

A Cognitive Linguistics View of Terminology and Specialized Language

Applications of Cognitive Linguistics

20

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A Cognitive Linguistics View of Terminology and Specialized Language

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1. Introduction

Pamela Faber

This book explores the importance of Cognitive Linguistics for Terminology and specialized language¹ in general. Cognitive Linguistics is understood here in its broadest sense, and includes not only work on metaphor and grammar, but also other cognitive-oriented theories such as Construction Grammar (Goldberg 1995, 2005), Cognitive Semantics (Talmy 2000), Conceptual Semantics (Jackendoff 1983, 1990, 1997), and Frame Semantics (Fillmore 1968, 1975, 1976ab, 1982, 1985). Cognitive Linguistics is an attractive linguistic paradigm for the analysis of specialized language and the terminological units that characterize it. The emphasis placed by Cognitive Linguistics on conceptual description and structure, category organization, and metaphor coincides to a certain extent with crucial areas of focus in Terminology, such as scientific ontologies, the conceptual reference of terminological units, the structure of scientific and technical domains, and specialized knowledge representation.

However, until now, Terminology has been generally reticent about using linguistic models to analyze the semantics of terminological units, and the structure of specialized language texts². Existing studies and manuals in Terminology tend to restrict themselves to a description of practical matters regarding database organization, information extraction, term entry design, language planning, etc. In the same line, research on specialized language texts generally limits itself to highlighting salient aspects of scientific discourse, such as the use of the passive voice and the concentration of semantic information in complex nominal forms. Nevertheless, such observations, though useful, are merely anecdotic if they are not placed within the richer context of a wider theoretical framework.

In a parallel way, specialized language is an interesting area of application for Cognitive Linguistics. One might ask what is so special about specialized language, why it is different from general language, and why it is worth studying in itself. Although specialized language is undoubtedly language, and thus

1. We prefer the term *specialized language* to *language for specific purposes*, which is much more general.

2. An important exception in this respect is Temmerman (2000).

possesses many of the same features as general language, it also can be said to have distinctive characteristics because of the semantic load of terminological units, which designate entities and processes within a scientific or technical field. When used in specialized discourse, these units activate sectors of the specialized domain in question, highlighting configurations of concepts within the specialized field.

Although since the times of Aristotle, figurative language seems to have been officially banished from the realm of scientific communication, metaphor is also present in specialized language as well as specialized language discourse. This is only natural since metaphor is an integral component of our cognition which shapes our understanding of the world. However, metaphor in specialized language has not received the same amount of attention as metaphor in general language. This is true within the context of Cognitive Linguistics and of linguistic theory in general.

In fact, one still encounters authors who affirm that figures of speech are out of place in scientific texts and that science prefers the literal to the non-literal term when this is simply not the case. As Kuhn (1993) points out, metaphors are not marginal, but instead are a crucial part of the way in which a scientific field reproduces itself. For example, metaphors are commonly used to introduce vocabulary and basic models into scientific fields: “their function is a sort of *catachresis* – that is, they are used to introduce theoretical terminology where none previously existed” (Boyd 1993). Nevertheless, the role of metaphor in Science goes beyond this as can be seen when scientific terminology is analyzed at various levels, namely, those found at the level of: (1) specialized knowledge domain; (2) specialized language unit; (3) proposition; and (4) text (Faber and Márquez Linares 2004).

Within a much wider context, it is also true that metaphor is necessary for building models and elaborating scientific theory. Halloran and Bradford (1984: 183) affirm: “No synthesis could ever be achieved, no models postulated, no paradigms established if science relied wholly upon ‘careful observation’ for its theories. Model-building requires an inductive leap; carefully recorded examples must be synthesized into a logical premise, and then be further verified and expanded by traditional scientific method. For this, science must exploit the power of metaphor.”

Evidently, metaphor is a dynamic mechanism, essential for the elaboration and evolution of a scientific theory and not only used as an explanatory device. In this sense, it can be regarded as more of a building block than a scaffold. However, an in-depth inquiry into the role of metaphor in the construction of scientific theories goes far beyond the scope of this book, which focuses on the semantics and pragmatics of scientific terminology and specialized language

texts. All of our observations and assertions are illustrated and supported by examples drawn primarily from the fields of Medicine and Environmental Science. Even though the importance of metaphor for theory-building will be acknowledged, it will not be a principal area of focus.

