet database are not associated with any pragmatic features (information about users and user communities, contexts of use, emotional affect, etc.).⁹⁶ By contrast, the FunGramKB lexicon supplies morphosyntactic information about words, such as the inflectional paradigm and the constraints on voice or tense in the verb paradigm, the pronominalization, the detachability of a verb particle, etc. Furthermore, the FunGramKB lexicon includes information about the dialect, the style and the domain of use of a given lexical unit.
- (ii) The use of a small size corpus, such as The British National Corpus, has direct consequences on the distributional pattern of lexical units. As we have demonstrated in the previous section, semantic frames are sometimes incomplete and could be enriched through the inclusion of additional frame elements. In some cases there is a high degree of overlap between frame elements. For instance, in the sentence *This program will not survive [with everybody going in different directions]*⁹⁷ the phrase between brackets can express the Circumstances that facilitate a state of affairs and supply an Explanation for the occurrence of the events described by the verb.

⁹⁶ These disadvantages are also made evident in the work of Atkins *et al.* (2003: 271-272) or in Fillmore, Johnson & Petruck (2003: 248).

⁹⁷ This example has been extracted from Ruppenhofer *et al.* (2010: 147).

(iii) Despite the fact that it postulates inheritance relationships between semantic frames, FrameNet displays a limited kind of paradigmatic information for words. In this database there are no hierarchical arrangements for the hyponyms of a verb. In this connection, frame elements may reflect the complementation pattern of a lexical unit but they do not predict their syntactic behavior. FrameNet does not focus on the peculiarities of a single verb but on the common semantic features of a frame. This broad treatment cannot help us point out the exact semantic properties that determine a difference at the syntactic level. Thus, *contribute* and *give* behave syntactically in a different way, i.e. *contribute* cannot participate in the ditransitive construction, but, according to the FrameNet lexicographers, they belong to the same semantic frame, namely the ‘giving’ frame. The same holds true for *pay* and *disburse*. While the former can occur in the ditransitive construction, the latter can only appear in the dative construction. If they evoke the same frame (viz. the ‘commerce_pay’ semantic frame) how can we account for their different syntax? As shown in the previous section, a given verb can be construed to activate different frames, e.g. *transfer* can belong to the ‘transfer’ frame as well as to the ‘dispersal’ frame.

Chapter 5

Linguistic knowledge and FunGramKB

5.1 Introduction

This chapter establishes a connection between the linguistic tenets of the LCM and the Natural Language Processing (NLP) field by means of a lexico-conceptual knowledge base, viz. FunGramKB (www.fungramkb.com). As discussed previously, FunGramKB solves some of the problems encountered in FrameNet and other relational databases in that it provides morphosyntactic and pragmatic information about lexical units, it avoids language dependency by working with concepts and not words, and it minimizes redundancy by cognitive clustering.

In this chapter we examine how linguistic information is modeled computationally in FunGramKB. Our aim here is to show how the three FunGramKB modules, namely the Lexicon, the Ontology, and the Grammaticon are interrelated. We shall start off with the discussion of the ontological modeling of concepts, since FunGramKB lexicographers are able to describe a lexical entry only if a knowledge engineer has previously introduced this concept in the Ontology, together with its thematic frame and meaning postulate. As mentioned in section 2.10.2, the Ontology is organized into three different subontologies: #EVENTS, #ENTITIES, and #QUALITIES. We are concerned only with the former. Out of the twenty-eight entity-specific change-of-state verbs that we have focused on in this dissertation only four have already been modeled in the Ontology as basic concepts, i.e. +BURN_00, +ROT_00, +INCREASE_00, and +DECREASE_00. The verbs *moulder* and *decay* were agglutinated as lexical units and

not concepts under the basic concept +ROT_00, whereas *wither* and *swell* are related to the terminal concepts \$WITHER_00 and \$SWELL_00. The verb *grow* is agglutinated under the basic concept +INCREASE_00, while the verb *wilt* is linked to the terminal concept \$DROOP_00. These entity-specific change of state verbs are all instantiations of the cognitive dimension #TRANSFORMATION, which comprises two obligatory participants or thematic roles: (i) a Theme, defined as an entity that transforms another entity, and (ii) a Referent, which is an entity that is transformed by another entity. Figure 5.1 below provides a partial view of the hierarchical structure of the cognitive dimension of #TRANSFORMATION, which incorporates the basic concept +CHANGE_00:

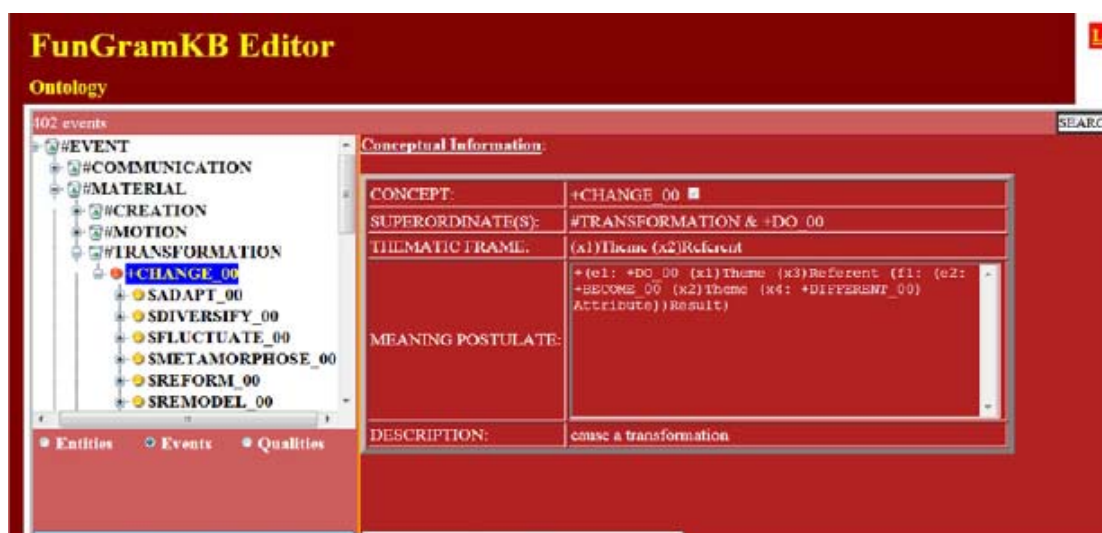


Figure 5.1 Partial representation of the metaconcept #TRANSFORMATION

As for *contribute* verbs, only one of them has been already created in the Ontology, viz. +TRANSFER_00. The lexical unit *disburse* is connected to the basic concept +PAY_00, whilst *surrender* is linked to +GIVE_00. There are no matches in the Ontology for the rest of *contribute* verbs. *Contribute* verbs are represented under the metaconcept #MOTION, which contains four thematic roles: (i) an Agent, i.e. an entity that makes another entity move; (ii) a Theme, i.e. an entity that changes its place or

position; (iii) an Origin, i.e. a location from which an entity moves, and (iv) a Goal, i.e. a location to which an entity moves. Surprisingly, the basic concept +GIVE_00 is hierarchically connected to TRANSFER > MOTION > MATERIAL, as represented in Figure 5.2:

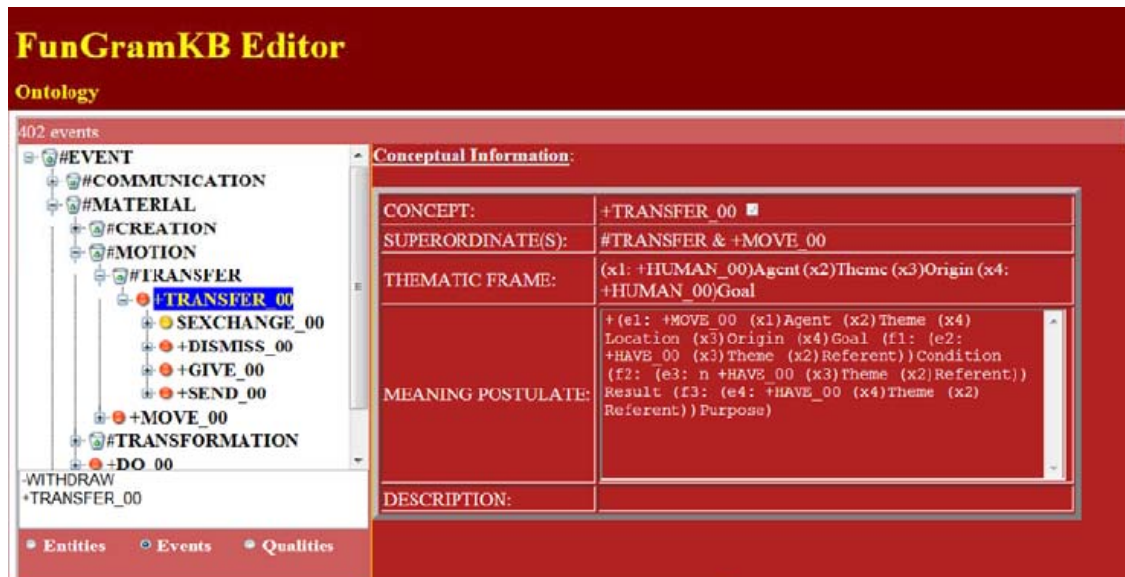


Figure 5.2 Partial view of the cognitive dimension #TRANSFER

Following Van Valin's (2005: 45) inventory of logical structures in RRG, the verb *give* can be classified as active accomplishment, which is assigned three variables (x, y, z):

[do' (x, Ø)] CAUSE [BECOME have' (y, z)]

However, in FunGramKB the thematic frame of the basic concept +GIVE_00 is composed of four arguments:

(x1: +HUMAN_00 ^ +ANIMAL_00)Agent (x2: +CORPUSCULAR_00)Theme
(x3)Origin (x4)Goal

FunGramKB knowledge engineers have included an additional thematic role, namely the Origin, which usually coincides with the Agent, but this is not necessarily so (cf. *Give me the book from the table*, where the Origin is a spatial location, i.e. *the table*). This difference in perspective on the participant roles in the giving event stresses that FunGramKB knowledge engineers are not concerned with linguistic phenomena, but with the cognitive situation encoded by a concept.

In what follows we will describe in detail the steps that have been taken in order to create new terminal concepts for the already existing basic concepts, namely +BURN_00, +ROT_00, +DAMAGE_00, +TRANSFER, and +GIVE.

5.1.1 Ontology modeling

According to Luzondo (2011: 265-267) and Jiménez-Briones & Luzondo (2011), the meticulous process of creation of new terminal concepts can be summarized in three main steps:

- (i) Knowledge engineers must consult several lexicographical dictionaries prior to the introduction of any new predication in the form of meaning postulates (MPs). To preserve the universal status of the Ontology, knowledge engineers must use both English and Spanish dictionaries. When necessary, dictionary definitions will be complemented with our common sense, which may not be mirrored in the lexicographical entries.
- (ii) New terminal concepts or subconcepts must be inserted in the Ontology only when these concepts are characterized by well-marked differentiae, which separate them neatly from their immediate superordinate concept. Since the

Ontology is language independent, no lexical gaps between different languages should prevent the creation of terminal concepts. Also, as noted by Mairal & Perrián (2009a: 222-223), a new concept must be created whenever we encounter at least one lexical item “whose meaning does not match any of the MPs stored in the knowledge base provided that the values of the ontological properties of that concept are shared by all lexical units which are linked to it”.

(iii) Finally, the meaning of the new terminal concept will be coded into the Ontology using the COREL notation. For the insertion of MPs and the potential selectional preferences in the thematic frames (TFs), knowledge engineers can choose from a limited set of concepts (e.g. 1,300 basic concepts) which can sometimes lead to coarse-grained implementations.

We have departed from the basic concept +BURN_00, whose conceptual route is: #EVENT >> #MATERIAL >> #TRANSFORMATION >> +CHANGE_00 >> +DAMAGE_00 >> +BURN_00. As can be observed, the most immediate superordinate of +BURN_00 is the basic concept +DAMAGE_00, which is assigned the TF and MP illustrated in (1):

- (1) TF: (x1)Theme (x2: +CORPUSCULAR_00)Referent
 MP: +(e1: +CHANGE_00 (x1)Theme (x2)Referent (f1: (e2: +BECOME_00 (x2)Theme (x3: +UGLY_00)Attribute))Result)

These TF and MP provide information about the number and type of participants involved in the prototypical cognitive situation of *damaging something*. Thus, an unspecified Theme (x2) changes a three dimensional countable entity (x2; Referent) and, as a result, the Referent becomes ugly (f1). In keeping with the ontological

universality commitment,⁹⁸ the concept +DAMAGE_00 is connected to language-dependent words in four languages, namely English, Spanish, Italian, and French (e.g. *damage, harm, dañar, estropear, danneggiare, ledere, rovinare, sciupare, abîmer, and endommager*).

Coming back to +BURN_00, we notice that the selectional preferences that appear in its TF differ from the ones in +DAMAGE_00, as can be observed in (2):

(2) TF: (x1: +HUMAN_00)Theme (x2)Referent

Thus, the first participant role (x1) is delimited by the selectional preference +HUMAN_00, which tells us that the entity that performs the action can only be a human being. As for the Referent (x2), this refers to any entity that can be set on fire. The structure of the basic concept +BURN_00 complies with the similarity principle according to which all subordinate concepts must share the MP of their superordinate concept (see Periñán & Arcas 2007a). In our case, the inheritance relationship is marked by the presence of the superordinate +DAMAGE_00 in the first predication of the subordinate concept +BURN_00. The MP of +BURN_00 is mapped into the COREL representation in (3), whose natural language equivalent is reproduced in (4):

(3) +(e1: +DAMAGE_00 (x1)Theme (x2)Referent (f1: +FUEL_00)Instrument).

(4) A person (x1) damages an unspecified entity (x2) using fuel as in instrument (satellite f1).

⁹⁸ Periñán & Arcas (2010) postulate seven ontological commitments for FunGramKB: (i) the Ontology is universal, linguistically-motivated and general-purpose; (ii) the Ontology is based on a three-layered model, which groups metaconcepts, basic concepts, and terminals; (iii) the basic and terminal concepts are non-atomic conceptual units in the sense that they are provided with a TF and a MP; (iv) MPs are Ontology organizers; (v) the Ontology builds on an IS-A taxonomic relation; (vi) a conceptual unit can be subsumed into two or more concepts, thus creating complex hierarchies; (vii) non-monotonic inheritance allows the system to override previous statements in the light of additional information.

The MP of +BURN_00 also obeys the specificity principle (Periñán & Arcas 2007a), which stipulates that the MP of a subordinate concept must comprise a distinctive feature (or *differentia*) not present in the MP of its superordinate concept. Hence, the satellite fl (Instrument) is what separates the subordinate concept +BURN_00 from its superordinate concept +DAMAGE_00. Also, the *differentia* in the MP of +BURN_00 has an exclusive value within the metaconcept established by the superordinate concept +DAMAGE_00, i.e. #TRANSFORMATION (cf. the opposition principle).⁹⁹

The first stage in the process of creation of new terminals consists of gathering all the possible synonyms for the basic concept +BURN_00 in English as well as in Spanish. Among the most commonly used dictionaries, we can mention on the one hand, *Longman Dictionary of Contemporary English*, *English Collins Dictionary and Thesaurus*, *Cambridge Advanced Learner's Dictionary*, *Merriam-Webster Dictionary*, *OneLook Dictionary* for English and on the other hand, *DRAE: Diccionario de la Lengua Española* (Real Academia), *CLAVE*, or *Diccionario de Sinónimos y Antónimos* (Espasa Calpe) for Spanish. After consulting these dictionaries, we collected the following English and Spanish synonyms:

English: *cauterize*, *carbonize*, *char*, *combust*, *conflagrate*, *cremate*, *ignite*, *incinerate*, *inflame*, *kindle*, *light*, *scorch*, *singe*, *torch*.

Spanish: *arder* ('burn'), *abrasar* ('sear'), *cauterizar* ('cauterize'), *carbonizar* ('carbonize'), *chamuscarse* ('scorch'), *conflagrar* ('conflagrate'), *encender* ('light'), *incinerar* ('incinerate'), *inflamar* ('inflame'), *prender* ('light').

⁹⁹ Periñán & Arcas (2007a) claim that MPs of ontological concepts in FunGramKB observe the opposition principle, which stipulates that the *differentiae* in the MPs of sibling concepts must be incompatible with one another.

We have discarded the words *scorch*, *parch*, and *agostar* ('parch') because the Theme is non-human.¹⁰⁰ Lastly, the verbs *roast*, *toast*, *sear* and their Spanish counterparts *achicharrar* ('sear'), *asar* ('roast'), *tostar* ('toast'), *abrasar* ('sear') have been agglutinated under the basic concept +COOK_00. After discarding all the verbs that do not share the same *genus* as their superordinate basic concept, we started looking up the definitions of the verbs listed above. A closer inspection of the definitions of the verbs *combust*, *conflagrate*, *ignite*, *inflame*, *kindle*, *light*, *arder* ('burn'), *conflagrar* ('conflagrate'), *encender* ('light'), and *prender* ('light') reveals that they do not add any new features to the basic concept +BURN_00:

Combust

American Heritage Dictionary (AHD): To cause to burn; ignite.

Collins English Dictionary (CED): To burn.

Vocabulary.com (VC): To cause to burn or combust.

Conflagrate

Wiktionary: to set fire to something.

Rhymezone: to cause to start burning.

WordNet 3.0: cause to start burning.

Ignite

Cambridge (C): to (cause to) start burning or explode.

Longman (L): to start burning, or to make something start burning.

Collins Cobuild (CC): when you ignite something or when it ignites, it starts burning or explodes

Inflame

¹⁰⁰Also, these words have already been agglutinated as lexical units under the terminal concept \$WITHER_00, since they are more related to drying something than to burning it.

(AHD): To set on fire, kindle.

Merriam-Webster Dictionary (MWD): To set on fire: kindle.

Wiktionary: To set on fire; to kindle; to cause to burn, flame, or glow.

Kindle

(L): If you kindle a fire, or if it kindles, it starts to burn.

(CC): If you kindle a fire, you light paper or wood in order to start it.

(C): to cause a fire to start burning by lighting paper, wood, etc.

Light

(L): To start to burn, or to make something start to burn.

(CC): If you light something such as a cigarette or fire, or if it lights, it starts burning.

(AHD): To set on fire; ignite or kindle.

Arder ('burn')

(DRAE): Estar en combustión.

CLAVE (CL): Estar en combustión o quemándose.