The importance of Cognitive Linguistics as a methodological framework for the study of Terminology and specialized language is highlighted in this book. In this respect, we believe that scientific language is not merely a register, but important as an object of study in itself. As such, it is of interest for Cognitive Linguistics.

Specialized language texts have unique characteristics. Because their general function is usually the transmission of knowledge, they are characterized by a greater repetition than usual of terms, phrases, sentences, and even full paragraphs. This can also mean that the text shows similarities in the syntactic constructions used. Such texts are also terminology-rich because of the quantity of specialized language units in them.

Specialized language units are generally represented by compound nominal forms. They are used within a scientific or technical field, and have meanings specific of this field. The heavy concentration of such units in these texts points to the specific activation of sectors of domain-specific knowledge. As a result, understanding a terminology-rich text requires knowledge of the domain, the concepts within it, the propositional relations within the text, as well as the conceptual relations between concepts within the domain. This is a key factor in the translation of scientific and technical texts by a translator, who is obliged to quickly attain the knowledge threshold necessary to understand the entities and processes described in the source text. The need for rapid knowledge acquisition is one of the reasons that specialized domains and their structure are an important area of focus in Terminology in the form of scientific ontologies.

This book is of interest to scientists, linguists, terminologists, technical writers, translators, as well as university students who are working in and/or studying aspects of applied linguistics, terminology management, scientific and technical translation, specialized knowledge representation, or cognitive linguistics. Evidently, an important part of learning how to understand, write, analyze, and/or translate specialized texts is the acquisition of skills and strategies to deal with the terminology that encodes expert knowledge in the specialized domain. Not only is it a question of understanding specialized knowledge units and being able to link them to other concepts in the same or different language, but also of storing the knowledge acquired in a useful way so that it can be activated in other contexts. This book is also of interest to teachers who must teach applied linguistics, scientific writing, terminology and translation subjects from a cognitive perspective, and who until now have been obliged to largely

rely on their own resources because there are currently few if any such books that specifically focus on specialized language.

The methodology used for the study and analysis presented in this volume is in consonance with the Communicative Theory of Terminology (Cabr  1999a, 1999b) and the Sociocognitive approach to Terminology (Temmerman 2000). Our theoretical approach is known as Frame-based Terminology (Faber, M rquez Linares, and Vega Exp sito 2005; Faber et al. 2006, 2007). It is based on Mart n Mingorance's Lexical Grammar³ (Mart n Mingorance 1984, 1989, 1995; Faber and Mairal Us n 1999) and Frame Semantics (Fillmore 1982, 2006; Fillmore and Atkins 1998), which is applied to specialized language with a view to specifying knowledge structures.

For the codification of specialized knowledge and the analysis of corpus data, the Lexical Grammar Model is used. This model facilitates the representation of conceptual and collocational relations. The lexical organization which the Lexical Grammar Model proposes for the lexicon is based partially on the distinction between syntagmatic and paradigmatic relations, and the complementary principles of combination and selection (Saussure [1916] 1990; Lyons 1977: 241). This distinction is relevant because it underlies conceptual organization, independently of the linguistic system (Nelson 1985: 179).

The paradigmatic axis of the Lexical Grammar Model codifies the configuration of concepts in the selection axis, conceptually organizing the lexicon in a hierarchy of domains and subdomains. In a parallel way, it is a determining factor in the syntagmatic axis, which codifies a term's combinatorial potential. The convergence of these two axes is the basis of conceptual structure for general as well as specialized language.

The relational approach proposed in this book focuses on meaning, and more concretely, on conceptual domains. It is based on the premise that there are a series of properties shared by all of the member concepts within a domain, and other properties that differentiate them. Semantic memory is represented as a complex network in which each node is a concept, and in which the concepts are interconnected by a wide range of different types of relations within a frame-like structure.

Frame Semantics is the latest development of Case Grammar (Fillmore 1968, 1975, 1976a, 1976b, 1977, 1982, 2006). The FrameNet project (Fillmore and Atkins 1998; Fillmore, Johnson, and Petruck 2003; Fillmore et al. 2003; Atkins, Rundell and Hiroaki 2003) is based on this theory. Its objective is the description of lexical meaning by extracting contextual information from a large corpus of texts, and structuring this meaning in cognitive frames.

3. This model was previously known as the Functional-Lexematic Model.

Although since the publication of *Collins Cobuild*, there have been many corpus studies, the originality of FrameNet stems from the fact that a frame includes all the possible constellations of frame elements. This complements the traditional morphosyntactic information in each entry. Furthermore, each meaning is linked to a set of contextual information extracted from a corpus. The basic concept underlying this linguistic approach is that of the frame, which can be defined as a general or specific structure with entities that participate in these structures. Up until now, frames have only been applied to general language and not to specialized language.

Our approach also adheres to the communicative situational perspective, where words as well as terms can only be understood within the contexts in which they appear (Fillmore et al. 2003; García de Quesada 2001; Montero Martínez and García de Quesada 2003; Seibel 2004a; Reimerink et al. 2010). Like FrameNet, we also use corpus analysis (Fillmore 1994; Ruppenhofer et al. 2010; C. Pérez Hernández 2002; Faber et al. 2006; Tercedor Sánchez and López Rodríguez 2008). Still another similarity resides in the fact that we also provide information on the semantics as well the syntactic behavior of the items under analysis (Faber and Mairal Usón 1999; Ruppenhofer et al. 2010; Faber et al. 2006). Furthermore, in our study of specialized language, we study aspects of language that were originally restricted to the field of general language such as metaphor (Faber and Márquez Linares 2004, Ureña Gómez-Moreno 2010, 2011). We also go beyond terms in a Wüsterian sense by analyzing how terminological units acquire their specialized meaning, and the extent to which specialized situational settings have a hand in this (Cabré 1999a, 1999b, 1999c; Temmerman 2000).

Nonetheless, our approach differs from FrameNet in that a prototypical domain event provides a frame for the basic processes that take place within the specialized field. Within this context, concepts are organized around an action-environment interface (Barsalou 2003, 2008; Faber, Márquez Linares, and Vega Expósito 2005). The second thematic section of this book introduces basic concepts, theories, and applications in Terminology and Cognitive Linguistics that are relevant to the following chapters. The chapters in the third section describe terms as specialized language units from a semantic and pragmatic perspective, and explain the Frame-based Terminology approach. The fourth section analyzes the role of contextual information in specialized knowledge representation, more specifically as reflected in linguistic contexts and graphical information. The book ends with the conclusions that can be derived from this study.

2. Basic concepts

This section of the book discusses the concepts and premises that underlie the vision of specialized language semantics and pragmatics as well as the role of contextual information in knowledge representation. Chapter 2.1 describes the role of specialized language in society, and traces the evolution of Terminology theory from its beginnings with special emphasis on the cognitive shift that has taken place over the last decade, and which has placed it firmly within the scope of Cognitive Linguistics. Chapter 2.2 discusses metaphor and metonymy as cognitive phenomena, and highlights the fuzzy boundary between the two. Metaphor and metonymy are presented as mechanisms of lexical creation and extension in specialized language as well as in general language. In this regard, particular emphasis is placed on the Invariance Principle, conceptual blending, and the indeterminacy of domains. The section concludes with a corpus-based study of metaphor in Environmental Science.

Chapter 2.3 explores specialized language translation as a cognitive process and application of Cognitive Linguistics. It discusses the translation process as applied to specialized language texts, and underlines the role of terminology management in the interlinguistic mediation of such tasks. In this regard, there is a lack of terminographic resources capable of meeting the needs of translators and technical writers. It suggests that Cognitive Semantics could provide the theory of meaning that translation is so sorely in need of. Nevertheless, despite the fact that translation is a fertile testing ground for the Cognitive Commitment and the Generalization Commitment, Cognitive Linguistics has had relatively little to say about translation. This is paradoxical since linguistic theory as developed by Langacker, Lakoff, and Fillmore is particularly relevant to specialized language texts, the representation of specialized knowledge units, translation correspondence, and the elusive *tertium comparationis*.

2.1 Terminology and specialized language

Pamela Faber, Clara Inés López Rodríguez

2.1.1 Introduction

Terminology or specialized language is more than a technical or particular instance of general language. In today's society with its emphasis on science and technology, the way specialized knowledge concepts are named, structured, described, and translated has put terminology or the designation of specialized knowledge concepts in the limelight.