WordReference (WR): Estar encendido o incendiado.

Conflagrar ('conflagrate')

DRAE: Inflamar, incendiar, quemar algo.

Diccionario el mundo.es: Inflamar, incendiar alguna cosa.

Encender ('light')

(DRAE): Pegar fuego, incendiar.

(CL): Hacer arder, incendiar o prender fuego, generalmente para proporcionar luz o calor.

(WR): Prender fuego.

Prender ('light')

(DRAE): Encender el fuego, la luz u otra cosa combustible.

(CL): Referido al fuego o a la luz, causarlos o encenderlos.

(WR): Hablando del fuego, de la luz o de cosas combustibles, encender o incendiar.

These verbs will be simply connected as lexical units to the basic concept +BURN_00.

Figure 5.3 below shows how the FunGramKB Ontology establishes the link between words, which are language-dependent, and the concept +BURN_00, which is language independent:



Figure 5.3 Lexical units linked to the concept +BURN_00

Other words that are associated with the basic concept +BURN_00 are the Italian verbs *ardere* ('burn'), *bruciare* ('burn'), and the French verbs *brûler* ('burn'), and *enflammer* ('inflamm').

The rest of the verbs do exhibit features that differentiate them from their *genus*, i.e. +BURN_00. Consider the verbs *char*, *scorch*, *singe*, and *chamuscar* ('scorch'), which share similar meanings:

Char

(L): to burn something so that its outside becomes black.

(CC): if food chars or if you char it, it burns slightly and turns black as it is cooking.

(C): to burn and become black or to burn something so that it becomes black

*Scorch*¹⁰¹

(L): if you scorch something, or if it scorches, its surface burns slightly and changes color.

(CC): to scorch something means to burn it slightly.

(C): to (cause to) change color with dry heat or to burn slightly.

Singe

(L): to burn the surface of something slightly, or to be burned slightly.

(CC): if you singe something or if it singes, it burns very slightly and changes color but does not catch fire.

(C): to burn slightly on the surface, without producing flames.

Chamuscar ('scorch')

(DRAE): quemar algo por la parte exterior.

(CL): quemar por la parte exterior o de manera superficial.

(WR): quemar una cosa por la parte exterior.

We can notice from the definitions given above that these verbs display some characteristics that set them apart from the basic concept +BURN_00. They add new information related to the specificity of the burning entity (i.e. a surface), the manner in which the event occurs (i.e. slightly), and the outcome of the event (i.e. the surface becomes black). Since these features cannot be overlooked, we must create a new

¹⁰¹ Regarding the verb *scorch*, the meaning listed here is different from the one which refers to the process of drying undergone by plants under the influence of strong heat or wind.

terminal concept that will depend hierarchically on its most immediate superordinate concept, viz. +BURN_00. We will first label the new terminal concept \$SINGE_00 and we will then continue to store the information concerning the type of participants involved in the burning event. The specificity of the burning entity will be reflected in the selectional preferences of the TF:

(5) TF: (x1: +HUMAN_00)Theme (x2: +SURFACE_00)Referent

Therefore, the entity that burns is human whereas the entity being burnt is a surface of another entity. Once the construction of the TF is accomplished, we proceed to create the MP, whose structure can be divided into two main parts: (i) the first predication (e1), which is identical to the meaning expressed by the superordinate concept +BURN_00, and (ii) the distinct features coded in the form of satellites (f1 and f2):

(6) +(e1: +BURN_00 (x1)Theme (x2)Referent (f1: +LITTLE_00)Manner) (f2: (e2: +BECOME_00 (x2)Theme (x3: +BLACK_00)Attribute))Result)¹⁰²

The COREL representation can be translated into natural language in the following way: a Theme (x1) burns a Referent (x2) slightly (f1) and as a result its surface (x2) acquires a black color (f2). At the final stage we move on to link to this new terminal concept those lexical units codifying the same or related lexical meanings. Thus, the verbs *char*, *scorch*, *singe*, and *chamuscar* ('scorch') will be associated to \$SINGE_00.

Another verb which deserves further consideration is *cauterize*, whose meaning is illustrated below:

¹⁰² At this point it is important to mention that the basic concept +BECOME_00 is used to indicate a change in one of the properties of an entity, such as form, shape, or color. By contrast, the basic concept +BE_01 is employed to express a conspicuous change in an entity. Furthermore, COREL differentiates between +BE_00, which means 'to belong to a class' or 'to have identity with', +BE_01, which highlights inalienable properties, and +BE_02, which is used for locations.

(CC): If a doctor cauterizes a wound, he or she burns it with heat or with a chemical in order to close it up and prevent it from becoming infected.

(C): To burn an injury to stop bleeding and prevent infection.

Macmillan Dictionary (MD): to close a cut by using a hot instrument in order to prevent infection or to stop blood from flowing out.

As can be remarked, the semantic make-up of this verb is too fine-grained to be encoded by its superordinate +BURN_00. It is thus necessary to create a new terminal concept which will be placed immediately under its parent concept. The specificity of the entity that is being burnt will be codified in the selectional preferences of the TF of this new terminal concept, which will be labeled \$CAUTERIZE_00:

(7) (x1: +HUMAN_00)Theme
(x2: +WOUND_00)Referent

Therefore, \$CAUTERIZE_00 indicates that a human being burns a wound. There are two distinguishing properties of the verb *cauterize* that will have to be coded in the form of satellites: (i) the instrument used to perform the action is either heat or a chemical, and (ii) the purpose of the burning action is to cure the injury. With this in mind, the knowledge engineer sets out the task of editing the MP of the new terminal concept, which would look like this:

(8) +(e1: +BURN_00 (x1)Theme (x2)Referent (f1: +HEAT_00 ^
+CHEMICAL_00)Instrument) (f2: (e2: +CURE_00 (x1)Theme
(x2)Referent)Purpose)

(‘A human being (x1) burns an entity (x2) using heat or a chemical as instruments (f1) in order (f2) to cure that entity (x2)’)

The first predication of \$CAUTERIZE_00 (i.e. e1: +BURN_00 (x1)Theme (x2)Referent) is inherited from its superordinate basic concept. Also, we can notice that satellites can be immediately followed by a basic concept (f1) or by another predication and its thematic roles (f2). These satellites add new information related to the cauterization process: the instruments used are heat or a chemical (f1) and the burning event has curative purposes (f2).

The next step consists of connecting semantically similar words to this terminal concept. There are only four lexical units that express the same meaning as this terminal, namely the verbs *cauterize* [Eng], *cauterizar* [Spa], *cautériser* [Fre], and *cauterizzare* [Ita]. The same procedure will be followed for the introduction of three other terminal concepts related to the ‘burning’ scenario, viz. \$INCINERATE_00, \$SCREMATE_00, and \$TORCH_00:

- (9) \$INCINERATE_00: to burn something completely

TF: (x1: +HUMAN_00)Theme (x2)Referent

MP: +(e1: +BURN_00 (x1)Theme (x2)Referent (f1: (e2: +BECOME_00 (x2)Theme (x3: +ASH_00)Attribute))Result)

(‘A human being (x1) burns something (x2) and that entity (x2) turns to ashes (f1: Result)’).

Agglutinated lexical units: *incinerate*, *carbonize*, *calcine*, *incinerar* (‘incinerate’), *calcinar* (‘calcine’), *carbonizar* (‘carbonize’), *carbonizzare* (‘carbonize’), *incenerire* (‘incinerate’), *incinérer* (‘incinerate’), *carboniser* (‘carbonize’), *calciner* (‘calcine’).

- (10) \$SCREMATE_00: to burn the body of a dead person

TF: (x1: +HUMAN_00)Theme (x2: +HUMAN_00)Referent

MP: +((e1: +BURN_00 (x1)Theme (x2)Referent (f1: (e2: n +BE_01 (x2)Theme (x3: +ALIVE_00)Attribute))Condition (f2: (e3: +BE_01 (x2)Theme (x4: +ASH_00)Attribute))Result))¹⁰³

(‘A human being (x1) burns another human being (x2) with the condition (f1) that the Referent (x2) is not alive and as a result (f2) the Referent (x2) turns to ashes (x4)’).

Agglutinated lexical units: *cremate*, *cremar* (‘cremate’), *cremare* (‘cremate’), *incinérer* (‘cremate’).

- (11) \$TORCH_00: to burn a building or other large thing, intentionally and usually illegally

TF: (x1: +HUMAN_00)Theme (x2)Referent

MP: +(e1: +BURN_00 (x1)Theme (x2)Referent (f1: \$LEGAL_N_00)Manner)

(‘A human being (x1) burns something (x2) in an illegal manner (f1)’)

Agglutinated lexical units: *torch*, *incendiar* (‘torch’), *dare fuoco a* (‘set fire to something’), *mettre le feu à* (‘set fire to something’).

The basic concept +ROT_00 is conceptually related to the following verbs: *crumble*, *decay*, *decompose*, *disintegrate*, *fester*, *moulder*, *putrefy*, *descomponer* (‘decompose’), *pudrir* (‘rot’). As in the case of +BURN_00, +ROT_00 displays two thematic roles, a Theme (x1) and a Referent (x2) which is necessarily an organism, as can be noticed in (12):

¹⁰³ The two brackets before the first predication (e1) mark a ‘conceptual binding’ phenomenon (cf. Perrián & Mairal 2010), which establishes a direct correlation between the participants engaged in the two predications that are surrounded by the brackets. In our case, what is being burned (x2) is characterized by the attribute of being dead, i.e. not alive. Also, the *n* polarity operator, which is usually employed in negative statements, modifies here the basic concept +ALIVE_00, thus indicating the condition of the Referent.

(12) TF: (x1)Theme (x2: +ORGANISM_00)Referent

The MP of this basic concept is illustrated below:

(13) +(e1: +DAMAGE_00 (x1)Theme (x2)Referent (f1: +BACTERIA_00)Instrument (f2: m +SLOW_00)Speed)¹⁰⁴
(‘An entity (x1) damages an organism (x2) under the action of bacteria (f1) and the damaging process is gradual (f2)’)

We consider that the verbs *fester* and *putrefy* can be separated from the rest of the verbs enumerated above since they put more emphasis on the bad smell acquired by the rotting entity. Thus, we have linked them to the newly created terminal concept \$PUTREFY, whose resulting TF and MP are:

(14) TF: (x1)Theme (x2)Referent

MP: +(e1: +ROT_00 (x1)Theme (x2)Referent (f1: (e2: +SMELL_00 (x2)Theme (x3: m +BAD_00)Manner))Result)
(‘An entity (x1) rots another entity (x2) and as a result the rotting entity (x2) smells very bad’)

We would also like to discuss the terminal concept \$TARNISH_00, to which lexical units like *tarnish*, *deslustrar* (‘tarnish’), *manchar* (‘stain/tarnish’), *poner negro* (‘tarnish’), *décolorer* (‘tarnish’), *noircir* (‘tarnish’), *obscurcir* (‘darken’), *souiller* (‘soil’), *tacher* (‘stain’), *ternir* (‘tarnish’) are connected, and which narrows down the content of +DAMAGE_00. The Theme of this terminal is restricted to elements such as +AIR_00, +DUST_00, or +DIRT_00 whereas the Referent is always a metal. The conceptual information of \$TARNISH_00 is represented in Figure 5.4:

¹⁰⁴ The letter *m*, placed before the basic concept +SLOW_00, is a relative quantifier which refers to the speed at which the damaging process occurs. Usually quantification operators indicate the exact amount of entities involved in an event: much (m), some (s), and few (p). As stated in section 2.10.2, the list of the quantification operators is included in Appendix III.



Figure 5.4 Conceptual information of the terminal concept \$TARNISH_00

The inheritance relationship between +DAMAGE_00 and \$TARNISH_00 is made evident by the presence of the basic concept in the first predication in the MP of \$TARNISH_00 (i.e. e1: +DAMAGE_00 (x1)Theme (x2)Referent). The differential of this new terminal is encoded in the form of a result satellite, e.g. (f1: (e2: +BE_01 (x2)Theme (x3: p +BRIGHT_00)Attribute))Result). The corresponding translation of this MP into natural language is: a Theme (x1) damages a Referent (x2) and as a result the Referent (x2) becomes less bright (satellite f1).

Finally, it has been decided to create the *contribute* verb *return* as a terminal which inherits conceptual information from the basic concept +GIVE_00. To understand better the MP of \$RETURN_00, we should first have a look at the TFs and MPs of its superordinate concepts, namely +GIVE_00 and +TRANSFER_00, displayed in (15) and (16):

(15) +TRANSFER_00

TF: (x1: +HUMAN_00)Agent (x2)Theme (x3)Origin (x4:
+HUMAN_00)Goal

MP: +(e1: +MOVE_00 (x1)Agent (x2)Theme (x4)Location (x3)Origin (x4)Goal (f1: (e2: +HAVE_00 (x3)Theme (x2)Referent))Condition (f2: (e3: n +HAVE_00 (x3)Theme (x2)Referent))Result (f3: (e4: +HAVE_00 (x4)Theme (x2)Referent)))Purpose)

(16) +GIVE_00

TF: (x1: +HUMAN_00 ^ +ANIMAL_00)Agent (x2: +CORPUSCULAR_00)Theme (x3)Origin (x4: +HUMAN_00 ^ +ANIMAL_00)Goal¹⁰⁵

MP: +((e1: +TRANSFER_00 (x1)Agent (x2)Theme (x3)Origin (x4)Goal (f1: +HAND_00)Instrument) (e2: +BE_02 (x1)Theme (x4)Location (f2: m+NEAR_00)Position) (e3: +BE_00 (x1)Theme (x3)Referent))

The intricate MP of +TRANSFER_00 can be decomposed into three sentences. A human Agent (x1) moves a Theme (x2) from an Origin (x3) to a human Goal (x4), where the Goal overlaps with the final Location (x4). All this is formalized in COREL by means of the first predication or e1. The *sine-qua-non* condition of the transfer (satellite f1) is that the Origin (x3) must own the Theme to be transferred (x2). The result of the transfer is that the Origin (x3) stops having the Theme (x2) so that (satellite f3) the Goal (x4) can have the Theme (x2).

As far as the MP of +GIVE_00 is concerned, this could be interpreted as follows: an Agent (x1) transfers a Theme (x2) from an Origin (x3) to a Goal (x4) using the hand as an instrument (satellite f1: +HAND_00)Instrument). This MP also specifies that the Agent (x1), which is located very near (satellite f2) the Goal (x4), i.e. (e2: +BE_02

¹⁰⁵ Please note that the selectional preferences for the Agent and the Goal participant of the basic concept +GIVE_00 are restricted to either a human being or an animal. As for the object given, this can only refer to a three dimensional countable entity.

(x1)Theme (x4)Location (f2: m +NEAR_00)Position), coincides with the Origin (x3), which in COREL is represented by means of the third predication e3. In this light, \$RETURN_00 inherits its first predication from +GIVE_00 and incorporates a condition satellite f1:

(17) MP: +(e1: +GIVE_00 (x1)Agent (x2)Theme (x3)Origin (x4)Goal (f1: (e2: past +GIVE_00 (x4)Agent (x2)Theme (x5)Origin (x1)Goal))Condition)

The information provided by this MP tells us that the event of returning implies that an Agent (x1) gives a Theme (x2) from an Origin (x3) to a Goal (x4) under the condition (satellite f1) that the entity receiving that Theme (x4: Goal) in the past (the tense operator *past*) gave the same Theme to the entity that is now Agent (x1). Finally, this terminal concept is lexicalized as *return* [Eng], *devolver*, *restituir* [Spa], *rendere*, *ridare*, *restituire* [Ita].

5.1.2 The Lexicon

This section offers a description of the English lexical component, by focusing on the verb *burn*. As mentioned in section 2.10.1, the most relevant part in the lexicon concerns the features related to the LCM Core Grammar, since they enable the system to generate automatically the CLSs of headwords. These properties make reference to the *Aktionsart* of a verb, the number of variables, and the constructions with which a lexical unit combines. The LCM Core Grammar features for the verb *burn* are partially reproduced in Figure 5.5 below:

LCM CORE GRAMMAR:

AktionsArt:

State
 Activity
 Accomplishment
 Achievement

You determine the canonical lexical class(es) of the verb.

Variables: x, y

Idiosyncratic features:

[MR ?], [U = <-- no value selected -->]

Thematic frame mapping:

X = Theme , Y = Referent , Z = [no function]

A REMINDER OF FUNGRAMKB PARTICIPANTS:
 THEME: Entity that, volitionally or not, performs an event.
 REFERENT: Entity that is directly involved in the event caused by another entity.

Figure 5.5 Partial reproduction of the English lexicon

The *Aktionsart* box reveals that the verb *burn* is classified as an accomplishment and a causative accomplishment. It is also important to describe briefly the process that FunGramKB lexicographers carry out in order to determine the membership of a verb to a given *Aktionsart*. Van Valin & LaPolla (1997: 94) propose a set of seven semantic and syntactic tests to determine the class of a verb (see also Cortés, González & Jiménez 2012 for further discussion of these tests). The first test evaluates the compatibility of a verb with the progressive form. As an indicator of [-static], [-punctual], this test helps to discard states (cf. **He is being happy*) or punctual verbs, such as achievements (cf. **The balloon is bursting* with a progressive reading and not future time interpretation: ‘The balloon is about to burst’) or semelfactives (cf. **He is sneezing* with a progressive meaning and not an iterative reading: ‘He sneezes several times’). Only activities (e.g. *She is playing*), accomplishments (e.g. *I am learning*) and active accomplishments (e.g. *She is drinking a glass of water*) allow this test. Since the verb *burn* is possible in the progressive form (e.g. *The fire is burning [...]*; BNC B7G 369), we assume that it is not a state. Nonetheless, we have to apply the rest of the tests to accurately establish the *Aktionsart* of this predicate.