The information in scientific and technical texts is encoded in terms or specialized knowledge units, which are access points to more complex knowledge structures. Underlying the information in the text are entire conceptual domains, which are both explicitly and implicitly present, and which represent the specialized knowledge encoded. In order to create a specialized text, translators and technical writers must have an excellent grasp of the language in the conceptual domain, the content that must be transmitted, and the knowledge level of the addressees or text receivers. In order to translate a specialized language text, translators must go beyond correspondences at the level of individual terms, and be able to establish interlinguistic references to entire knowledge structures. Only then can they achieve the level of understanding necessary to create an equivalent text in the target language.

2.1.2 Specialized knowledge acquisition

There has been a great deal of debate regarding how much a translator or technical writer really needs to know about the specialized domain in order to translate or write about a scientific or technical text. Some people even seem to believe that such texts should only be translated or written by experts in the field because, in their opinion, it is impossible for non-experts to acquire the necessary knowledge.

Although it is not infrequent for experts with an acceptable level of a second language to try to write or translate texts because of their knowledge of terminological correspondences, they generally find that writing an article in another language is far from simple. Similarly, there are writers or translators who believe that their syntactic and semantic knowledge of one or more lan-

guages guarantees an adequate scientific or technical text in the same language or another language without any other previous preparation or documentation. Both endeavors can be extremely difficult to perform successfully.

The reason for this lies in the fact that specialized languages are not a series of water-tight compartments. Terminological units and their correspondences possess both paradigmatic and syntagmatic structure. In other words, terms not only represent specialized concepts, but also have syntax and collocational patterns within general language. In this sense, merely knowing terminological correspondences is often not enough since such units, when inserted in context, affect the text at all levels.

However, it also must be said that linguistic knowledge in itself is not a sufficient guarantee to produce an acceptable text in a specialized knowledge field. A translator or technical writer must likewise be aware of the types of conceptual entities that the text is referring to, the events that they are participating in, and how they are interrelated. This signifies that writers and translators of specialized texts must also be closet terminologists and be capable of carrying out terminological management as a means of knowledge acquisition. This is one of the reasons why an understanding of terminology and specialized knowledge representation is a key factor in successful scientific and technical text generation and translation.

2.1.3 Terminology as a discipline

Terminology as a discipline of study is a relative newcomer. In fact, it came into being because of the growing need to facilitate specialized communication and translation, as well as knowledge transfer between text users belonging to different language communities and with similar knowledge levels. The theoretical proposals in this field have been mostly practice-based, and focus on the elaboration of glossaries, specialized dictionaries as well as terminological and translation resources. According to Cabré (2000a: 37), “as a subject field with explicit premises, terminology emerges from the need of technicians and scientists to unify the concepts and terms of their subject fields in order to facilitate professional communication and the transfer of knowledge”. Precisely for this reason, Terminology has been for some time a discipline in search of a theory with premises capable of accounting for specialized knowledge representation, category organization, and description, as well as the semantic and syntactic behavior of terminological units in one or various languages. Over the years, this quest for a set of theoretical principles has led terminologists to ask themselves *inter alia* whether Terminology should be regarded as a branch of Philosophy, Sociology, Cognitive Science, or Linguistics (to name a few).

Rather than say that Terminology may stem from any or all of them, we take the position that Terminology is essentially a linguistic and cognitive activity. In this sense, terms are linguistic units which convey conceptual meaning within the framework of specialized knowledge texts. In the understanding of the nature of terms, this process of meaning transmission is as important as the concept or concepts that they designate. Terminological units are thus subject to linguistic analysis. Since this type of analysis can be carried out in a number of ways, it is necessary to choose the linguistic approach most in consonance with the object of study. Such an approach should be lexically-centered and usage-based. It should also have its primary focus on meaning and conceptual representation. As shall be seen, such is the case of theoretical approaches based on Cognitive Linguistics.

In the past, Terminology and Linguistics have mostly ignored each other. In its initial phase, Terminology was interested in asserting its independence from other knowledge areas, and creating a totally autonomous discipline. This goal led terminologists to go to great lengths to emphasize differences between Terminology and Lexicology even to the extent of affirming that terms are not words. In a parallel way, linguistic theory has largely ignored Terminology, probably because specialized language has been and is often regarded as merely a special case of general language. Thus, it was not considered worthy of serious study because anything pertaining to general language was also presumed to be true of specialized language.