The second test concerns the compatibility of verbs with adverbs like *dynamically*, *energetically*, or *vigorously*, which code dynamic actions. According to Van Valin (2005: 39), the fusion between dynamic adverbs and accomplishments is impossible. Nevertheless, it becomes evident from the example attested in our corpus that this test may not be as accurate as has been claimed (cf. *If the fire is burning vigorously just within the door, it may not be possible to enter through the door [...] ¹⁰⁶*). The third test involves the occurrence of verbs with adverbs like *quickly*, *slowly*, or *rapidly*, which encode duration. As an accomplishment verb, *burn* should be perfectly acceptable with pace adverbs, e.g. *Cover the embers thickly with green fresh leaves: they'll burn slowly with billows of smoke* (BNC ADY 1573). The fourth test offers further confirmation of the results of the third test. The purpose of this test is to ascertain whether a verb has internal duration or not. Only verbs that involve duration can match with expressions such as *for an hour* or *spend an hour X-ing*. As a duration predicate, *burn* can collocate with temporal durative expressions (cf. [...] *a good log will burn for two days [...]*; COCA 1981). According to the fifth test, accomplishments can also happen with expressions that refer to the termination point of an event like *in an hour* or *in ten minutes* (e.g. *The sun here is very strong -- you can burn in an hour*; COCA 1993). The sixth test applies to predicates that can involve a result state. As such they can be used adjectivally as stative modifiers (e.g. *Can you switch the toaster off, put the pancake in or I'll have a burnt pancake*; BNC KCH 3365). Lastly, the causative paraphrase, which is not strictly speaking a test, helps us to determine whether a verb is inherently causative or not. Consider the sentence *The fire burnt*, which does not allow a direct causative paraphrasing (cf. *?The wind burnt the fire* vs. *The wind caused the fire to burn out of control*). Nevertheless, it is possible to construe the verb *burn* as a

¹⁰⁶ Google Books: *Fire engineering* (1942). Accessed on May 3, 2012.

causative accomplishment as in [...] *they burnt the corpse* [...] (COCA 1993). Summing up, all the tests, with the exception of the second one, indicate that *burn* is an accomplishment predicate which expresses an inherently telic and at the same time durative change of state. Since the verb *burn* can be categorized both as an accomplishment and as a causative accomplishment it exhibits two logical structures:

(18) Accomplishment (e.g. *The log burnt*): BECOME **burnt'** (x)

(19) Causative accomplishment (e.g. *They burnt the corpse*): [**do'** (x, Ø)]
CAUSE [BECOME **burnt'** (y)]

Figure 5.5 also shows that the verb *burn* is assigned two variables, i.e. *x* and *y*. This number is determined by the *Aktionsart* with the highest number of variables, which in our case is the causative accomplishment. The next step in the semantic description of a given predicate concerns the specification of the semantic relations holding between the arguments of a logical structure and its verb. RRG groups semantic roles into two classes depending on the level of generality: (i) thematic roles; and (ii) macroroles (MR) (Van Valin & LaPolla 1997; Van Valin 2005). The former are more specific, since they are related to the type of predicate that they combine with, whereas the latter are generalizations across different argument types that have important grammatical consequences. In RRG thematic relations are defined in terms of the argument positions in a Logical Structure (LS). The first two positions in the thematic relations postulated by Van Valin (2005: 53-57) are occupied by the Agent and the Effector. The verb *burn* has an Effector and not an Agent role as its first argument. This is so because the function of Agent requires the presence of a volitional entity which acts intentionally and controls his/her actions. By way of illustration, consider the sentences in (20):

(20) a. *The woman burnt her skin.*

- b. *The woman intentionally burnt her skin.*
- c. *The woman accidentally burnt her skin.*
- d. *The acid burnt her skin.*

These examples show that the burning event can be carried out by a non-volitional perpetrator as in (20c) or a non-volitional inanimate entity as in (20d). In RRG terms the entity that is being burnt would be assigned the thematic role of Patient. Nevertheless, in FunGramKB the Effector is mapped onto the Theme whereas the Patient correlates with the Referent, as we could observe in Figure 5.5.¹⁰⁷

Van Valin (2005: 58) posits an Actor-Undergoer Hierarchy whereby the position of the variable within a logical structure is fundamental to determine its macrorole status. According to this hierarchy, in the LS of a predicate with two arguments, the leftmost argument will be the Actor and the rightmost one will be represented by the Undergoer. Therefore, the Effector of the burning event corresponds to the Actor macrorole whilst the Patient is the Undergoer. The number of macroroles of a verb is, by default (cf. Van Valin 2005: 63-65 for some exceptions), given by the number of the arguments in its logical structure. The LS of the causative accomplishment in (19) has two variables (x, y), which indicates that the verb *burn* will take two macroroles.

Following Jiménez & Pérez (2011) on collocates for the verbs *sport*, *lucir* ('sport'), and *ostentar* ('flaunt'), we have explored the collocations of the verb *burn* by looking for its most typical combinatory patterns in the COCA. After examining 117 examples, we can conclude that the most frequent subject selected by the verb *burn* refers to people (e.g. *militants*, *crowds*, *farmers*, *Daddy*, *hooligans*, etc.). The Theme that performs the burning event can also be occupied by NPs, such as *the acid*,

¹⁰⁷ These semantic functions employed within FunGramKB stem from Halliday's (1985) typology of processes and Dixon's (1991) semantic types. For a comparison between the taxonomy of thematic roles in the three approaches, the reader is referred to Perićán & Mairal (2010).

batteries, fire, sun, or fireworks. Among the most frequent entities that can undergo burning, we can enumerate food (e.g. *toast, steak, cakes, taters*), places (e.g. *town, city, village, field*), buildings (e.g. *house, church, theatre, factory, hangar*), paper (e.g. *registers, letter, photographs, envelope, files, copies, works, books, bills*), people (e.g. *garrison, fleet, archbishop*), body parts (e.g. *skin, head, stomach, finger, bowel*), and other entities (e.g. *paint, candle, oil, carpet, car, flag, etc.*). Caution has been taken in the selection of the examples since the burning entity is not always encoded by means of a direct object. Consider examples like [...] *she burned the address into the wall with a laser* (COCA 1991) or *She lit a cheroot to calm herself, and promptly burned a hole in her dress* (COCA 1991). In both of them the entity that undergoes burning is the wall and the dress, respectively, whereas the direct object *address* and *hole* represent the result of the burning action. The collocates of the verb *burn* can be found in the LCM Core Grammar block of the English lexicon, in the collocations slot, as illustrated in Figure 5.6 below:

Prepositions:							
X =	aboard	Y	Y =	aboard	Y	Z =	aboard
	N			N			N
Collocations:							
X =		Y	Y =		Y	Z =	
	N			N			N
	acid			archbishop			
	batteries			bills			
	crowds			books			
	farmers			bowel			
	fire			cakes			
	fireworks			church			

Figure 5.6 Collocations of the verb *burn* in FunGramKB

With respect to the constructional behavior of the verb *burn*, we can mention the causative/inchoative alternation (e.g. *The fire burned the theatre/The theatre burned*),

the way object construction (e.g. [...] *the brandy burnt* its way down her throat; COCA 1993), the resultative construction (e.g. [...] *her husband burned* to death in a mystery fire in the same house; COCA 1993), the caused-motion construction (e.g. *He and Buccleuch then went to Hector of Hardlaw's house and burned* it to the ground; COCA 1990) and its intransitive counterpart, i.e. the intransitive motion construction (e.g. *The building is particularly dangerous because there were nine or ten separate fires, which have burned* through the floors; COCA).

5.1.3 The Grammaticon

We will conclude this chapter by illustrating how the CLS Constructor establishes a connection between the three modules, i.e. the Lexicon, the Ontology, and the Grammaticon. In order to illustrate the relationship between CLSs and COREL conceptual schemes consider the sentence in (21), whose corresponding CLS is reproduced in (22):

(21) *John broke the window.*

(22) <_{IF} DECL <_{TNS} PAST < do (%JOHN_00-Theme [+BREAK_00 (%JOHN_00-Theme, +WINDOW_00-Referent)])

The CLS in (22) will be transduced into a COREL representation so that it can be enriched by the knowledge stored in the FunGramKB meaning postulates. The outcome is the predication in (23):

(23) +(e1: past +BREAK_00 (x1: %JOHN_00)Theme (x2: +WINDOW_00)Referent)

The next step consists in interpreting the utterance in (21) by making use of the predications displayed in (24), (25), and (26), which are integrated into the COREL representation in (23) by means of inheritance mechanisms:

(24) +(e1: +DAMAGE_00 (x1: %JOHN_00)Theme (x2: +WINDOW_00)Referent (f1: (e2: +SPLIT_00 (x1: %JOHN_00)Theme (x2: +WINDOW_00)Referent))Result)

(25) +(e1: +CHANGE_00 (x1: %JOHN_00)Theme (x2: +WINDOW_00)Referent (f1: (e2: +BECOME_00 (x2: +WINDOW_00)Theme (x3: +UGLY_00)Attribute))Result)

(26) +(e1: +DO_00 (x1: %JOHN_00)Theme (x3)Referent (f1: (e2: +BECOME_00 (x2: +WINDOW_00)Theme (x4: +DIFFERENT_00)Attribute))Result)

The representations above are in fact the MPs of the basic concepts +BREAK_00 and its superordinate concepts, namely +DAMAGE_00, and +CHANGE_00. These MPs also comprise the selectional preferences specified by the TFs of their corresponding basic concepts. However, we have replaced the default selectional preferences with the values provided by the original text in (21). For example, in the case +BREAK_00 or +DAMAGE_00 the selectional preference for the Referent. i.e. +CORPUSCULAR_00 has been replaced with +WINDOW_00. On the basis of conceptual enrichment the reasoning engine is capable of inferring that: (i) John carried out an unspecified action

and as a result the window became different (cf. predication 26); and (ii) John damaged the window by splitting it (cf. predication 24). Moreover, the CLS in (22) can be further enriched by the semantic properties of the basic concept +WINDOW_00, as specified in (27):

(27) *(e1: +BE_00 (x1: +WINDOW_00)Theme (x2: +ARTIFICIAL_PART_00)Referent) *(e2: +BE_01 (x1)Theme (x3: +GLASS_00)Attribute) *(e3: +ENTER_00 (x4)Agent (x4: +LIGHT_01)Theme (x1)Location (x5)Origin (x6)Goal)

From the MP above the FunGramKB reasoner can also infer that a window is an artefact made of glass and its purpose is to allow the entrance of light. Thus, the reasoning engine will also infer that what is actually broken is the window's glass not its shutters.¹⁰⁸ The intricate procedure behind the construction of a CLS can be graphically represented in Figure 5.7 below:¹⁰⁹

¹⁰⁸ In the LCM this piece of information is obtained through low-level metonymy cued by the verbal predicate.

¹⁰⁹ Before handing in this dissertation, this procedure for the automatic construction of a CLS was under revision. Perriñán (2012) envisages a manually predefined system based on a lexical grammar with attribute-value pairs, where the CLS will be mapped onto the COREL scheme to obtain a fully-fledged semantic representation of the input sentence. ARTEMIS is the prototype program on which Perriñán is working so that CLSs can actually be built from simple sentences.

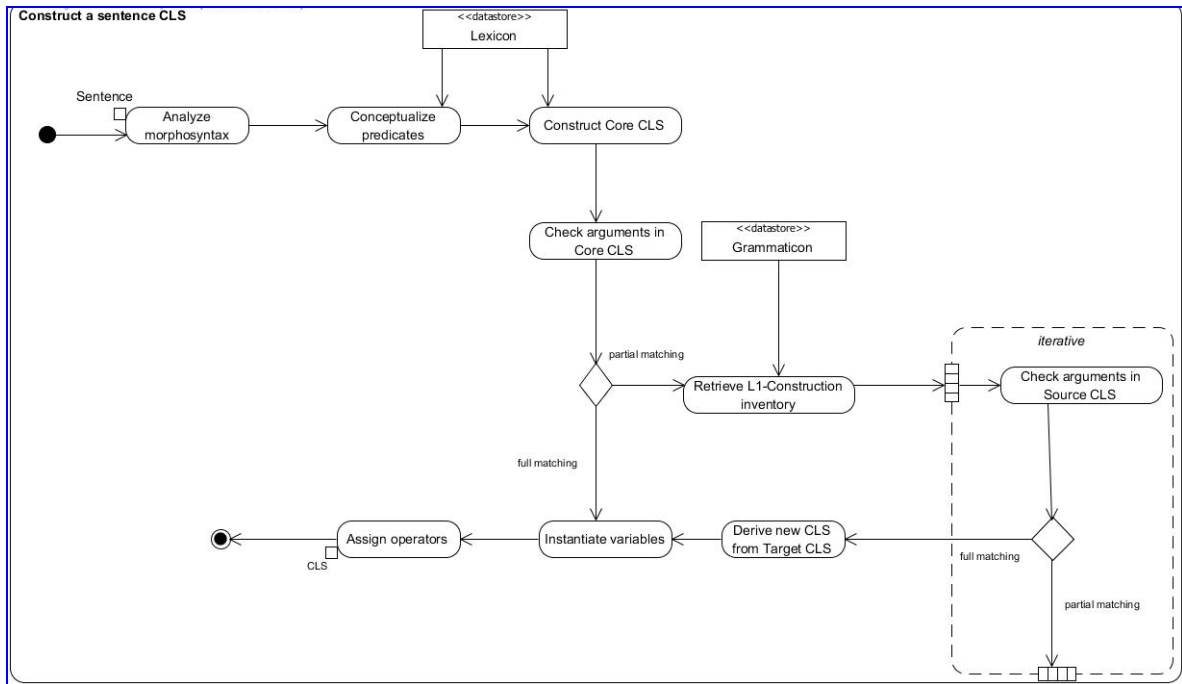


Figure 5.7 Stages in the construction of a CLS (Mairal 2012)

First, the morphosyntax of the sentence is analyzed. For instance, the example in (21) is decomposed into $[[S[NP[John]]][V[break]][O[NP>window]]]$. Next, the semantic knowledge stored in the Lexicon is retrieved, i.e. the *Aktionsart*, the number of variables, the thematic frame mapping, the type of constructions. With this information a core CLS is constructed. In our case, the CLS is $[+BREAK_00$ (x-Theme, y-Referent)]. Lastly, the Theme and Referent variables are replaced with the values supplied by the sentence in (21), i.e. %JOHN_00, and +WINDOW_00. Special mention should be made of the fact that when there is full matching between the information in the core CLS and the input text, the reasoning engine will not check the information stored in the Grammaticon. This is precisely the case with the example in (21). However, when partial matching occurs, the Grammaticon will be checked, retrieving all the information in the L1-Constructicon until full matching is achieved. This can be exemplified with the construction below.

Within the L1-Constructicon, we will focus on the representation of the English caused-motion construction in FunGramKB as shown in Figure 5.8:

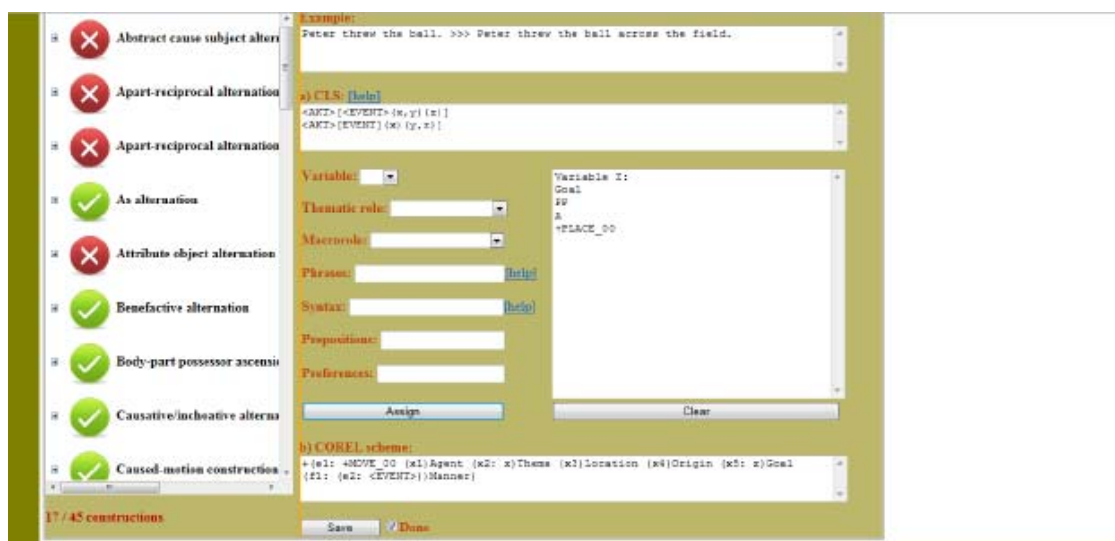


Figure 5.8 The caused-motion construction in the L1-Constructicon

As stated previously, the CLS Constructor retrieves lexical and conceptual information about a given predicate (i.e. its *Aktionsart*, the number of variables, its thematic roles, its constructional patterns) and generates a CLS. Let us illustrate how this works for the caused-motion construction by considering the example *The fire burnt the house to the ground*. First, this sentence will be broken down into `[[S[NP[fire]]][V[burn]][O[NP[house]]][O[PP[to the ground]]]]`. Second, all the information gathered in the Lexicon and the Ontology will be incorporated. For example, the information related to the verb *burn* concerns on the one hand, the knowledge stored in the Lexicon (i.e. its *Aktionsart*, its number of variables, its thematic frame mapping) and on the other hand, the knowledge included in the Ontology (i.e. its TF and MP). With this information a core CLS is constructed: `[+BREAK_00 (x-Theme, y-Referent)]`. When the Theme and Referent variables are checked in the core CLS and replaced with the values `+FIRE_01` and `+HOUSE_00` from the Ontology, a mismatch occurs, since there is a third argument in the input text (*to the house*) that cannot be

accommodated in this core CLS. At this point it is when the L1-Construction is retrieved and searched for a construction that completely matches the input text. When it is found, in this case the caused motion construction, a new CLS is derived, as in (28).

(28) <_{IF} DECL <_{TNS} PAST <do (+FIRE_01-Theme [+BURN_00 (+FIRE_01-Theme, +HOUSE_00-Referent)]) (+ASH_00-Attribute) CAUSE [+MOVE_00 (+FIRE_01-Agent, +ASH-Theme, +GROUND_00-Goal)]

It is important to stress again that the CLS is a syntactic representation which includes the participants as input for the parser, whereas the COREL schema is the semantic interlingua which is the input for the reasoning engine. The CLS in (28) will be then mapped into the COREL schema in (29):

(29) +(e1: past +BURN_00 (x1: +FIRE_01)Theme (x2: +HOUSE_00)Referent (f1: (e2: +BE_01 (x2: +HOUSE_00)Theme (x3: +ASH_00)Attribute))Result (e3: +MOVE_00 (x1: +FIRE_01)Agent (x4: +ASH_00)Theme (x5)Location (x6)Origin (x7: +GROUND_00)Goal))))

The representation in (29) can be given the following interpretation: the fire (x1) burned the house (x2) and as a result the house (x2) turned to ashes (x3). Consequently, the ashes (x4) moved to the ground (x7).

What is more, the MPs of the basic concepts +FIRE_01, +HOUSE_00, and +GROUND_00, which are reproduced in (30), (31), and (32), will also be retrieved from the Ontology:

- (30) +(e1: +BE_00 (x1: +FIRE_01)Theme (x2: +OCCURRENCE_00)Referent)
 +(e2: +BURN_00 (x3: +HUMAN_00)Theme (x4)Referent (f1: x1)Scene)
- (31) +(e1: +BE_00 (x1: +HOUSE_00)Theme (x2: +BUILDING_00 &
 +DWELLING_00)Referent)
- (32) +(e1: +BE_00 (x1: +GROUND_00)Theme (x2: +NATURAL_OBJECT_00
 & +SUBSTANCE_00 & +SOLID_00)Referent)

From these COREL representations the reasoning engine can infer that (i) a person might have started the fire (cf. predication 30); (ii) people could have been in the house when the burning event occurred (cf. predication 31), and (iii) the ground is made of solid matter (cf. predication 32).

It is worth pointing out that, although FunGramKB is an invaluable conceptual knowledge base, it cannot equal the intricate reasoning carried out by the human brain. Since FunGramKB cannot formalize constraints, it needs to specify many more constructions, like Boas does. Also, it cannot deal with metaphoric or metonymic extensions of either low-level or high-level constructs. However, it has incorporated the LCM constructional architecture into its Grammaticon, which allows FunGramKB to operate with lexical-constructional subsumption at least on a limited (but computationally feasible) basis.

Chapter 6

Conclusions

This last chapter gives an outline of the main results and conclusions that can be derived from the analysis of the conceptual domains of change and change of possession in English. It will also provide the reader with a number of suggestions for future research in connection with the topic of this dissertation.

We will now reconsider the initial aims of this research and assess to what extent they have been met. One of our aims was to examine the syntactic expression and the conceptualization of the domains of change and change of possession, with special emphasis on two main verb classes, namely entity-specific change-of-state verbs and *contribute* verbs. To this end, it was essential to find the most appropriate theoretical framework that could provide accurate explanations for the mixed nature of the interaction between low-level configurations and high-level constructions. In this connection, chapter 2 focuses on seven of the most notable Construction Grammar linguistic models and supplies solid evidence for the non-suitability of these constructionist approaches as potential theoretical frameworks for our dissertation. Besides drawing attention to the shortcomings of these constructional stances, each section highlights the points of convergence and divergence between these accounts and the model upon which this dissertation relies, i.e. the LCM. Thus, Fillmore's Case Grammar is dispreferred because, in contrast to the LCM, it rejects compositionality of constructions and relegates to the background the non-idiomatic argument structure constructions, which are precisely our main interest in this research.

The present dissertation also draws from Lakoff's (1987) constructionism with regard to the semantic predictability of syntax and the organization of grammatical constructions in radial networks with a prototypical member and less central members linked by means of metaphorical or metonymic extensions. Nevertheless, Lakoff's (1987) involvement in the field of Construction Grammar was rather incidental: this author limited himself to an isolated case study of 'there' constructions, which was not further pursued or developed for other types of constructions.

Even though Langacker's Cognitive Grammar offers insightful ideas (e.g. the notion of focal prominence/construal, the transparency and compositionality of constructions, the meaningfulness of grammar), this author does not put forward a fully-fledged model of language and inclines the balance too much in favor of low-level expressions while playing down the importance of high-level configurations. Goldberg (1995) adopts a radically different position which attributes the overall meaning of a sentence to high-level constructions rather than to the individual lexical items making up that sentence. However, this is not an unproblematic account. If the motional reading of the sentence *She sneezed the foam off the cappuccino* were contributed solely by the caused-motion construction, as Goldberg seems to suggest, why cannot we integrate similarly related verbs into the same construction (cf. *She ?breathed/?wheezed/?belched/?yawned the foam off the cappuccino*)? It is not our intention to postulate a new meaning for the verb *sneeze* (i.e. 'to cause an entity to move by sneezing at it') but to show that the semantic make-up of *sneeze* is more compatible with a caused-motion construction than that of verbs like *breathe*, *wheeze*, *belch*, or *yawn*. The generic meaning of *sneeze* is 'to expel air forcibly from the mouth and nose in an explosive spasmodic involuntary action' (*American Heritage Dictionary*). Therefore, the force of air expulsion is what makes it possible to construe a situation in

which a violent release of air causes the removal of frothy bubbles off the surface of a liquid. The semantic information encoded by this predicate places restrictions on the nature of the Y element (cf. the Predicate Argument Conditioning constraint in the LCM) which can only be occupied by light entities (cf. *He sneezed ?the plate/?the tray off the table*). The direction of air motion also plays a relevant part in the incorporation of a given verb into the caused-motion construction. The verbs *breathe*, *wheeze*, *yawn* cover both the inhalation and exhalation process. But the caused-motion construction can only fuse with verbs depicting a single flow of energy moving from an *energy source* to the final *energy sink* (cf. the *billiard ball model* propounded by Langacker 1991ab). Since only *sneeze* and *belch* make reference to the exhalation process, they could be regarded as potential candidates for the caused-motion construction. Another factor that contributes to the incompatibility between verbs like *breathe*, *wheeze*, *belch*, *yawn* and the caused-motion construction is that these verbs profile a different aspect of air expulsion: its gentleness (*breathe* ‘to move or blow *gently*, as air’, *yawn* ‘to open the mouth wide and take a lot of air into the lungs and *slowly* send it out’) or the noise it produces (*wheeze* ‘to breathe with difficulty, producing a *hoarse whistling sound*’, *belch* ‘to let air from your stomach come out through your mouth in a *noisy way*’). One major problem arising from Goldberg’s (1995, 2006) account is that her broad generalizations do not help us to discern why some verbs combine more easily with a given construction while others do not.

It is true that in some cases constructions constitute better meaning predictors than verbs. Thus, the transfer meaning of the sentence *John kicked Tom the ball* is clearly supplied by the ditransitive construction which augments the quantitative valence of the predicate *kick*. Nonetheless, the overall meaning of an utterance is not always determined by constructions. For instance, the verb *cost* in the sentence *The mistake*

cost him his job is capable of cancelling out the successful transfer interpretation of the ditransitive construction. Rosca (2012d) also demonstrates that in the case of verbs like *feed* or *pay* (e.g. *I fed him*, *I paid him*) the transfer meaning is not conveyed by the ditransitive construction. The purpose of the ditransitive construction is that of parametrization of the transferred entity (e.g. *I fed him milk*), its amount (e.g. *I paid him \$300*) or the medium (e.g. *I paid him dollars*). Also, in the case of these two verbs we witness a perfect match between the constructional meaning and verbal semantics (cf. the Full Matching constraint in the LCM). Contrary to Goldberg (1995, 2006), the LCM embraces a broader perspective on the division of labor between verbal semantics and constructions, since it does not disregard the importance of rich semantic information provided by verbs. The Internal Variable Conditioning constraint states that the internal variables of a predicate can also constrain the nature of its constructional arguments. Hence, the verb *gather* puts emphasis on the homogeneity of the result of the process of bringing things together. Because of this, *gather* is only compatible with a Z element that depicts a coherent whole, as in *She gathered her straggly hair into a bun* (see also Rosca 2012c for more details).

The typological nature of Croft's Radical Construction Grammar (RCG) and his rejection of syntactic relations between constructional elements have prompted us to dismiss his explanatory apparatus as a potential theoretical framework for the present dissertation. Boas's constructionism coincides with the LCM in the importance accorded to verbal semantics as a source of syntactic explanation and predictability. However, the main inconvenience of Boas's lexico-syntactic approach is that it postulates an excessive amount of 'mini-constructions' and avoids the discussion of figurative constructional uses on account of their low productivity.

The main discrepancy between Embodied Construction Grammar (ECG) and the LCM is that the former is concerned with language processing while the latter focuses on language production. The computational model proposed by Fluid Construction Grammar (FCG) bears no resemblance to the computational implementation of the LCM, viz. FunGramKB. Also, the formalism of FCG is not well-developed enough to explain the subsumption processes between verbs and constructions.

All the weaknesses of the linguistic models reviewed so far reveal that we need a more powerful constructionist approach which can account for the intricate constructional behavior of predicates. For this purpose we have made use of some of the explanatory and analytical tools of the LCM, which studies precisely the principles that regulate the interaction between lexical items and constructions while it strives to strike a balance between the roles of low-order and high-order constructs. Unlike Goldberg or Boas, who devote themselves exclusively to the examination of lower-level or high-level schemas, the LCM embraces two other criteria for the taxonomy of constructions: idiomaticity/eventivity (e.g. the resultative is an eventive construction whereas *What's X Doing Y?* is an idiomatic construction with fixed and variable elements) and meaning construction stratification (e.g. four levels of meaning description: argument structure, implicational, illocutionary, discursive). In keeping with the principles, processes and structures postulated within Cognitive Linguistics, the LCM, in contrast to other lexical-constructional approaches (e.g. Boas 2008ab, Iwata 2005, Nemoto 2005), gives more prominence to empirically validated cognitive notions, such as conflation, high-level metonymy and metaphor. Lastly, a major advantage of this model is its intention to connect the linguistic realm with the computational one by joining forces with the Artificial Intelligence project FunGramKB.

In chapter 4, we have analyzed the factors that license or block out the fusion between, on the one hand, entity-specific change-of-state verbs and a wide array of constructions (i.e. the intransitive locative/temporal/frequency, intransitive resultative, intransitive causal, intransitive motion, causative, caused-motion, resultative, and *way*-constructions) and, on the other hand, *contribute* verbs and the dative/ditransitive constructions. With respect to entity-specific change-of-state verbs, we have shown that this verb class exhibits a richer distributional range than has been attested in the literature (Levin 1993, Wright 2002). Thus, the constructional pattern of these verbs is not restricted to the inchoative/causative alternation. For accuracy purposes, entity-specific change-of-state verbs have been divided into three main categories by taking into consideration their conceptual similarity and the change schemas they use: (i) the first group refers to an increase in size (e.g. *bloom, germinate, swell, blister*, etc.) and selects an A>A' resultative schema indicating the acquisition of a new property (e.g. *Gorse blossomed gold on magnesium limestone embankments*; COCA 1994); (ii) the second group, which describes a decrease in size or a negative, destructive change usually altering the integrity of an entity (e.g. *burn, rot, rust, wither*, etc.), can combine either with an A>A' resultative schema (e.g. *If it can't be unscrewed (it may well have rusted solid), cut through the bolt with a junior hacksaw flush*; COCA 1992) or an A>B schema (e.g. *The spinach wilted into nothing*); and (iii) the verb *ferment* does not belong to any of the two groups mentioned above since it does not depict an increase in size or a necessarily negative change of state. The change schema used by this verb is A>A' (e.g. *The wine fermented into vinegar*, where wine and vinegar are both liquids). These change schemas, which have been borrowed from Ruiz de Mendoza & Luzondo (2011), have proved extremely helpful for the inspection of the intransitive resultative and resultative constructions. The intransitive resultative construction can express either a

simple or a compound result. The former can be lexicalized by an AP (e.g. [...] *a series of concentric burns blistered black* [...]; [...] *the crops rotted black in the ground*) or a PP (e.g. [...] *this encounter blossomed into the most intense relationship of Goldman's life; Linen and lace had rotted into cobwebs on the beds* [...]). The latter can be encoded by means of a combination between an adverb and an AP (e.g. *Their throats would swell out big* [...], where the AP *big* further specifies the result denoted by the adverb *out*) or a combination between an adverb and a PP (e.g. [...] *she had blossomed out into a lovely womanhood* [...]; [...] *the upper parts of alder piles have been eroded down to a flat plain*, [...]). An interesting finding relates to Luzondo's (2011: 221) statement that the A>B schema cannot be realized in the form of an AP. This author's claim seems to be invalidated by an example that we repeat here for the sake of convenience: *His room grew dark; the fire burned dead* [...]. In this utterance a transcendental change of state (from existence to non-existence) is expressed by means of an adjective (i.e. *dead*). Moreover, we demonstrate that the A>A' schema can also be codified by a prepositional resultative (e.g. *Scholz took out a meerschaum pipe that was burned to a dark orange and blew through it*; COCA 1982). It has also been noted that on some occasions the AP expressing a change of color can be syntactically separated from the verb by means of prepositions, such as *in* or *into*. A sentence like *The flower bloomed in motley red* is liable to a part-affectedness interpretation in the sense that the color that covers the surface of the flower displays different hues.

The intransitive causal construction is realized at the syntactic level by the configuration NP1 V *with/in/from/under* NP2, where NP2 indicates the cause of the event described by the verb. The second NP can be an event (e.g. [...] *their citizens' privacy rights are eroded* with the initiation of the Decode deal; Sketch engine doc#18108), a location (e.g. *The camera blossomed* in the hands of indigenous

photographers [...]), an emotion (e.g. *And the mother's heart swelled big with anguish*) or a state (e.g. *Frescoes generally became dark or decayed from moisture*). The first group of verbs is more productive with causal prepositions such as *in* and *with* whereas the prepositional gamut for the second group is richer (e.g. *Do not tarnish your badge with a stain of corruption; [...] the petunias wilt in the heat [...]; But bells now rust from inactivity; Less-sturdy pans might wilt under excessive heat [...]*). In order to motivate the use of spatial prepositions to express causality, the LCM posits the existence of conflational continuums: location in a container > possession of object> instrumentality> causation for *in* and, respectively, company> possession of object> instrumentality> causation <effect for the preposition *with*. Although L-Subject constructions share the syntax of the NP1 V *with* NP2 intransitive causal constructions, their semantics differ. The subject position of an L-Subject construction is always occupied by an NP indicating a location as in *The orchard now blooms with apples*. We have argued that such sentences are licensed by the high-level metonymy A PROCESS (IN A LOCATION) FOR AN (INSTRUMENTALLY) CAUSED EVENT, whereby a place is conceived as being capable of blooming by making use of the real blooming entity as an instrument of action.

According to Levin (1993), the internal semantic parameters of a verb can serve as predictors of its distributional patterns. However, we have demonstrated that Levin's semantic criterion for *contribute* verbs may not be entirely reliable and the integration of these verbs into the dative construction can be motivated by several factors, among which we will highlight the following:

- (i) The absence of an animate recipient that can actively participate in the transferring event (e.g. *He donated his paintings to the museum*).

- (ii) The lack of complementariness between the roles of subject (agent) and first object (recipient) or, in Langacker's (1991) terms, the deprofiling of the possession relationship (e.g. *The young woman was doling out candies to all the children in her yard*). The constructional choice for *contribute* verbs may also be due to the fact that with some of these verbs the individuality of the recipients may be irrelevant. Note that the recipient can be left out in *distribute* verbs but this is not a clear possibility in the case of *give* predicates: *The girl distributed the leaflets [to the spectators]* (cf. *#The girl gave the leaflets*).
- (iii) The heaviness of the indirect object (e.g. *Spain is extending aid to Haitians who have been affected by the earthquake*) causes the recipient to move to the rightmost position in a sentence.
- (iv) The agent's reluctance to cause the reception of an entity makes a verb incompatible with the ditransitive construction, whose essential precondition involves the willingness of the agent to perform the transferring event (e.g. *George ponied up \$ 3000 to Bob* but **George ponied Bob up \$ 3000*).
- (v) The image-schemas that certain verbs evoke (e.g. motion out of a container) make them suitable for the dative construction as in *The government has already disbursed a large amount of money to the private sector*. The verb *disburse*, which comes from the old French word *desbourser* "remove from the purse" (< *bourse* "purse"), suggests motion from a source to a destination, which explains the choice of the dative construction (cf. **The government has already disbursed the private sector a large amount of money*).
- (vi) The motion to a different location is more conspicuous than the possession relationship between a recipient and an object (e.g. *My GP referred me to a specialist*).

In the line of Faber & Mairal's (1999) lexematics-oriented taxonomies, we have proposed our own onomasiological hierarchies for entity-specific change-of-state verbs and *contribute* verbs. The results of this part are in consonance with Faber & Mairal's (1999) contention that the conceptual structure of a verb functions as a predictor for the syntactic behavior of that verb. Verbs which inherit the semantic make-up of their *genus* also tend to behave syntactically in the same way as their superordinate predicate. Thus, the verb *dispense* can participate in the dative construction, just like its genus *distribute* (e.g. *She regularly dispensed medicines to "those not in acute distempers" [...] vs. The caughtagh [...] distributed gifts to the needy folk in hill villages*).

Our second goal was to describe how linguistic information related to these two verb classes can be implemented computationally in an NLP system, namely FunGramKB. Despite being neatly separated, the linguistic level (in our case the Lexicon and the Grammaticon) is connected to the conceptual level (in this case the Ontology) via the CLS Constructor. The relationships between ontological concepts are similar somewhat to the relations holding within onomasiological hierarchies of verbs. Basic concepts can be connected to their superordinate concepts by means of inheritance mechanisms. For instance, the inheritance relationship between +BURN_00 and +DAMAGE_00 is marked by the presence of the superordinate +DAMAGE_00 in the first predication of the MP of +BURN_00. Also, the MP of a subordinate concept comprises a distinctive feature (*differentiae*) which is not present in the MP of its superordinate concept. In chapter 5 we also describe the process that FunGramKB lexicographers carry out to assign verbs to a particular *Aktionsart* or to fill in the information related to the constructional or collocational patterns of verbs.

Several suggestions could be taken into consideration for the future development of this research project. First, our corpus of data could be further expanded to comprise

other change of possession classes, such as Levin's (1993) list of *fulfilling* verbs, *future having* verbs, *get* verbs, and even *obtain* verbs. Although this last group of verbs does not participate in the ditransitive construction or in the dative construction, it may be interesting to examine the principles that block out their fusion with the aforementioned constructions. Nevertheless, some verbs belonging to these groups have already been briefly dealt with in our dissertation (e.g. *leave*, *promise*, *offer* as *future having* verbs; *entrust* as a *fulfilling* verb), but we consider that a more refined analysis is needed.

A cross-linguistic study among different languages could be useful to throw light on the ways other cultures conceptualize the domain of change and change of possession. Contrasting English constructional configurations of possessive and change-of-state verbs with other (preferably unrelated) languages would confirm or disprove the hypotheses that we have formulated so far. Lastly, it is our aim to integrate the information related to the ditransitive and dative constructions into the Grammaticon of FunGramKB.