However, interesting conclusions about specialized language, scientific translation, and language in general can be obtained when terminology is studied in its own right. As such, it is most certainly susceptible to linguistic analysis within the framework of a linguistic model. Oddly enough, some years ago this seemingly innocuous affirmation would have caused quite a hue and cry in terminological circles. The reason for this was that the first approximations to terminology had normalization as a primary objective. Great pains were taken to strive for totally unambiguous communication through standardization. This signified univocity or one-to-one reference between term and concept. The fact that the majority of terms designate concepts that represent objects in a specialized knowledge field meant that such an objective seemed possible to achieve. Nevertheless, it soon became apparent that this was more a *desideratum* than a realistic goal.

2.1.4 Theories of Terminology

As has often been observed, *terminology* means many things to many people (Sager 1994: 7). Terminology is a word that can either begin with an upper or

lower-case letter. When terminology begins with a small *t*, it refers to the units in any specialized knowledge field. When it begins with a large *T*, it refers to the study of specialized language. As a rule, Terminology theories can be classified as either prescriptive or descriptive. General Terminology Theory, which has the virtue of being the first theoretical proposal in this area, is essentially prescriptive in nature. As shall be seen, the theories that subsequently arose in reaction to the General Terminology Theory are descriptive, and show an increasing tendency to incorporate premises from Cognitive Linguistics since they focus on the social, communicative, and cognitive aspects of specialized knowledge units. The vision that they offer is more realistic because they analyze terms as they actually appear and behave in texts. One might say that these new theories are representative of a *cognitive shift* in Terminology.

2.1.4.1 General Terminology Theory

Terminology as a discipline began in the 1930's with Eugen Wüster, the author of *The Machine Tool, an Interlingual Dictionary of Basic Concepts* (Wüster 1968), a systematically organized French and English dictionary of standardized terms (with a German supplement) intended as a model for future technical dictionaries.

This multi-volume work inspired the General Terminology Theory, and set out the initial set of principles for the compilation and description of terminological data with a view to the standardization of scientific language. The General Terminology Theory was later developed in Vienna by Wüster's successors, who interpreted his ideas and carried on his work. Although for many years, the General Terminology Theory offered the only set of principles and premises for compiling terminological data, its view of the semantics of terminological units projected a uniformly limited representation of specialized knowledge concepts without allowing for their multidimensional nature. Needless to say, the General Terminology Theory did not attempt to account for the syntax and pragmatics of specialized language, which was not regarded as relevant. In this sense, it could not be usefully applied to translation or specialized text generation.

The General Terminology Theory focused on specialized knowledge concepts for the description and organization of terminological information. Within this framework, concepts were viewed as being separate from their linguistic designation (terms). Concepts were conceived as abstract cognitive entities that refer to objects in the real world, and terms were merely their linguistic labels.

As Terminology struggled to acquire a semi-independent status, a considerable amount of effort was invested in distinguishing specialized language from

general language and in differentiating terms from words. This radical emphasis on differences often seemed to convey the idea that terms were not even language at all, but rather abstract symbols referring to concepts in the real world.

One of the basic assertions of General Terminology Theory (Wüster 1979; Felber 1984) is that terms in specialized language are inherently different from general language words because of the monosemic reference between terms and concepts. The general claim is that a term or a specialized language unit can be distinguished from a general language word by its single-meaning relationship with the specialized concept that it designates and by the stability of the relationship between form and content in texts dealing with this concept (Pavel and Nolet 2001: 19).

However, this is an extremely idealized vision of specialized communication. Even the most cursory examination of specialized language texts shows that terminological variation is quite frequent, and that such variation seems to stem from parameters of specialized communication, such as the knowledge and prestige of the speakers, text function, text content, user group, etc. The same concept can often be designated by more than one term, and the same linguistic form can be used to refer to more than one concept. Furthermore, terms have distinctive syntactic projections and can behave differently in texts, depending on their conceptual focus. This is something that happens in texts of all languages, and is a problem that translators and technical writers inevitably have to deal with.

Since Wüster believed that the function of Terminology was to create and standardize names for concepts, syntax was not regarded as falling within the scope of Terminology. The General Terminology Theory also regarded Terminology as exclusively synchronic, and thus ignored the diachronic dimension of terms. Wüster's principal objectives (in Cabré 2003: 173) were:

- “To eliminate ambiguity from technical languages by means of standardization of terminology in order to make them efficient tools of communication;
- To convince all users of technical languages of the benefits of standardized terminology;
- To establish terminology as a discipline for all practical purposes and to give it the status of a science”.