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APPENDIX I

Metaconcepts and the semantic interpretation of thematic roles (extracted from Perriñán & Mairal 2010: 32-33)

Metaconcept	Thematic roles	Definition
#COGNITION	[Agent]	Entity that makes another entity undergo a cognitive process
	Theme	Entity that undergoes a cognitive process
	Referent	Entity present in the consciousness of an entity that undergoes a cognitive process
#COMMUNICATION	Theme	Entity that transmits a message
	Referent	Message (i.e. set of propositions) that is transmitted
	Goal	Entity that receives a message
#CONSTITUTION	Theme	Entity that is made up of other entities
	Referent	Entity that is part of another entity
#CREATION	Theme	Entity that creates another entity
	Referent	Entity that is created by another entity
#EMOTION	Agent	Entity that makes another entity feel an emotion
	Theme	Entity that feels an emotion
	[Attribute]	Entity or quality that describes an attribute of an entity when feeling an emotion
#EXISTENCE	Theme	Entity that exists
#IDENTIFICATION	Theme	Entity that is identified by means of another entity
	[Referent]	Entity that serves to define

		the identity of another entity
	[Attribute]	Quality ascribed to an entity
#INTENTION	Theme	Entity that pursues actively a determinate aim
	Referent	Something which is actively pursued by an entity
#LOCATION	Theme	Entity that stays in a location
	Location	Location where an entity stays
#MATERIAL	Theme	Entity that, volitionally or not, performs an event
	[Referent]	Entity that is directly involved in the event caused by another entity
#MOTION	Agent	Entity that makes another entity move
	Theme	Entity that changes its place or position
	[Location]	Location in which an entity moves
	[Origin]	Location from which an entity moves
	[Goal]	Location to which an entity moves
#PERCEPTION	Theme	Entity that perceives another entity through any of the senses
	Referent	Entity that is perceived through any of the senses
#POSSESSION	Theme	Entity that owns another entity
	Referent	Entity that is owned
#TRANSFER	Agent	Entity that transfers another entity to a third entity
	Theme	Entity that is transferred
	Origin	Entity from which another entity is transferred

	Goal	Entity to which another entity is transferred
#TRANSFORMATION	Theme	Entity that transforms another entity
	Referent	Entity that is transformed by another entity

APPENDIX II

Semantic interpretation of satellites (extracted from Periñán & Mairal 2010: 34)

Role	Definition
Beneficiary	Entity different from those of the arguments that derives benefit from the occurrence of the event
Company	Entity that participates in a coordinated way with an entity of the arguments, usually Agent or Theme
Condition	Predication that describes under which condition the event should occur
Duration	Entity or quality that denotes the length of time from the beginning of the event to its end
Frequency	Quality that describes how often the event occurs
Instrument	Entity that is used to perform the event
Manner	Entity or quality that describes the way in which the event occurs
Means	Entity that, together with an Instrument, is used to perform the event
Position	Quality that describes the position of Theme with respect to Location, Goal or Origin
Purpose	Predication that describes the aim of the event
Quantity	Entity or quality that describes the amount related to the occurrence of the event
Reason	Predication that describes the cause of the event
Result	Predication or entity that describes the consequence of the occurrence of the event
Scene	Predication or entity that describes the situation in which the event occurs
Speed	Quality that describes how fast the event is performed
Time	Entity or quality that describes when the event is performed

APPENDIX III

Predication and participant operators (Periñán & Mairal 2010)

Feature		Value
Aspectuality		ing / pro / egr
Temporality		rpast / past/ npast / pres / nfut / fut / rfut
Modality	Epistemic	Cert / prob / pos
	Non-epistemic	Obl / adv / perm
Polarity		n

Predication operators

Aspectuality operators	Example
Ingressive (ing)	Mary started crying
Progressive (pro)	Mary was crying
Egressive (egr)	Mary stopped crying

Temporality operators	Example
Remote past (rpast)	Juan había cantado
Past (past)	Juan cantó
Near past (npast)	Juan ha cantado
Present (pres)	Juan está cantando
Near future (nfut)	Juan está a punto de cantar
Future (fut)	Juan cantará
Remote future (rfut)	

Modality operators	Certainty (cert)
	Probability (prob)
	Possibility (pos)
	Obligation (obl)
	Advice (adv)
Polarity operator	Permission (perm)
	Negation (n)

Feature	Value
Absolute quantification operator	1 (one)/ 2 (two)/ 3 (three)/ 4 (four)....
Relative quantification operator	m (much/many)/ s (some)/ p (few)
Indefinite quantification operator	i (more than one entity but the amount/number is not known)

Quantification operators

Feature	Value
Conjunction (&)	$a \& b$ (a and b)
Disjunction ()	$a b$ (a and/or b)
Exclusion (^)	$a \wedge b$ (either a or b, but not both)

Logical connectors

APPENDIX IV

Inventory of CLSs (adapted from Mairal, Periñán & Pérez 2011: 96)

Verbal class	Conceptual logical structure
State	$\langle C \rangle (x) \text{ or } (x,y)$
Activity	$\text{do}' (x, [\langle C \rangle (x) \text{ or } (x,y)])$
Achievement	INGR $\langle C \rangle (x) \text{ or } (x,y)$, or INGR $\text{do}' (x, [\langle C \rangle (x) \text{ or } (x,y)])$
Semelfactive	SEML $\langle C \rangle (x) \text{ or } (x,y)$ SEML $\text{do}' (x, [\langle C \rangle (x) \text{ or } (x,y)])$
Accomplishment	BECOME $\langle C \rangle (x) \text{ or } (x,y)$ or BECOME $\text{do}' (x, [\langle C \rangle (x) \text{ or } (x,y)])$
Active accomplishment	$\text{do}' (x, [\langle C \rangle (x, (y))])$ & BECOME $\langle C \rangle (z, x) \text{ or } (y)$
Causative accomplishment	$\alpha \text{ CAUSE } \beta$, where α and β are LSs of any type

Capítulo 1

Introducción

El objetivo principal de este trabajo de investigación es estudiar la conceptualización y la expresión de los dominios de cambio de estado y cambio de posesión en inglés sobre la base de los postulados de la Semántica Cognitiva y la Gramática de Construcciones (CxG), que reúne, por una parte, enfoques construccionistas centrados en las construcciones argumentales de alto nivel (por ej. Goldberg 1995, 2006) y, por otra parte, modelos basados en perspectivas minimalistas (por ej. Boas 2008ab; Iwata 2005; Nemoto 2005). El presente proyecto demuestra cómo estas dos grandes propuestas pueden aunarse de manera provechosa dentro de un único modelo teórico, a saber el *Modelo Léxico Construccional* (MLC; Mairal y Ruiz de Mendoza 2008, 2009; Ruiz de Mendoza y Mairal 2008, 2011).

Puesto que centraremos nuestra atención en construcciones argumentales, o en términos del MLC, construcciones del nivel 1, es importante entender cómo esta noción se ha concebido diacrónicamente dentro de los modelos construccionistas más representativos, desde la Gramática del Caso de Fillmore (1968), la Gramática de Construcciones de Goldberg hasta la Gramática de Construcciones Corpórea de Bergen y Chang (2005). La definición de construcción ha recibido distintas interpretaciones en función del enfoque que se adopte. Inicialmente, las construcciones son consideradas como asociaciones convencionales idiosincrásicas, no predecibles, de información sintáctica y semántica (cf. la Gramática del Caso de Fillmore). Los desarrollos ulteriores de este concepto son más completos en el sentido de que se pueden agrupar enunciados totalmente transparentes y composicionales bajo la rúbrica de las construcciones

siempre y cuando estén consolidados en la lengua (cf. Goldberg 2006; Langacker 2003ab; el MLC). Nos interesa entender la noción de construcción así como la forma en que se combinan las construcciones. El trabajo de Goldberg (1995) gira en torno a la fusión entre los papeles argumentales y los de los participantes, pero los principios de la *Congruencia Semántica* y de la *Correspondencia* son demasiado genéricos para dar cuenta de la subsunción léxico-construccional. El MLC explica los principios que licencian o bloquean la integración léxico-construccional pero la lista existente es incompleta y el número de las clases léxicas y de las construcciones analizadas es todavía bastante restringido. Este trabajo intenta contribuir a este desarrollo mediante un análisis exhaustivo del comportamiento construccional de los verbos de cambio específico y los de contribución.

Además, esta tesis propone jerarquías onomasiológicas para los verbos de cambio de estado específico y los verbos de contribución, basándose en las taxonomías lexemáticas de Levin (1993) y de Faber y Mairal (1999). Se han refinado las organizaciones de las clases léxicas sugeridas por Faber y Mairal (1999) utilizando una cantidad de datos más amplia y colecciones de textos computarizados que no estaban disponibles para estos autores en esa época. Se han factorizado los rasgos comunes a través de la observación directa del comportamiento semántico y sintáctico de los predicados. Hemos elaborado jerarquías de hipónimos y conceptos hiperonímicos con distinto grado de genericidad y especificidad. Los hipónimos heredan el significado central de sus predicados de orden superior pero al mismo tiempo se caracterizan por una serie de propiedades distintivas que los separan de otras unidades léxicas del mismo nivel. Los hallazgos de este trabajo coinciden con la hipótesis de Levin (1993) y de Faber y Mairal (1999), según la cual los predicados pertenecientes a la misma clase verbal muestran los mismos patrones construccionales. Por ejemplo, los verbos *bloom*,

blossom, *flower*, (traducidos como “florecer”), *sprout* y *germinate* (“brotar” y “germinar” respectivamente) comparten la estructura conceptual y el comportamiento sintáctico de su predicado de orden superior *develop* (“desarrollar”), es decir codifican un incremento de tamaño realizado sintácticamente por la construcción intransitiva de resultado.

Asimismo, cabe destacar que primero se han examinado las propuestas de la base de datos llamada FrameNet (Atkins, Fillmore y Johnson 2003; Fillmore, Johnson y Petrucci 2003) con respecto a las dos clases verbales ya mencionadas. Sin embargo, se han identificado los siguientes inconvenientes: (i) en la base de datos figura un número limitado de verbos de cambio de estado específico (sólo ocho de veintiún predicados); (ii) los usos causativos e incoativos están divididos en dos marcos semánticos diferentes; (iii) en algunos casos no se proporcionan ejemplos para los elementos de marco de un verbo determinado (por ej. el verbo *swell* “hinchar(se)” carece de ejemplos en los marcos de “expansión” y “cambio de posición en una escala”); (iv) por lo general, FrameNet incluye ejemplos literales y para los usos figurados no se facilitan motivaciones cognitivas de la forma; (v) en más de una ocasión los marcos tienden a ser incompletos debido al empleo de un corpus de tamaño pequeño (el Corpus Nacional Británico; BNC) que ofrece un número reducido de ejemplos para un verbo dado.

Otro objetivo más específico de esta tesis doctoral consiste en arrojar luz sobre la forma y el significado de los verbos de cambio específico y los verbos de contribución y en examinar la estructura conceptual de las principales construcciones en las que aparecen estos verbos, a saber la construcción intransitiva locativa, temporal y de frecuencia, la construcción intransitiva de causalidad, la intransitiva de resultado, la causativa, la construcción de resultado, la construcción de movimiento causado y de

camino, y las construcciones dativa y ditransitiva, que alternan a menudo. El marco teórico del MLC se sitúa a mitad de camino entre el enfoque goldbergiano (1995, 2006) y las versiones construccionistas propuestas por autores como Boas (2003, 2008ab), Iwata (2008) o Nemoto (2005). El supuesto inicial es que las construcciones de alto nivel interactúan de distintas formas con las configuraciones de bajo nivel. La primera situación supone una correspondencia perfecta entre la semántica verbal y la construccional, como se puede comprobar en el caso del verbo *break* ‘romper’, que se subsume en la construcción transitiva (cf. *He broke the window*) porque comparte con esta construcción los rasgos estructurales más relevantes, a saber ambos indican una acción efectual que causa un cambio de estado. En el MLC esta situación se denomina *Full Matching* ‘Adecuación Plena’, puesto que hace referencia a la identificación plena de las variables, subeventos y operadores entre las plantillas léxicas y construccionales. Una segunda posibilidad surge de la coerción, según la cual el significado de un predicado tiene que ajustarse al significado general de una construcción para poder fusionarse con ella. Un caso concreto lo proporciona el verbo *deceive* ‘engañar’ que sufre un proceso de adaptación para entrar en la construcción de movimiento causado (cf. [...] *I deceived her into thinking that she scared me [...]*; COCA 1989). En este ejemplo el verbo *deceive* ‘engañar’ cambia su estructura *Aktionsart* (de una actividad a un logro causativo) mediante la metáfora de alto nivel UN ACTO MENTAL MANIPULATIVO ES UNA ACCIÓN EFECTUAL. Un tercer caso, que no está contemplado por la Gramática de Construcciones de Goldberg, es aquel en el que la información semántica de un predicado restringe el tipo de los argumentos construccionales. La entidad que experimenta un cambio junto con la información codificada por el verbo *balloon* ‘hincharse’ constriñen la selección del complemento preposicional en la construcción intransitiva de resultado, que debe tener implicaciones

de significado más amplias que la entidad que cambia (por ej. [...] *an army mutiny rapidly ballooned into a major political rebellion by a group of soldiers [...]*). El cuarto caso es aquél en el que la configuración semántica de un predicado tiene más significado que las implicaciones de significado de una construcción, como en el ejemplo *The National Union of Mineworkers and the oil sheikhs denied him the title* (BNC B0H 952). El verbo *deny* ‘negar’ anula la interpretación de transferencia exitosa a la que contribuye en circunstancias normales la construcción ditransitiva. Dicho esto, vamos a demostrar que los constrictores internos y externos postulados por el MLC juegan un papel importante para licenciar o bloquear la subsunción léxico-construccional entre los verbos de cambio específico, los verbos de contribución y las construcciones ya mencionadas. Los constrictores externos se refieren a mecanismos cognitivos como la metáfora y la metonimia de alto nivel. Estos producen un cambio en la perspectiva de un predicado que le permite subsumirse fácilmente en una construcción dada. Por otra parte, los constrictores internos afectan a la estructura interna de un predicado (es decir, su composición enciclopédica y eventiva) y a cómo puede modificarse para licenciar la fusión del predicado con una cierta construcción. Por ejemplo, la construcción de resultado, cuando se formaliza mediante una construcción de movimiento causado, se basa en una cadena metafórica de alto nivel con distintas correspondencias de bajo nivel. La oración *They have metamorphosed into a cancer rotting the life out of our democracies* está motivada por un complejo metafórico compuesto por dos metáforas de alto nivel: (1) UNA ACCIÓN EFECTUAL ES MOVIMIENTO CAUSADO, y (2) DESHACERSE DE UNA PROPIEDAD ES DESHACERSE DE UN OBJETO EN MOVIMIENTO. Asimismo, los verbos de cambio específico pueden participar en una construcción intransitiva de causalidad que fusiona causalidad con espacialidad mediante la metáfora de bajo nivel ESTADOS SON

LUGARES (por ej. *But bells now rust from inactivity*, donde un estado de inactividad es el punto de partida en el camino de la degradación física). De modo parecido al tratamiento que realiza Lakoff (1987: 74) sobre el término *mother* ‘madre’, podemos entender el verbo *contribute* ‘contribuir’ como un concepto radial con un significado central concreto y múltiples extensiones metafóricas. La construcción media en el ejemplo *His ideas contributed to the development of the project* se basa en la metáfora LAS ENTIDADES ABSTRACTAS SON OBJETOS y la metonimia PROCESO POR ACCIÓN.

El MLC ha formulado seis grandes principios que licencian o bloquean los procesos de subsunción, concretamente *Full Matching* (“Adecuación Plena”), *Event Identification Condition* (“Condición de Identificación de Eventos”), *Lexical Blocking* (“Bloqueo Léxico”), *Lexical Class Constraint* (“Constricción de la Clase Léxica”), *Predicate-Argument Conditioning* (“Condicionamiento Predicativo-Argumental”), e *Internal Variable Conditioning* (“Condicionamiento de Variable Construccional”). El verbo *burn* ‘quemar’, en la construcción intransitiva *The fire burns*, obedece la restricción interna denominada *Full Matching* ‘Adecuación Plena’ puesto que el verbo de cambio interno de estado se fusiona perfectamente con una construcción que indica una acción llevada a cabo y experimentada por el sujeto. En la oración *He burnt them to death* el sintagma preposicional describe el evento de resultado final mientras que el verbo codifica un subevento causal anterior. El verbo de una construcción de resultado debe ser el subevento temporalmente más cercano al estado de resultado. Por eso, el evento de resultado no puede expresarse mediante una oración como **He kindled them to death* porque el verbo *kindle* ‘encender’ alude a la primera secuencia en la cadena de eventos (es decir significa ‘hacer que una entidad empiece a arder’). De este modo, la ‘Condición de Identificación de Eventos’ bloquea la subsunción del verbo *kindle*

‘encender’ en la construcción de resultado dado que hay un desajuste entre los subeventos codificados por el verbo y los de la construcción. El ‘Bloqueo Léxico’ impide la unificación del sintagma adjetival *burnt* ‘quemado’ con la construcción de resultado en la cual se emplea el verbo *burn* ‘quemar’ (cf. **The man burnt the house burnt*). Además, la ‘Constricción de la Clase Léxica’ no permite la construcción ditransitiva **George ponied up Bob \$3000*, puesto que el verbo *pony up* ‘apolingar/mocharse’ pertenece a una clase verbal que destaca la renuencia de un agente hacia la transferencia de una entidad (por ej. *shell out* ‘soltar dinero’, *fork out* ‘aflojar la pasta’, *cough up* ‘soltar dinero’). La falta de voluntad de la transferencia por parte del agente entra en conflicto con uno de los requisitos fundamentales de la construcción, concretamente la intención del agente por realizar el evento de dar. El elemento Y en la construcción de resultado *The animal molted out its skin/hair/shell* aparece restringido por la elección del verbo *molt* ‘pelechar’ y el sintagma adverbial *out* ‘afuera’. El ‘Condicionamiento Predicativo-Argumental’ estipula que el elemento Y puede ser sólo una envoltura corporal pero nunca una parte del cuerpo (cf. **The animal molted out its head/tail/paws*). El ‘Condicionamiento de Variable Construccional’ es operativo cuando la información semántica de un predicado condiciona la elección del elemento Z en una construcción intransitiva de resultado. A modo de ejemplo, considérese la oración *The work, which was originally meant to consist only of a few sheets, swelled into ten volumes*. El significado del verbo *swell* (‘hinchar’) y la entidad que experimenta la hinchazón constriñen el carácter de la entidad resultante Z que tiene un tamaño más voluminoso o un valor mayor que el elemento Y. El MLC ha añadido recientemente una nueva constricción interna denominada *Focal Prominence Compatibility* ‘La Compatibilidad de la Prominencia Focal’ que explica porque el verbo *contribute* ‘contribuir’ no puede aparecer en la construcción ditransitiva. Los requisitos de

prominencia focal de este verbo (es decir la existencia de múltiples colaboradores con múltiples colaboraciones) entran en conflicto con los de la construcción ditransitiva que indica un único acto de donación. Por último, el MLC explora la validez de sus hallazgos a través de la colaboración con una base de conocimiento léxico-conceptual para el desarrollo de sistemas de Procesamiento del Lenguaje Natural (PLN), denominada FunGramKB, desarrollada por Perrián y Arcas (2004, 2005, 2007ab, entre otros). La selección de esta base de conocimiento está motivada por varios factores. En primer lugar, el formalismo de FunGramKB se fundamenta en modelos lingüísticos sólidos como la Gramática Funcional de Dik (1997) o la Gramática del Papel y de la Referencia (GPR; Van Valin y La Polla 1997; Van Valin 2005). No obstante, FunGramKB supera estos dos enfoques ya que: (i) apuesta por una visión conceptualista que trata con conceptos universales y no unidades léxicas; (ii) reemplaza las estructuras lógicas de la GPR con las ‘Estructuras Lógico Conceptuales’ (EELLCC) que incorporan información tanto sintáctica como semánticamente relevante; y (iii) enriquece las EELLCC con conocimiento cultural y enciclopédico mediante mecanismos de herencia. En segundo lugar, la descripción de significado en FunGramKB sobrepasa la perspectiva relacional adoptada por bases de datos como SIMPLE o EuroWordNet, puesto que su orientación conceptualista es más económica (por ej. la minimización de la redundancia a través de la aglutinación de varias unidades léxicas a un mismo concepto, el agrupamiento de palabras conectadas al mismo escenario cognitivo) y se caracteriza por un mayor grado de expresividad (por ej. la posibilidad de codificar aspectos de cuantificación, temporalidad, modalidad; la no-monotonidad o la retractación de predicaciones).