Cabré (2000a: 169) rightly points out that Terminology has suffered from a lack of innovative theoretical contributions because until very recently, there has been little or no theoretical discussion or confrontation of opinions. Another possible reason for the slow development of Terminology is the lack of interest shown by specialists in other areas of knowledge, such as Linguistics:

The fifth reason, which may explain the continued homogeneity of the established principles, is the lack of interest in terminology by specialists of other branches of science, for example linguistics, psychology, philosophy and history of science and even communication and discourse studies. For many years terminology saw itself as a simple practice for satisfying specific needs or as a field of knowledge whose signs had nothing to do with the signs of language.

However, the 1990s brought new proposals and ideas that paved the way to integrating Terminology into a wider social, communicative, and linguistic context. According to L'Homme, Heid, and Sager. (2003), examples of such approaches are Socioterminology (Boulanger 1991; Guespin 1991; Gaudin 1993, 2003), the Communicative Theory of Terminology (Cabr  2000a, 2000b, 2001a, 2001b, 2003; Cabr  et al. 1998), and Sociocognitive Terminology (Temmerman 1997, 2000, 2001, 2006).

2.1.4.2 Social and communicative Terminology theories

In the early 1990's Socioterminology and Communicative Terminology Theory appeared on the horizon as a reaction to the hegemony of the General Terminology Theory. Both theories present a more realistic view of Terminology since they base their description on how terms are actually used in communicative contexts. They describe terminological units in real discourse and analyze the sociological and discourse conditions that give rise to different types of texts.

Socioterminology

Socioterminology, as proposed by Gaudin (1993), applies sociolinguistic principles to Terminology theory, and accounts for terminological variation by identifying term variants against the backdrop of different usage contexts. Parameters of variation are based on the social and ethnic criteria in which communication among experts and specialists can produce different terms for the same concept and more than one concept for the same term.

Pihkala (2001) points out that the socioterminological approach focuses on the social and situational aspects of specialized language communication, which may affect expert communication and give rise to term variation. According to socioterminologists, standardization is a chimera since language is in constant change. Polysemy and synonymy are inevitably present in terminology and specialized texts, and the use of one term instead of another can reflect the knowledge, social, and professional status of a group of users, as well as the power relationships between participants in the communicative interaction. It can also reflect the geographic and temporal location of the text sender or originator. Terminological variation inevitably highlights the fact that concept

systems and definitions are not static. This is a reality that any theory aspiring to explanatory adequacy must deal with. In this respect, the premises of Socioterminology are closely linked to Gregory and Carroll's (1978: 3–4) characterization of linguistic variation according to use and user even though this reference is not explicitly mentioned.

Although Socioterminology does not aspire to independent theoretical status, its importance resides in the fact that it opened the door for other descriptive theories of Terminology, which also take social and communicative factors into account, and which base their theoretical principles on the way terms are actually used in specialized discourse.

The Communicative Theory of Terminology

Linguistics and Terminology began to draw closer to each other with the Communicative Theory of Terminology (Cabr  1999a, 1999b, 1999c, 2000a, 2000b, 2001a, 2001b, 2003; Cabr  et al. 1998). This proposal is more ambitious than Socioterminology and endeavors to account for the complexity of specialized knowledge units from a social, linguistic, and cognitive perspective.

According to Cabr  (2003), a theory of Terminology should provide a methodological framework for the study of terminological units. She underlines the fact that specialized knowledge units are multidimensional, and have a cognitive component, a linguistic component, and a sociocommunicative component. In this respect, they behave like general language words. Their specificity resides in a series of cognitive, syntactic, and pragmatic constraints, which affirm their membership in a specialized domain.

In this sense, the Communicative Theory of Terminology regards terminological units as "sets of conditions" (Cabr  2003: 184) derived from, *inter alia*, their particular knowledge area, conceptual structure, meaning, lexical and syntactic structure, and valence, as well as the communicative context of specialized discourse. Cabr  (2003) proposes the *Theory of the Doors*, a metaphor representing the possible ways of accessing, analyzing, and understanding terminological units. She compares a terminological unit to a polyhedron, a three-dimensional solid figure with a varying number of facets. Similarly, a terminological unit can also be said to have three dimensions: a cognitive dimension, a linguistic dimension, and a communicative dimension. Each is a separate door through which terminological units can be accessed. Nonetheless, one's choice of door (or focus) does not entail a rejection of the other two perspectives, which continue to reside in the background. According to Cabr , the Communicative Theory of Terminology approaches units through the language door, but always within the general context of specialized communication.

At this time the Communicative Theory of Terminology is probably the best candidate to replace the General Theory of Terminology as a viable, working theory of Terminology. It has led to a valuable body of research on different aspects of Terminology such as conceptual relations, terminological variation, term extraction, and the application of different linguistic models to Terminology. This has helped Terminology as a field to get its act together, and begin to question the premises of General Terminology Theory, which previously were not open to doubt or criticism.

However, the Communicative Theory of Terminology is not without its shortcomings. Despite its clear description of the nature of terminological units and the fact that it mentions a term's "syntactic structure and valence", the Communicative Theory of Terminology avoids opting for any specific linguistic model. The relation of the Communicative Theory of Terminology to Linguistics is more in the nature of a light flirtation with various models than a monogamous relationship with any one model in particular. Its view of conceptual semantics is also in need of clarification. Although in a very general way, the Communicative Theory of Terminology bases its semantics on conceptual representation, it is more than a little vague when it comes to explaining how such representations are created, what they look like, and what constraints they might have:

Cabré (2003: 189) states that the knowledge structure of specialized discourse could be represented as a conceptual map formed by nodes of knowledge, which can be represented by different types of units of expression, and by relations between these nodes. Within this framework, terminological units are recognized as such because they represent knowledge nodes of a structure, and have a special meaning in this structure. If these factors are the prerequisites for term status, then one would think that conceptual representation, knowledge structure or ontology, and category organization would be an extremely important part of the Communicative Theory of Terminology. However, this does not seem to be the case.

Another area in need of clarification in the Communicative Theory of Terminology is semantic meaning. According to this theory, a lexical unit is general by default and acquires a specialized meaning when it appears in a specific type of discourse. A terminological unit is regarded as the specialized meaning of a lexical unit since its meaning is extracted from the "set of information of a lexical unit" (Cabré 2003: 184). With this affirmation, the Communicative Theory of Terminology seems to be avoiding the question of what specialized meaning is and what its components are. The only clue provided is when Cabré (2003:190) states that terminological meaning consists of a specific "selection of semantic features according to the conditions of every speech act", which

seems to implicitly say that she is in favor of some type of semantic decomposition. However, this can only be a supposition because nothing is explicitly said about the semantic analysis of specialized language units. This is a comfortable position because it shunts any decisions in this respect back into the realm of Lexical Semantics, where there is already considerable disagreement as to the nature of word meaning and how it should be analyzed.

2.1.4.3 Cognitive-based theories of Terminology

Over the last decade, linguistic theory seems to be in the process of undergoing a cognitive shift (Evans and Green 2006), which has led it to increasingly focus on the conceptual network underlying language. The fact that linguistic form cannot be divorced from meaning has led linguists to begin to explore the interface between syntax and semantics (Faber and Mairal Usón 1999). This trend is also present in the area of Terminology.

Cognitive-based Terminology theories, though similar in some ways to the Communicative Theory of Terminology, also differ from it. It is not an accident that such theories have arisen largely in the context of Translation. Despite the fact that they also focus on terms in texts and discourse, they make an effort to integrate premises from Cognitive Linguistics and Psychology in their accounts of category structure and concept description. Relevant proposals in this area are Sociocognitive Terminology (Temmerman 1997, 2000, 2006) and Frame-based Terminology (Faber, Márquez Linares, and Vega Expósito 2005; Faber et al. 2006, 2007; Faber and León Araúz 2010; Faber 2011).

Sociocognitive Terminology

Insights from Cognitive Semantics (e.g. prototype structure and metaphor) began to have an impact on Terminology theory with the advent of Sociocognitive Terminology as proposed by Temmerman (1997, 2000). Sociocognitive Terminology concentrates on the cognitive potential of Terminology in domain-specific language and on terminological variation as related to verbal, situational, and cognitive contexts in discourse and in a wide range of communicative environments (Temmerman, Kerremans, and Vandervoort 2005).