En el capítulo 2 proporcionamos una descripción exhaustiva de la arquitectura de FunGramKB que distingue claramente entre el nivel lingüístico y el conceptual:

(i) El nivel lingüístico está compuesto por un módulo léxico y gramatical. El componente léxico se puede dividir todavía en: (a) el Morfición y (b) el Lexicón. Lo que nos interesa en esta tesis es la información almacenada en el Lexicón (por ej. el número de las variables, las *Aktionsart*, la asignación de los macropapeles y las colocaciones) y su relevancia a nivel sintáctico. El módulo gramatical, también llamado Gramaticón, comporta cuatro Constructicones: (a) el L1-Constructicón o nivel de la estructura argumental; (b) el L2-Constructicón o nivel de las implicaturas; (c) el L3-Constructicón o nivel ilocutivo, y (d) el L4-Constructicón o nivel discursivo.

(ii) El nivel conceptual es una representación fiel del modelo de la memoria a largo plazo de Tulving (1985) en el sentido de que está compuesto por tres niveles de conocimiento compartidos por todas las lenguas: (i) el Cognición que almacena el conocimiento procedimental, (ii) el Onomasticón que almacena el conocimiento enciclopédico y (iii) la Ontología que se presenta como un catálogo jerárquico de unidades conceptuales.

El capítulo 5 ofrece una aplicación de cómo el conocimiento semántico puede ser tratado computacionalmente estableciendo una conexión entre tres módulos de FunGramKB, es decir la Ontología, el Lexicón y el Gramaticón. La Ontología se compone de tres tipos de unidades conceptuales: los metaconceptos, marcados por el símbolo #, los conceptos básicos, precedidos por +, y los conceptos terminales, precedidos por el símbolo \$. En consonancia con la organización jerárquica de la Ontología, hemos demostrado que el concepto básico +BURN_00 depende conceptualmente de los siguientes conceptos de orden superior y metaconceptos: +BURN_00 << +DAMAGE_00 << +CHANGE_00 << #TRANSFORMATION << #MATERIAL << #EVENT. Para preservar la minimización del compromiso de

superfluidad, hemos aglutinado verbos como *combust*, *conflagrar*, *ignite*, *inflame*, *kindle*, *arder*, y *encender* como unidades léxicas vinculadas al concepto básico +BURN_00.

Este trabajo se divide en dos partes distintas. La primera se centra en: (i) las principales suposiciones teóricas desarrolladas dentro del contexto de la Gramática de Construcciones, que proporcionan los fundamentos teóricos para este estudio, y (ii) las decisiones metodológicas relevantes. La segunda parte se basa exclusivamente en el análisis y la explicación de ejemplos extraídos de corpus y una breve implementación computacional de algunos de los supuestos básicos del MLC. A continuación, detallamos los contenidos de cada sección:

El capítulo 1 (*Introducción*) enfatiza la necesidad de este trabajo de investigación y las razones por las cuales se ha llevado a cabo. Así, la motivación que subyace a esta tesis se basa en: (i) la necesidad de un análisis sólido del comportamiento construccional, así como de los principios que regulan sus procesos de subsunción, y (ii) la importancia de establecer una conexión entre los campos de la lingüística y el computacional para validar los hallazgos ya existentes.

En el capítulo 2 (*Una perspectiva general de la Gramática de Construcciones*) se presentan los principales postulados de la Lingüística Cognitiva y más específicamente, de la Gramática de Construcciones. Se revisan críticamente ocho de los exponentes más representativos de la Gramática de Construcciones y se contrastan con el modelo teórico que se adopta en esta tesis doctoral. Este capítulo también contiene información sobre los orígenes y la arquitectura general del MLC. Las nociones de plantilla léxica y construccional, por un lado, y de subsunción léxico-construccional, por otro lado, son centrales para nuestro análisis de los verbos de cambio de estado específico y los verbos

de contribución. Además, la última parte de este capítulo se dedica a la exploración del proyecto de inteligencia artificial llamado FunGramKB.

El capítulo 3 (*Metodología*) describe el procedimiento que se ha seguido a lo largo de este trabajo. La primera parte se centra en la descripción del corpus y de los pasos que se han dado para la compilación de datos. La segunda parte revisa las consideraciones metodológicas y da cuenta de las decisiones relacionadas con la metodología.

El capítulo 4 (*Los verbos de cambio de estado específico y los verbos de contribución*) se basa en el análisis de dos clases verbales, a saber, los verbos de cambio de estado específico y los verbos de contribución. Esta sección trata de cómo estos predicados se subsumen en una gran variedad de construcciones, desde la intransitiva locativa, temporal y de frecuencia, la intransitiva de resultado, y la construcción de resultado hasta la ditransitiva y la dativa. Las distintas subsecciones destacan y utilizan los constrictores internos y externos propuestos por el MLC, así como otras herramientas explicativas.

El capítulo 5 (*El conocimiento lingüístico y FunGramKB*) ofrece un breve resumen de la modelación ontológica de conceptos, junto con una explicación detallada del trabajo lexicográfico llevado a cabo para rellenar la información en el Lexicón. Asimismo, este capítulo demuestra cómo se relacionan entre sí tres diferentes módulos de FunGramKB, concretamente el Lexicón, la Ontología y el Gramaticón, mediante el Constructor CLS.

El capítulo 6 (*Conclusiones*) contiene todos los hallazgos de nuestro trabajo de investigación. Se mencionan todos los objetivos que se han cumplido y se incluyen varias propuestas para futuras investigaciones. La parte final de la tesis se compone de la sección de los apéndices y de las referencias bibliográficas: el *Apéndice I* presenta

una lista exhaustiva de los metaconceptos, sus definiciones y sus correspondientes papeles temáticos; el *Apéndice II* revela la interpretación semántica de las predicaciones satélite; el *Apéndice III* contiene los operadores de las predicaciones y de los participantes mientras que el *Apéndice IV* expone un inventario completo de las EELLCC. La sección titulada *Referencias bibliográficas* ofrece una lista del material bibliográfico que se ha empleado para el presente estudio.

Capítulo 2

Una perspectiva global de las Gramáticas de Construcciones

La posición adoptada por este proyecto de investigación se inscribe dentro de la Gramática de Construcciones, que abarca una amplia gama de modelos conectados entre sí. Este capítulo repasa críticamente y compara el MLC con ocho de los más representativos exponentes de la Gramática de Construcciones, a saber (i) la *Gramática del Caso* de Fillmore (cfr. Fillmore 1968; Fillmore, Kay y O'Connor 1988 [2003]; Fillmore y Kay 1995); (ii) la versión original de Lakoff (1987); (iii) la *Gramática Cognitiva* de Langacker (1995, 1996, 2003); (iv) la variante de Goldberg (1995, 1996, 1997, 2006, 2009); (v) la *Gramática de Construcciones Radical* de Croft (2001, 2003, 2005); (vi) el modelo léxico-sintáctico basado en el uso de Boas (2000, 2003, 2010, 2011ab) y (vii) otros modelos de índole computacional como la *Gramática de Construcciones Corpórea* (vid. Bergen y Chang 2005) o la *Gramática Fluida de Construcciones* (véase De Beule y Steels 2005). A pesar de sus discrepancias teóricas y metodológicas, los enfoques construccionistas coinciden en los siguientes aspectos clave (cf. Fried y Östman 2004: 11-25; Goldberg 2003; González García 2003: 143; también González García y Butler 2006):

- (i) En contraposición a la visión chomskiana de las construcciones concebidas como meros artefactos taxónomicos, la Gramática de Construcciones (GC) considera que las construcciones son unidades básicas de descripción y explicación, independientes de las unidades léxicas que las componen. Por ejemplo, en la construcción *What's X Doing Y?* (Kay y Fillmore 1999) el significado de queja no se puede deducir directamente de sus componentes léxicos. Las construcciones son asociaciones de forma y significado, donde la

forma contiene información sobre las propiedades morfosintácticas y la forma prosódica y fonética, mientras que la función está relacionada con las características semánticas, pragmáticas y discursivas (cf. Fried y Östman 2004: 19-23; Östman y Fried 2005: 1).

(ii) Las construcciones se conciben como entidades teóricas independientes y de carácter psicológico. Se pueden combinar libremente para formar expresiones lingüísticas siempre y cuando no entran en conflicto. Por ejemplo, la inaceptabilidad de la oración **The man sent Madrid a box* puede ser motivada por un conflicto entre la construcción ditransitiva, que exige un receptor animado, y el nombre propio *Madrid*, que expresa un lugar inanimado que no puede participar activamente en la transferencia. Además, una oración sencilla generalmente combina muchas construcciones distintas. A modo de ejemplo considere la oración *The squirrel cracked his nut*, tomada de Goldberg y Suttle (2010). Este enunciado contiene un sintagma verbal (VP), un sintagma nominal (NP), unas construcciones transitivas y sujeto-predicado así como construcciones individuales correspondientes a cada una de las palabras empleadas en la oración.

(iii) La Gramática de Construcciones adopta una perspectiva no-derivacional y no-modular que supone la existencia de un continuo entre la gramática y el léxico. Todas las construcciones son igualmente importantes para el estudio del lenguaje. Como han observado Fried y Östman (2004: 16), “la única contribución de la Gramática de Construcciones ha sido proporcionar herramientas analíticas que no exigen decisiones *a priori* sobre lo que debe considerarse básico o central en la lengua”.

(iv) La Gramática de Construcciones se adhiere al Principio de la No Sinonimia de las Formas Gramaticales (Bolinger 1968: 27), según el cual una diferencia en

la forma implica una diferencia en el significado y en la función. A diferencia de la Gramática Generativa, que concibe la construcción ditransitiva como una derivación de la dativa, en la Gramática de Construcciones la relación entre las dos construcciones está vista en términos de paráfrasis y solapamiento léxico parcial.

(v) La gramática está vista como una extensa red de construcciones léxicas y sintácticas interrelacionadas con distintos grados de especificidad y de complejidad sintáctica; las generalizaciones realizadas a partir de las construcciones son una cuestión de relaciones de herencia. Las configuraciones de bajo nivel heredan propiedades de las construcciones de alto nivel que son más abstractas. Con respecto a esto, Goldberg (2003: 223) demuestra que la construcción *What's X doing Y?* hereda propiedades de otras construcciones de alto nivel como las construcciones Verb Phrase 'sintagma verbal', Subject-Auxiliary Inversion 'inversión sujeto-auxiliar', y Subject-Predicate 'sujeto-predicado'.

El MLC reivindica la existencia de dos procesos de subsunción: léxico-construccional y entre construcciones. El segundo tipo se refiere al proceso de integración de construcciones pertenecientes al mismo nivel descriptivo y que da como resultado los amalgamas construccionales (cf. Ruiz de Mendoza & González 2011). Las ventajas del MLC pueden resumirse de la siguiente manera (véase también Butler 2009: 26):

(i) El MLC coincide con Boas en la importancia de la semántica verbal para el significado construccional, pero al mismo tiempo reconoce el papel de la

metáfora y metonimia como factores restrictores externos para la subsunción léxico-construccional.

- (ii) Las plantillas léxicas propuestas por el MLC son más refinadas que los marcos semánticos de Boas, ya que sólo las plantillas léxicas conectan la semántica con la sintaxis mediante las estructuras lógicas de la GPR. Asimismo, la incorporación de las estructuras lógicas en la descripción léxica permite proyectar el significado léxico en la realización sintáctica, una posibilidad ausente en el modelo de Boas.
- (iii) El MLC está en la actualidad parcialmente tratado computacionalmente. Los principios de este modelo son compatibles con el proyecto de Inteligencia Artificial FunGramKB.

FunGramKB se caracteriza por ser una base de conocimiento multipropósito con un destacado basamento conceptual. Es un recurso multifuncional en el sentido de que se puede emplear para realizar varias tareas de PLN como la recuperación y extracción de información, la traducción automática, los sistemas de diálogo persona-máquina, etc. Tiene además un carácter multilingüe pues nos permite trabajar con diversas lenguas naturales como el inglés, español, alemán, francés e italiano.

FunGramKB distingue dos grandes niveles de información: el lingüístico y el conceptual. El primero recoge todas aquellas propiedades idiosincrásicas de una determinada lengua mientras que el segundo se ocupa de las características universales de todas las lenguas naturales que la base soporta. El nivel lingüístico está formado por un módulo léxico y uno gramatical. El nivel léxico abarca un Lexicón y un Morfición para cada una de las lenguas con las que se trabaja. El Lexicón incluye información morfosintáctica, pragmática y colocacional sobre una determinada pieza léxica, mientras que el Morfición trata los casos de morfología flexiva. La estructura del nivel

gramatical, denominado Gramaticón, se inspira en la organización por niveles de construcción de significado del MLC y distingue cuatro módulos o Constructicones, a saber el L1-Constructicón o el estrato argumental, el L2-Constructicón o el nivel pragmático, el L3-Constructicón o el nivel ilocutivo y el L4-Constructicón o el nivel discursivo.

El componente conceptual incorpora tres módulos cognitivos, es decir (i) una Ontología, que se concibe como un catálogo jerárquico de conceptos; (ii) un Onomasticón, que comprende el conocimiento episódico sobre las entidades y eventos particulares, p. e. los Beatles, el Taj Majal, el 11 de Septiembre, etc.; y (iii) un Cognicón, que almacena el conocimiento procedimental en esquemas y guiones, p. e. ‘freír un huevo’ o ‘comprar un producto’.

La Ontología está poblada por tres tipos de unidades conceptuales: (i) los metaconceptos (cfr. #ABSTRACT, #MOTION, #COMMUNICATION, etc.); (ii) los conceptos básicos (+FAR_00, +HAND_00, +HUMAN_00, etc.); y (iii) los conceptos terminales (\$EXCHANGE_00, \$SWEAR_00, \$HUM_00, entre otros).

Los conceptos básicos y terminales poseen una serie de propiedades semánticas, es decir los ‘Marcos Temáticos’ o MMTT y los ‘Postulados de Significado’ o PPSS. Periñán & Mairal (2009) definen el MT como un constructo interlingüístico que especifica el número y el tipo de participantes implicados en la situación cognitiva descrita por un concepto, mientras que el PS es un conjunto de una o más predicaciones lógicamente conectadas entre sí. A modo de ilustración, considérese el MT del concepto básico +PAY_00, al cual se vinculan tres unidades léxicas, a saber *pay* [inglés], *pagar* [español], y *payer* [francés]:

(x1: +HUMAN_00)Agent (x2: +MONEY_00)Theme (x3)Origin (x4:
+HUMAN_00)Goal

De esta forma, el concepto básico +PAY_00 tiene cuatro participantes: un Agente que hace que una entidad se mueva (x1), un Tema que cambia de lugar, un Origen que es el lugar de inicio del Tema (x3), y la Meta que es el lugar hacia donde el Tema se mueve (x4). Los tipos de participantes pueden recoger información aún más específica mediante preferencias de selección, p. e. +HUMAN_00 o +MONEY_00 (el Agente y la Meta son humanos mientras que el Tema es siempre dinero). En cuanto a los PPSS, consideremos la representación de +PAY_00:

+(e1: +GIVE_00 (x1)Agent (x2)Theme (x3)Origin (x4)Goal (f1: (e2: +SELL_00
(x4)Agent (x5)Theme (x4)Origin (x1)Goal))Reason)

Leemos este PS como sigue: un Agente x1 da una entidad x2 que se encuentra en una localización x3 a una Meta x4. Todo este evento está sujeto a una razón: la Meta vendió una entidad x5 al que ahora es el Agente x1.

Por último, la conexión entre el Lexicón, la Ontología y el Gramaticón se realiza mediante el Constructor de la Estructura Lógica Conceptual (ELC) que recupera la información sobre una unidad léxica del Lexicón y de la Ontología y genera una ELC básica. En un segundo estadio, el Constructor ELC combina la ELC básica con la información almacenada en el Constructicón correspondiente y crea una ELC derivada.

Capítulo 3

Metodología

Este capítulo describe el procedimiento que se ha llevado a cabo a lo largo de la investigación. La primera parte se ocupa de describir el corpus y los pasos seguidos en la compilación de los datos. La segunda parte repasa las consideraciones metodológicas y da cuenta de las decisiones relacionadas con la metodología.