Temmerman (2000: 16) criticizes General Terminology Theory, and offers examples from the Life Sciences to demonstrate that the basic principles of the General Terminology Theory are unrealistic and incapable of describing or explaining specialized language as it is actually used in communicative situations, such as specialized translation. The Wüsterian premises questioned are the following:

- Concepts have a central role in regards to their linguistic designations.
- Concepts and categories have clear-cut boundaries.
- Terminographic definitions should always be intensional.
- Monosemic reference is the rule in terminology, where there is a one-to-one correspondence between terms and concepts.
- Specialized language can only be studied synchronically.

Temmerman (2000) argues that these premises are not valid, and asserts that:

- Language cannot be regarded as divorced from concepts since it plays a crucial role in the conception of categories.
- Many categories have fuzzy boundaries and cannot be clearly defined.
- Optimal definition structure and type should not be limited to only one mode and ultimately depend on the concept being defined.
- Polysemy and synonymy frequently occur in specialized language and must be included in any realistic terminological analysis.
- Categories, concepts, as well as terms evolve over time and should be studied diachronically. In this sense, cognitive models play an important role in the development of new ideas.

This declaration of principles is the launching pad for Sociocognitive Terminology. This theory is also in consonance with Gaudin's Socioterminology and Cabré's Communicative Theory of Terminology since it is descriptive rather than prescriptive, and regards terms as the starting point for terminological analysis. However, in the same way as the other approaches, it has very little to say about the syntactic behavior of terms.

What makes Sociocognitive Terminology different from other theories is its emphasis on conceptual organization, and its focus on category structure from the perspective of Cognitive Linguistics. While concept systems in the General Terminology Theory are organized in terms of *type_of* and *part_of* conceptual relations, sociocognitive categories are said to have prototype structure, and conceptual representations initially take the form of cognitive models. Another significant difference is that Sociocognitive Terminology is perhaps the first and only approach to truly take on board the historical or diachronic dimension of terms.

Temmerman (1997, 2001) analyzes three concepts from the same general domain of Biology, and comes to the conclusion that only one of them can be adequately described by the methods of the General Terminology Theory. The other two are much more susceptible to sociocognitive terminological methods. She claims that such methods give less prominence to traditional ways of defining concepts (generic term and differentiating features), and focus more

on deriving term definitions from their use in text corpora. The way a concept is described may vary, depending on a number of different parameters e.g. the type of category being defined, the knowledge level of the text sender and the receiver, and the profile of the termbase user (Temmerman and Kerremans 2003).

Category structure is prototypical, and the representations of relations between concepts in this framework are in the form of idealized cognitive models of the sort proposed by Cognitive Linguistics. Idealized cognitive models were first proposed by Lakoff (1987) in order to account for *typicality effects*, the phenomena whereby a particular instance is judged as being a good example of a given category. According to Lakoff, the prototype is not defined in relation to the real world or the knowledge of an individual, but in relation to one or various idealized cognitive models. Lakoff (1987: 9–28) defines idealized cognitive models as conventional conceptual representations of the way we perceive and organize reality (encyclopedic knowledge).

Idealized cognitive models are idealized because they are abstract, and do not represent specific instances of a given experience. They are also schematic or simplified because they partially represent what a particular culture knows about a concept. Idealized cognitive models indicate the social expectations about a particular concept within a culture, and even include myth and beliefs in a certain society. Finally, they are cognitive because they can explain cognitive processes such as categorization and reasoning. In fact, according to Lakoff, exemplars not recognized in the idealized cognitive model of a particular culture are considered peripheral in the category.

This model of categorization in Sociocognitive Terminology is based on Rosch's (1978) Prototype Theory, which is the culmination of Wittgenstein's (1953) notion of family resemblance, of anthropological research by Berlin and Kay (1969) on focal colors, and of linguistic research by Labov (1973) on household containers (CUPS, MUGS, etc.). As opposed to the idea that categories are defined by necessary and sufficient criteria, and that membership in them is all-or-nothing (*Classical Theory of Meaning*), Prototype Theory states that many categories lack necessary and sufficient conditions for membership. Instead, they are graded according to their similarity to an ideal member or prototype, which best represents this category. In addition, it is usually the case that there is not a single feature shared by all the members of the category. In other words, categories display family resemblance structure.

According to Prototype Theory, a conceptual map takes the form of a series of concentric circles with concepts placed intuitively either nearer or farther away from the prototypical center. Consequently, category structure is based on degrees of typicality as the pattern for categories or domains with little or no mention of their internal organization, the types of information contained, or the