El MLC combina tanto la lingüística de corpus como la lingüística teórica, puesto que hace uso de datos extraídos del corpus así como de un marco teórico sólido dentro del cual los datos compilados pueden ser descritos, analizados y explicados. Gilquin (2010: 16-17) enumera las ventajas ofrecidas por un modelo que une la lingüística cognitiva y la de corpus: (i) la lingüística cognitiva aporta más sofisticación teórica, desarrolla el poder explicativo y la verosimilitud psicológica de la lingüística de corpus mediante la incorporación de aspectos de suma importancia para la interpretación de datos (*vid.* la motivación semántica y pragmática de las observaciones lingüísticas); (ii) usando la lingüística de corpus como metodología, la lingüística cognitiva confirma su estatus como modelo basado en el uso y afianza su adecuación descriptiva y su verosimilitud lingüística. El presente trabajo complementa los supuestos cognitivos con información de varios corpus pero no se asemeja a los análisis cuantitativos y estadísticos propuestos por Stefanowitsch y Gries (2003), Gries y Stefanowitsch (2006), Gries y Wulff (2009), Peirsman, Geeraerts y Speelman (2010), Turney y Pantel (2010), por nombrar solo algunos.

La noción de corpus ha recibido una ingente cantidad de definiciones pero la más completa es la demarcación proporcionada por Lüdeling y Kytö (2008: v), que

comprende los siguientes criterios: (i) una forma legible por la máquina en contraposición al texto impreso; (ii) el muestreo y la representatividad (una selección de una variedad entera de lengua es más indicada que el examen de textos pertenecientes a un autor o a un único registro/género); (iii) un tamaño finito (p.e. el BNC contiene un número limitado de palabras) a diferencia de un tamaño constante (p.e. el COBUILD de John Sinclair es un corpus monitor que incrementa constantemente su tamaño); y (iv) la referencia estándar, es decir un corpus usado extensivamente se considera como punto de referencia para la comparación de estudios sucesivos.

En una primera fase, compilamos ejemplos extraídos únicamente de fuentes como el BNC o el COCA (el Corpus de inglés americano contemporáneo, en sus siglas inglesas) pero estas bases de datos suministraron un número limitado de ejemplos. Ocasionalmente hemos utilizado la Web a través de búsquedas en los “libros de Google”, en consonancia con los enfoques metodológicos de Renouf (2003), y Kilgarriff y Grefenstette (2003), que reivindican el uso de Google como un recurso perfectamente válido para la recuperación de información lingüística y para otros tipos de investigación relacionados con la lengua.

Huelga decir que nuestra metodología se basa en un enfoque hipotético-deductivo con el fin de proporcionar una visión panorámica del tema objeto de estudio. Este método se divide en dos etapas: (i) la formulación de una hipótesis teórica basada en la introspección; y (ii) la validación o el rechazo de los supuestos teóricos mediante un estudio minucioso de los datos relevantes. En el caso de los verbos de cambio específico, la hipótesis de partida se centra en la vinculación de la estructura conceptual de estos verbos a uno o dos esquemas de cambio que Ruiz de Mendoza y Luzondo (2011) han clasificado como $A > A'$ o $A > B$. Así, los verbos que denotan un cambio de

estado positivo (p.e. *blossom* ‘florecer’, *swell* ‘hinchar’, etc.) están correlacionados con el esquema A>A’ (p.e. *The flowers blossomed red*). Alternativamente, los verbos que describen un cambio de estado negativo tienden a evocar el esquema A>B (ej. *The house burned to ashes*). Hemos utilizado la inducción cuando un examen detallado de los datos nos indujo a generalizar sobre la estructura semántica de determinados verbos. Por ejemplo, la construcción intransitiva de resultado con el verbo *tarnish* ‘deslustrarse’ demuestra que el verbo en cuestión no se combina con el esquema A>B aún cuando se refiere a un cambio de estado negativo (p.e. *All its golden sequins tarnished into green*, que refleja la adquisición de un distinto color y no un cambio trascendente). De aquí se puede inferir que no todos los verbos que describen un cambio de estado negativo van a seleccionar el esquema A>B, sino solo esos verbos que codifican un cambio destructivo que afecta la integridad física de una entidad. Este trabajo de investigación también favorece una metodología cualitativa en detrimento de una postura cuantitativa, ya que la primera se basa en la explicación y la descripción de los fenómenos lingüísticos, mientras que la segunda requiere un procesamiento estadístico de datos para la elaboración de generalizaciones.

Para acabar, nuestro proyecto de investigación ha seguido dos etapas principales: (i) una etapa de exploración y descripción en la cual se seleccionan las fuentes disponibles para la compilación de datos y se identifican los fenómenos lingüísticos relevantes para nuestros propósitos analíticos y (ii) una etapa de validación de las hipótesis en la cual se proveen explicaciones adecuadas para el comportamiento construccional de los verbos.

Capítulo 4

Los verbos de cambio específico y los verbos de contribución

Este capítulo analiza los factores que licencian o bloquean la subsunción léxico-construccional de dos clases verbales, concretamente los verbos de cambio de estado específico y los verbos de contribución. La lista de verbos de cambio de estado específico propuesta por Levin (1993: 246) incluye veintiún verbos que hemos clasificado en tres grupos principales sobre la base de su similitud conceptual y el esquema de cambio seleccionado:

- (i) Verbos que se combinan con el esquema A>A' y que describen un incremento de tamaño (p.e. *bloom*, *blossom*, *flower*, “florecer”, *germinate*, “germinar”, *sprout*, “brotar”, *swell*, “hinchar”, *blister*, “hacerse/formarse ampollas”);
- (ii) Verbos que se fusionan con el esquema A>B y que describen un cambio negativo, destructivo (p.e. *burn*, “quemar”, *corrode*, “corroer(se)”, *decay*, “decaer”, *deteriorate*, “deteriorarse”, *erode*, “erosionar”, *molder*, “desmoronarse”, *molt*, “pelechar”, *rot*, “pudrir”, *rust*, “oxidarse”, *stagnate*, “estancarse”, *tarnish*, “deslustrarse”, *wilt*, *wither*, “marchitarse”);
- (iii) El verbo *ferment* “fermentar” sigue el esquema A>A' pero es distinto a los dos grupos anteriores en el sentido de que no codifica un incremento de tamaño y el cambio no es necesariamente negativo.

Asimismo, la distribución sintáctica de los verbos de cambio de estado específico es más amplia de lo que atestiguan previos estudios (Levin 1993; Wright 2002). En otras palabras, los patrones construccionales de estos verbos no se restringen a la alternancia incoativa/causativa, sino que disponen de una gran variedad sintáctica (a saber la

construcción intransitiva de lugar/de tiempo/de frecuencia, la construcción intransitiva de resultado, intransitiva de causa, intransitiva de movimiento, causativa, de resultado, de movimiento causado y de camino).

El propósito de este capítulo consiste en demostrar la utilidad de los principios analíticos formulados por el MLC para motivar los procesos de subsunción léxico-construccional. Por ejemplo, las construcciones de resultado que toman la forma de una construcción de movimiento causado están fundamentadas en una cadena metafórica con varias correlaciones de bajo nivel. Considérese la frase *They [the Prime Minister and Presidents along with their most senior Cabinet members and officials] have metamorphosed into a cancer rotting the life out of our democracies*. Los gobernantes del país se conciben como un cáncer que deja el cuerpo sin vida, mientras que el cuerpo humano se corresponde al país afectado por los gobernantes. La vida (una entidad abstracta) se percibe como una sustancia concreta ubicada en un contenedor (cfr. la metáfora de bajo nivel LAS ENTIDADES ABSTRACTAS SON CONTENEDORES). Otra metáfora de bajo nivel es LAS CAUSAS SON FUERZAS mediante la cual las acciones de los gobernantes se consideran como una fuerza que actúa sobre otra entidad. Por último, la subsunción del verbo *puir* en la construcción de resultado está licenciada por un complejo metafórico que comprende dos metáforas: (1) UNA ACCIÓN EFECTUAL ES MOVIMIENTO CAUSADO y (2) DESHACERSE DE UNA PROPIEDAD ES DESHACERSE DE UN OBJETO EN MOVIMIENTO. La vida como sustancia se corresponde a una característica de los países democráticos: la vida de una democracia es lo que es esencial para su existencia (p.e. la libertad de elección). Los verbos de cambio de estado específico participan en la construcción intransitiva de causa que fusiona la causalidad con la espacialidad mediante la metáfora LOS ESTADOS SON LUGARES (ej. *But bells now rust from inactivity*, en la cual un estado

de inactividad es el punto de inicio en el camino de la degradación física). En la construcción intransitiva de causalidad, los dominios conceptuales de la causa y del espacio se fusionan mediante el uso de la metáfora LOS ESTADOS SON LUGARES. Consideremos el ejemplo *Frescoes generally became dark or decayed from moisture [...]*. La preposición *from* ‘desde’ activa el esquema del CAMINO y más específicamente el punto de partida que se relaciona con el estado de humedad. El verbo *decay* ‘descomponerse’ destaca el estado final de los frescos indicando que la entidad afectada ha alcanzado el punto final de una trayectoria (cf. UN CAMBIO DE ESTADO ES UN CAMBIO DE LUGAR). En una visión simplista del mundo la fuente de movimiento se mezcla con su causa porque en el punto de partida se reúnen las condiciones que lo desencadenan. Por tanto, en la mente humana el estado inicial se fusiona con el punto de partida de una trayectoria y con su causa. De la misma forma, el estado final se correlaciona con el destino del movimiento y con el resultado de un cambio (cf. *The rotten brick decayed to dust*).

Este capítulo también presenta los restrictores internos a los procesos de subsunción. La integración de los verbos del segundo grupo en la construcción intransitiva de resultado está regulada por el Condicionamiento de Variable Construccional, según el cual la estructura semántica interna de un verbo determina el carácter de los argumentos construccionales. Todos los verbos del segundo grupo describen un cambio de estado negativo que afecta la integridad del paciente. Por eso, el elemento Z tiende a ser axiológicamente negativo (cf. *Of course our ethnic, national, religious traditions are a source of rootedness, identity, and community. But not when it ceases to be a matter of honest pride and corrodes into divisiveness and bitterness; Sketch engine doc#827042; These discussions, decaying into dissension, strangely arouse Tilly [...]; Sketch engine doc#62924; The Taliban saw as their mission the*

purification of the Islamic holy war which had decayed into anarchy in Afghanistan; Sketch engine doc#639513; [...] *it does not take long for the marvel to deteriorate to disenchantment;* Sketch engine doc#919860; *Over time, once fit emotional and physical states may deteriorate to illness and disease;* Sketch engine doc#813417). El verbo *deteriorate* ‘deteriorarse’, que indica un estado de regresión, se puede contrastar con *blossom* ‘florecer’, que describe el desarrollo de una entidad. Comparemos la oración *Their relationship blossomed into marriage* con *Their relationship deteriorated into divorce*. En ambos enunciados una relación se conceptualiza como la entrada en un estado/contenedor (por ej. el estar soltero o casado) pero la manera de movimiento es distinta, a saber, en la primera oración el movimiento se ve de forma positiva, mientras que en la segunda tiene connotaciones negativas. La oración **Their relationship deteriorated into marriage* está bloqueada por el Condicionamiento de la Variable Construccional según el cual el elemento Z tiene que concordar con la estructura semántica del verbo.

Capítulo 5

Conocimiento lingüístico y FunGramKB

El presente capítulo examina cómo la información lingüística se modela computacionalmente dentro de FunGramKB (www.fungramkb.com) y cómo tres módulos distintos, a saber el Lexicón, la Ontología y el Gramaticón, se relacionan entre sí. Los verbos de cambio de estado específico son instanciaciones de la dimensión cognitiva #TRANSFORMATION (“transformación”), que está formada por dos participantes obligatorios: (i) un Tema, definido como una entidad que transforma otra entidad, y (ii) un Referente, que es una entidad transformada por otra entidad. Los verbos de contribución están representados bajo el metaconcepto #MOVEMENT (“movimiento”), que incluye cuatro papeles temáticos: (i) un Agente, es decir, una entidad que hace desplazarse a otra entidad; (ii) un Tema, que es una entidad que cambia de lugar o posición; (iii) un Origen, que es el lugar de partida de una entidad en movimiento y (iv) una Meta, que es un lugar hacia donde una entidad se mueve.

Seguidamente, dedicamos una sección a describir las etapas en la creación de nuevos conceptos terminales para los conceptos básicos ya existentes en la Ontología. Tómese por ejemplo el concepto básico +BURN_00:

- (i) Se agrupan todos los posibles sinónimos para este concepto tanto en inglés como en español, consultando diccionarios como el *Longman Dictionary of Contemporary English*, *English Collins Dictionary and Thesaurus* para el inglés, y el DRAE: *Diccionario de la Lengua Española* (Real Academia), *CLAVE* para el español, entre muchos otros. La lista final de verbos relacionados con el evento de

quemar contiene predicados como *cauterize, carbonize, char, combust, conflagrate, cremate, ignite, incinerate, inflame, kindle, light, scorch, singe, torch*, para el inglés y *arder, abrasar, cauterizar, carbonizar, chamuscar, conflagrar, encender, incinerar, inflamar, prender*, para el español.

(ii) Se decide la creación de un nuevo concepto terminal, a saber \$SINGE_00 que, además de compartir la información semántica del concepto padre +BURN_00, incorpora una serie de características que lo diferencian de su superordinado: la especificidad de la entidad que se quema (una superficie), la manera en la que un evento ocurre (levemente) y el resultado del evento (la superficie se ennegrece). Toda esta información queda reflejada en el MT y el PS de este concepto terminal. La etapa final concierne la aglutinación de unidades léxicas relacionadas con el concepto terminal \$SINGE_00 (p.e. los verbos *char, scorch, singe*, para el inglés y *chamuscar* para el español).

Tras ejemplificar el trabajo de los ingenieros de conocimiento en la Ontología, describimos el componente léxico de FunGramKB, centrándonos en las propiedades de la gramática nuclear del MLC, a saber la tipología de los *Aktionsarten* (o aspecto léxico), el número de variables, la asignación de los macropapeles y la selección de las construcciones sintácticas. Así, el verbo *burn* “quemar” está clasificado como una realización que se caracteriza por los siguientes rasgos: [-estático], [-dinámico], [+télico] y [-puntual]. Este tipo básico de *Aktionsart* presenta una contrapartida causativa (p.e. *The fire burnt the house*). Los lexicógrafos de FunGramKB tienen que determinar el tipo de *Aktionsart* de cada predicado y por ello, tienen que aplicar las siete pruebas propuestas por Van Valin & La Polla (1997: 94): (1) la compatibilidad con el aspecto progresivo (cfr. *The fire is burning*); (2) la coaparición con adverbios dinámicos (cfr. *If the fire is burning vigorously just within the door, it may not be possible to enter*

through the door [...]); (3) la coaparición con “adverbios de ritmo” (cfr. *Cover the embers thickly with green fresh leaves: they'll burn slowly with billows of smoke*); (4) la compatibilidad con expresiones durativas (cfr. [...] *a good log will burn for two days* [...]); (5) la compatibilidad con expresiones de término (cfr. *The sun here is very strong -- you can burn in an hour*); (6) el uso del predicado como modificador estativo (cf. *Can you switch the toaster off, put the pancake in or I'll have a burnt pancake*), y (7) la paráfrasis causativa (cfr. *They burnt the corpse*). El número de variables de un verbo viene determinado por el *Aktionsart* con el mayor número de variables, en nuestro caso la realización causativa (ej. [**do'** (x, Ø)] CAUSE [BECOME **burnt'** (y)]).

El siguiente paso en la descripción semántica de un predicado consiste en especificar las relaciones semánticas existentes entre los argumentos de una estructura lógica y su verbo. La GPR reconoce dos tipos de relaciones semánticas en función del nivel de generalidad: (i) los papeles temáticos y (ii) los macropapeles (MR) (Van Valin & LaPolla 1997; Van Valin 2005). Los papeles temáticos se definen en función de las posiciones argumentales en el continuo postulado por Van Valin (2005: 53-57). De este modo, el primer argumento del verbo *burn* “quemar” es el Effector y el segundo es el Paciente. Esta sección también explora las colocaciones más usuales para este verbo en el COCA: (i) el Tema que prende fuego a una entidad puede ser un agente humano (p.e. *militants, crowds, farmers, Daddy, hooligans*) o una entidad inanimada (p.e. *the acid, batteries, fire, sun, fireworks*); (ii) el Referente o la entidad que se quema puede ser: comida (p.e. *toast, steak, cakes, taters*), lugares (p.e. *town, city, village, field*), edificios (p.e. *house, church, theatre, factory, hangar*), papel (p.e. *registers, letter, photographs, envelope, files, copies, works, books, bills*), etc.

El último apartado de este capítulo propone una implementación programática de la construcción de movimiento causado *The fire burnt the house to the ground* en el Gramaticón de FunGramKB.

Capítulo 6

Conclusiones

Este último capítulo proporciona un resumen de los principales resultados y conclusiones que se pueden obtener del análisis de los dominios conceptuales del CAMBIO y del CAMBIO DE POSESIÓN en inglés. También se enumerarán varias sugerencias para futuras investigaciones vinculadas al tema de esta tesis doctoral.

Vamos a reconsiderar los objetivos iniciales de este trabajo y evaluar en qué medida se han cumplido. Uno de nuestros propósitos era examinar la realización sintáctica y la conceptualización de los dominios del CAMBIO y del CAMBIO DE POSESIÓN, con especial énfasis en dos grandes clases verbales, concretamente los verbos de cambio específico y los verbos de contribución. Por eso, era esencial encontrar el marco teórico más adecuado que pueda proporcionar explicaciones exactas para el carácter complejo de la interacción entre las configuraciones de bajo nivel y las construcciones de alto nivel. En este sentido, el capítulo 2 se centra en ocho de los modelos lingüísticos más importantes de la Gramática de Construcciones y aporta pruebas sólidas de la inadecuación de todos estos enfoques construccionistas como potenciales marcos teóricos para nuestra tesis. Además de señalar los defectos de estas posturas construccionistas, cada sección destaca los puntos de convergencia y divergencia entre estos enfoques y el modelo en el que esta tesis se basa, a saber el MLC. La variante de Fillmore y Kay ha sido descartada como marco teórico ya que, a diferencia del MLC, rechaza la composicionalidad de las construcciones y minimiza la importancia de las construcciones argumentales no-idiomáticas que constituyen precisamente el foco de interés de esta tesis. Este trabajo también hace uso del construccionismo de Lakoff (1987) con respecto a la predictibilidad semántica de la sintaxis y la organización de las construcciones gramaticales en redes radiales con un

miembro prototípico y miembros menos centrales relacionados entre sí mediante extensiones metafóricas y metonímicas. Sin embargo, la participación de Lakoff en el campo de la Gramática de Construcciones fue más bien ocasional (es decir, la contribución de este autor se limita a un estudio de caso aislado de las construcciones existenciales con “there” en inglés), puesto que su trabajo no se aplicó a otros tipos de construcciones.

Aunque la Gramática Cognitiva de Langacker se asienta sobre nociones fundamentales (p. e. el concepto de prominencia focal, la transparencia y la composicionalidad de las construcciones y la motivación semántica de la gramática), su tratamiento no es un modelo lingüístico completamente desarrollado y se decanta por las construcciones de bajo nivel en detrimento de las de alto nivel. La macro-perspectiva golbergiana atribuye el significado global de una oración a la construcción de alto nivel y no a las piezas léxicas que forman esa oración. De este modo, la construcción de movimiento causado en la oración *She sneezed the foam off the cappuccino* es la que aporta el sentido causal de cambio de lugar. Sin embargo, este enfoque es problemático. Si la interpretación de movimiento de la oración *She sneezed the foam off the cappuccino* fuese aportada sólo por la construcción de movimiento causado, como sugiere Goldberg, ¿por qué no se pueden integrar verbos similares en la misma construcción (cf. *She *breathed/*wheezed/*belched/*yawned the foam off the cappuccino*)? No es nuestra intención postular un nuevo significado para el verbo *sneeze* ‘estornudar’ (es decir ‘causar el movimiento de una entidad mediante el estornudo’), sino demostrar que la información semántica del verbo *sneeze* ‘estornudar’ es más compatible con una construcción de movimiento causado que la de los verbos *breathe* ‘respirar’, *wheeze* ‘resollar’, *belch* ‘eructar’, o *yawn* ‘bostezar’. El significado genérico de *sneeze* ‘estornudar’ es “arrojar con estrépito por la nariz y la boca el aire inspirado de manera

involuntaria, provocada por un estímulo en la mucosa nasal” (*WordReference Dictionary*). Por tanto, la fuerza de la expulsión del aire es lo que hace posible concebir una situación en la que una emisión violenta del aire causa la eliminación de las burbujas espumosas de la superficie de un líquido. La información semántica codificada por este predicado restringe el tipo del elemento Y (cf. el Condicionamiento Predicativo-Argumental del MLC) que puede ser ocupado por entidades ligeras (cf. *He sneezed ¿the plate/?the tray off the table*). La dirección del movimiento del aire también juega un papel importante en la incorporación de un dicho verbo en la construcción de movimiento causado. Los verbos *breathe* ‘respirar’, *wheeze* ‘resollar’, *yawn* ‘bostezar’ cubren tanto el proceso de inhalación como el de exhalación. Pero la construcción de movimiento causado puede fusionarse sólo con un verbo que describe un único flujo de energía moviéndose de una fuente de energía hasta la meta (cf. el modelo transitivo-causativo de la bola de billar de Langacker 1991ab). Puesto que sólo *sneeze* ‘estornudar’ y *belch* ‘eructar’ hacen referencia al proceso de exhalación, pueden ser considerados como posibles candidatos para la construcción de movimiento causado. Otro factor que contribuye a la incompatibilidad de los verbos *breathe* ‘respirar’, *wheeze* ‘resollar’, *yawn* ‘bostezar’ con la construcción de movimiento causado es que estos verbos perfilan un aspecto diferente de la expulsión del aire: su delicadeza (*breathe* ‘respirar’ ‘mover o soplar aire suavemente’; *yawn* ‘bostezar’ ‘abrir la boca para tomar mucho aire en los pulmones y soltarlo lentamente’) o el ruido producido (*wheeze* ‘resollar’ ‘respirar con dificultad, produciendo un silbido ronco’; *belch* ‘eructar’ ‘dejar pasar el aire del estomago fuera de la boca ruidosamente’). La principal deficiencia de la vertiente construccional de Goldberg reside en que sus principios generalizadores no sirven para explicar por qué algunos verbos se fusionan más fácilmente con una construcción

determinada que otros (cfr. *She #breathed/#wheezed/#belched/#yawned the foam off the cappuccino*).

Es cierto que en algunos casos las construcciones constituyen mejores vaticinadores del significado que los verbos. De este modo, el significado de transferencia de la oración *John kicked Tom the ball* está aportado claramente por la construcción ditransitiva que aumenta la valencia cuantitativa del predicado *kick* ‘patalear’. No obstante, el significado general de una oración no siempre viene determinado por las construcciones. Por ejemplo, el verbo *cost* ‘costar’ en la oración *The mistake cost him his job* es capaz de anular la interpretación de transferencia exitosa de la construcción ditransitiva. Rosca (2012d) también demuestra que en el caso de verbos como *feed* ‘alimentar’ o *pay* ‘pagar’ (por ej. *I fed him, I paid him*), el significado de transferencia no lo aporta la construcción ditransitiva. El papel de la construcción ditransitiva es el de la parametrización de la entidad transferida (por ej. *I fed him milk*), su cuantía (por ej *I paid him \$300*) o su medio (por ej *I paid him dollars*). Además, en el caso de estos dos verbos hay una combinación perfecta entre la semántica verbal y la construccional (cf. la Adecuación Plena del MLC). Al contrario de Goldberg (1995, 2006), el MLC adopta una perspectiva más amplia en cuanto a la carga semántica de las construcciones y de los verbos, ya que no hace caso omiso de la rica información semántica que proporcionan los verbos. El Condicionamiento de Variable Construccional estipula que las variables internas de un predicado pueden constreñir el carácter de los argumentos construccionales. Por consiguiente, el verbo *gather* ‘juntar’ enfatiza la homogeneidad del resultado del proceso de juntar entidades. Por eso, *gather* ‘juntar’ es solo compatible con un elemento *Z* que describe un todo coherente como en *She gathered her straggly hair into a bun* (véase también Rosca 2012c para más detalles).

Por su parte, la Gramática de Construcciones Radical, defendida por Croft, no puede optar a ser el marco teórico de este trabajo debido al carácter tipológico de su aparato explicativo y al rechazo de las relaciones sintácticas entre los elementos construccionales. La Semántica de Marcos de Boas y el MLC convergen en su interés por la semántica verbal como fuente de explicación y predictibilidad sintáctica. No obstante, la desventaja de esta propuesta consiste en una excesiva proliferación de ‘mini-construcciones’ y la escasa presencia de usos construccionales figurados debido a su baja productividad.

La mayor discrepancia entre la Gramática de Construcciones Corpórea y el MLC radica en que el primer modelo se centra en el procesamiento del lenguaje mientras que el segundo se enfoca en los procesos de producción de la lengua. La implementación computacional de la Gramática de Construcciones Fluida guarda poco parecido con la base de conocimiento FunGramKB. Además, los principios explicativos de esta rama de la CxG no pueden dar cuenta de la subsunción léxico-construccional.

Las limitaciones encontradas en estos modelos revelan la necesidad de un enfoque construccionista más potente que pueda explicar adecuadamente el complejo comportamiento construccionista de los predicados. Para este propósito, hemos utilizado las herramientas analíticas y explicativas del MLC, que estudia precisamente los principios que regulan la interacción de las unidades léxicas con las construcciones manteniendo un equilibrio entre los papeles de las construcciones de bajo y alto nivel. A diferencia de Goldberg y Boas, el MLC adopta un criterio más riguroso para la clasificación de las construcciones: (i) la idiomatidad/eventividad (p.e. la construcción de resultado es una construcción eventiva mientras que *What’s X Doing Y?* es idiomática con elementos fijos y variables); (ii) y la estratificación construccionista (*vid.*

cuatro niveles de descripción: argumental, implicativo, ilocutivo y discursivo). En consonancia con los principios, procesos y estructuras postulados dentro de la Lingüística Cognitiva, el MLC, en contraste con otros enfoques léxico-construccionales (por ej. Boas 2008ab, Iwata 2005, Nemoto 2005), da más prominencia a nociones cognitivas empíricamente validadas, como la confluencia, la metáfora y la metonimia de alto nivel. Por último, la mayor ventaja ofrecida por este modelo es su intención de conectar el campo lingüístico con el computacional mediante el proyecto de inteligencia artificial FunGramKB.

Como ya hemos mencionado en el capítulo 4, los verbos de cambio de estado específico pueden dividirse en tres grupos en función del esquema conceptual que emplean: (i) el primer grupo describe un incremento de tamaño (por ej. *bloom* ‘florecer’, *germinate* ‘germinar’, *swell* ‘hincharse’, *blister* ‘hacerse/formarse ampollas’) y selecciona el esquema A>A’, que indica la adquisición de una nueva propiedad (por ej. *Gorse blossomed gold on magnesium limestone embankments*; COCA 1994); (ii) el segundo grupo, que codifica una disminución de tamaño o un cambio negativo, destructivo (por ej. *burn* ‘quemar’, *rot* ‘pudrir’, *rust* ‘oxidarse’, *wither* ‘marchitarse’), puede combinarse tanto con el esquema A>A’ (por ej. *If it can’t be unscrewed (it may well have rusted solid), cut through the bolt with a junior hacksaw flush*; COCA 1992) o A>B (por ej. *The spinach wilted into nothing*); y (iii) el verbo *ferment* ‘fermentar’ no pertenece a ninguno de los dos grupos ya referidos puesto que no indica un incremento de tamaño ni un cambio de estado negativo. El esquema conceptual utilizado por este verbo es A>A’ (por ej. *The wine fermented into vinegar*, donde el vino y el vinagre son ambos líquidos). Estos esquemas de cambio, propuestos por Ruiz de Mendoza & Luzondo (2011), han sido sumamente útiles para la revisión de las construcciones de resultado e intransitiva de resultado. La construcción intransitiva de resultado puede

expresar un resultado simple o compuesto. El primero puede realizarse mediante un sintagma adjetival (por ej. [...] *a series of concentric burns blistered black* [...]; [...] *the crops rotted black in the ground*) o preposicional (por ej. [...] *this encounter blossomed into the most intense relationship of Goldman's life*; *Linen and lace had rotted into cobwebs on the beds* [...]). El segundo se puede codificar mediante una combinación de un adverbio y un sintagma adjetival (por ej. *Their throats would swell out big* [...], donde el adjetivo *big* ‘grande’ especifica el resultado descrito por el adverbio *out* ‘fuera’) o una combinación de un adverbio y un sintagma preposicional (por ej. [...] *she had blossomed out into a lovely womanhood* [...]; [...] *the upper parts of alder piles have been eroded down to a flat plain*, [...]). Un hallazgo interesante está relacionado con la afirmación de Luzondo (2011: 221) según la cual el esquema A>B no se puede codificar mediante un sintagma adjetival. Esta reivindicación queda invalidada por el ejemplo *His room grew dark; the fire burned dead* [...]. Además, este trabajo demuestra que el esquema A>A’ puede realizarse mediante un sintagma preposicional (por ej. *Scholz took out a meerschaum pipe that was burned to a dark orange and blew through it*; COCA 1982). Se ha notado también que a veces el sintagma adjetival que expresa un cambio de color puede separarse sintácticamente del verbo mediante el uso de preposiciones como *in* ‘en’ o *into* ‘dentro’. La oración *The flower bloomed in motley red* recibe la interpretación según la cual el color que cubre la superficie de la flor muestra distintos tonos.

La construcción intransitiva de causalidad se realiza sintácticamente mediante la configuración NP1 V *with/in/from/under* NP2, donde el segundo sintagma nominal indica la causa del evento descrito por el verbo. El segundo sintagma nominal puede ser un evento (por ej. [...] *their citizens' privacy rights are eroded with the initiation of the Decode deal*; Sketch engine doc#18108), un lugar (por ej.. *The camera blossomed in the*

hands of indigenous photographers [...]), una emoción (por ej. *And the mother's heart swelled big with anguish*) o un estado (por ej. *Frescoes generally became dark or decayed from moisture*). El primer grupo de verbos es más productivo, con preposiciones causales como *in* 'en' o *with* 'con' mientras que la gama preposicional para los verbos del segundo grupo es más amplia (por ej. *Do not tarnish your badge with a stain of corruption; [...] the petunias wilt in the heat [...]; But bells now rust from inactivity; Less-study pans might wilt under excessive heat [...]*). Para motivar el uso de preposiciones espaciales que expresan causalidad, el MLC postula la existencia de continuos de confluencias: ubicación en un contenedor > posesión del objeto > instrumentalidad > causalidad para *in* 'en' y compañía > posesión del objeto > instrumentalidad > causalidad <efecto para la preposición *with* 'con'. Aunque las construcciones L-Subject 'Lugar-Sujeto' comparten la sintaxis de las construcciones intransitivas de causalidad, es decir NP1 V *with* NP2, difieren en su significado. La posición de sujeto de una construcción Lugar-Sujeto está siempre ocupada por un sintagma nominal que indica un lugar como en *The orchard now blooms with apples*. Hemos alegado que tales oraciones están licenciadas por la metonimia de alto nivel UN PROCESO (EN UN LUGAR) POR UN EVENTO CAUSATIVO CON INSTRUMENTO, según el cual un lugar se concibe como capaz de hacer florecer mediante el uso de la entidad floreciente como instrumento de acción.

Según Levin (1993) los parámetros semánticos internos de un verbo sirven como vaticinadores de sus patrones sintácticos. Sin embargo, hemos demostrado que el criterio semántico de Levin no es totalmente fiable y que el comportamiento construccional de los verbos de contribución, es decir, la subsunción en la construcción dativa, se rige por los siguientes factores:

- (i) La ausencia de un recipiente animado que pueda cooperar en el evento de transferencia (p.e. *He donated his paintings to the museum*).
- (ii) La falta de complementariedad entre los papeles de sujeto (agente) y objeto indirecto (recipiente) o, en los términos de Langacker (1991), la ausencia de perfil de la relación de posesión (p.e. *The young woman was doling out candies to all the children in her yard*).
- (iii) La falta de voluntad de transferencia por parte del agente hace que el verbo de contribución sea incompatible con la construcción ditransitiva, que requiere la intención de transferencia del agente (por ej. *George ponied up \$ 3000 to Bob* but **George ponied Bob up \$ 3000*).
- (iv) Los esquemas de imagen que evocan algunos verbos (*vid.* movimiento fuera de un contenedor) los hacen más apropiados para la construcción dativa, como puede comprobarse en el ejemplo *The government has already disbursed a large amount of money to the private sector*. El verbo *disburse* “desembolsar”, que procede de la forma *desbourser* “sacar del bolso” (< *bourse* “bolso”), sugiere movimiento de una fuente hasta un destino, lo que explica la selección de la construcción dativa (por ej. **The government has already disbursed the private sector a large amount of money*).
- (v) El movimiento hacia un lugar diferente es más conspicuo que la relación de posesión entre un recipiente y un objeto (por ej. *My GP referred me to a specialist*).

En consonancia con las taxonomías lexemáticas de Faber y Mairal (1999), hemos propuesto nuestras jerarquías onomasiológicas para los verbos de cambio de estado específico y los verbos de contribución. Los resultados de esta parte concuerdan con la hipótesis de Faber y Mairal (1999) según la cual la estructura conceptual de un verbo

funciona como vaticinador del comportamiento sintáctico de ese verbo. Los verbos que heredan la estructura semántica de su *genus* ‘predicado de orden superior’ tienden a comportarse sintácticamente como sus predicados de orden superior. Así, el verbo *dispense* ‘repartir’ puede participar en la construcción dativa como su predicado de orden superior *distribute* ‘distribuir’ (por ej. *She regularly dispensed medicines to “those not in acute distempers” [...] vs. The cughtagh [...] distributed gifts to the needy folk in hill villages*).

Nuestro segundo objetivo era describir como la información lingüística relacionada con estas dos clases verbales puede ser tratada computacionalmente en un sistema de procesamiento de lenguaje natural, concretamente el FunGramKB. A pesar de estar claramente separados, el nivel lingüístico (en nuestro caso el Lexicón y el Gramaticón) está vinculado con el nivel conceptual (en este caso la Ontología) mediante el Constructor de la Estructura Lógica Conceptual. Las relaciones entre los conceptos ontológicos son similares a las relaciones existentes dentro de las jerarquías verbales. Los conceptos básicos están relacionados a los conceptos de orden superior mediante mecanismos de herencia. Por ejemplo, la relación de herencia entre +BURN_00 y +DAMAGE_00 está marcada por la presencia del concepto de orden superior +DAMAGE_00 en la primera predicación de +BURN_00. También, el postulado de significado de un concepto de orden inferior contiene una propiedad distintiva (*differentiae*) que no está presente en el postulado de significado de su concepto de orden superior. En el capítulo 5 se describe el proceso que los lexicógrafos de FunGramKB llevan a cabo para asignar los verbos a un cierto *Aktionsart* o rellenar la información relacionada a los patrones construccionales de los verbos.

Varias sugerencias deberían considerarse para el desarrollo de futuros trabajos de investigación a partir de esta tesis. En primer lugar, nuestro corpus de datos podría expandirse para incluir las clases de cambio de posesión, como por ejemplo las listas de Levin (1993) de los verbos “satisfactorios” (*fulfilling*), de posesión futura, de tener y de obtener. Aunque este último grupo verbal no participa en la construcción ditransitiva o dativa, sería interesante examinar los principios que bloquean su fusión con estas construcciones. No obstante, algunos de los verbos pertenecientes a estos grupos han sido ya brevemente analizados en este trabajo (cfr. *leave* “dejar”, *promise* “prometer”, *offer* “ofrecer” como verbos de posesión futura; *entrust* “encomendar” como verbo “satisfactorio”), pero haría falta un examen más refinado.

Un estudio comparativo entre diferentes lenguas podría resultar útil para arrojar luz sobre el modo en el que otras culturas conceptualizan el dominio del cambio y el de cambio de posesión. Contrastar los patrones construccionales del inglés para los verbos de cambio de estado y de contribución con otras lenguas (preferentemente sin vinculación entre sí) serviría para validar o rebatir las hipótesis formuladas hasta el momento. Finalmente, es nuestro propósito incorporar la información relacionada con las construcciones ditransitiva y dativa en el Gramaticón de la base de conocimiento FunGramKB.

