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The polysemy of prepositions *at*, *beside*, *by*, *near* and *next to*: The horizontal axis of spatial relations

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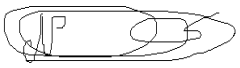

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TABLE OF CONTENTS

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LIST OF TABLES

LIST OF FIGURES

Chapter 1: Introduction

Traditional strategies and procedures used to learn a foreign language include studying the rules of grammar and doing gap-fill exercises, repetition of words, exercise drills, and memorising the irregular verbs and usual expressions of everyday language. However, some uses of prepositions by non-native speakers are questionable, though also intriguing. Traditionally, students are uncertain about their uses during the learning process since the polysemy of prepositions is a challenging topic, and there are various types of senses, from spatial to abstract, by which prepositions may express meaning in different contexts.

As a postgraduate student, I carried out research that dealt with the kind of practice that students need to undertake for a better understanding of the preposition *on*. One group followed a theoretical procedure, and another group an experimental procedure. These questions raise: should this practice be based on learning rules and drills? Should this practice rely on an approach that focuses on a more natural way to learn space relationships by focusing on the nature and contextual uses of prepositions? From a Cognitive Linguistics perspective, and as a continuation of that research, which is also dealt with by other studies of this approach, such as the prepositional polysemy approach developed by Navarro i Ferrando (1998), I shall seek and check the use of other prepositions regarding visual space.

In this research, as there is a variety of prepositions, I intended to take into account the vertical and horizontal axes, for instance, some units expressing the vertical axes (*above, below, over* and *under*) and some units representing the horizontal axes (*at, by, next to, near* and *beside*). First of all, I compared the definitions of these prepositions in some dictionaries, such as Merriam Webster, Cambridge dictionary, Macmillan dictionary and English Oxford dictionary. Although in most of these dictionaries, the definitions and examples given are similar, the most common way of learning the contexts is to read examples and their uses.

When I started to search the bibliographical references about this field, I realised that instead of considering both the horizontal and vertical axes as a broad point of view, only the horizontal axis should be dealt with because of the large variety of prepositions expressing diverse horizontal relations (e.g., the horizontal direction scans 360 degrees). So, I decided to focus on fewer prepositions to clarify their main uses better and give more depth to the research. Therefore, only prepositions of the horizontal axis, namely, *at, beside, by, near,* and *next to,* are considered in this research. I mainly ground my research on previous approaches to related prepositions, but the methodology does not include the same procedure as the earlier studies. The methodology of this research consists in explaining the theory of polysemy and understanding the use of these prepositions regarding the dimensions of function, topology and force dynamics (Navarro i Ferrando, 1998), which are central to the study of physical space, as well as regarding the notion of frame of reference (Levinson, 2004) and image schemas (Johnson, 1987; Lakoff, 1987). Then, these prepositions of the horizontal axis, which

are used in a variety of senses, are analysed as well as the corresponding explanation of semantic parameters illustrating their main uses and senses.

So, the main objective is to clarify the meaning and senses of prepositions in different contexts with the help of a corpus in the English language. An explanation of theory, background knowledge, and the prepositions of the horizontal axis with examples of senses and functions are proposed to solve some questions such as: how does a speaker know which preposition to use, and why is a given preposition used in a particular context?

In this chapter, I clarify the motivation for this work, its aims and scope, the research questions and hypotheses, and the structure of this work including a summary of the remaining chapters.

1.1 Motivation of this work

Some questions may arise at this point: Why are prepositions important and useful? Why have I chosen these prepositions? What is the motivation for doing this research?

Prepositions are important because they are pervasive in linguistic expression, in both formal and informal language. They are words that indicate relations between nouns, verbs, and adjectives to communicate the conceptualisation of spatial relationships in language use. They reveal the positions of animate and inanimate entities, people, objects or animals in a scene. They have several functions and senses depending on the context and the degree of specificity. Therefore, I have chosen these prepositions because, though there is extensive research on some prepositions (*in*, *on* and *at*), there is not enough yet about prepositions of proximal orientation such as *at, beside, by, near* and *next to.* I have always had the curiosity to research prepositions of nearness and distance so that they can be ordered on a scale.

The primary motivation for researching the polysemy of prepositions is to understand the use of language, the different spatial meanings and the senses of prepositions in a new and different approach, including nuances of meaning and semantic motivation that does not appear in dictionaries. This research aims to provide some criteria that can clarify the semantic parameters and obtain a scheme of meaning for the human perception and expression of visual space in language. This approach includes an interpretation of contexts by means of several parameters, such as image schemas, the three semantic dimensions of topology, dynamics and function, the three frames of reference (relative, intrinsic and absolute), the animacy of entities and a dimension of construal (vantage point).

Thus, there are two reasons for developing this research field; I was interested in doing this research about a description of spatial prepositions due to the fact that they are expressions used frequently in communication. Another reason is to know and clarify these prepositions with geometrical concepts and perceptual parameters, in such a way

as to add additional information relating to the use of prepositions because of the complexity involved in clarifying their different uses.

What is the meaning of the term *grammar*? The answer to this question is not only related to a list of rules, but also to an approach to communication between speakers of the same language. Grammar is used to formulate sentences, ask questions, or specify a description. The function of grammar may be to facilitate the giving of instructions (to establish rules to know how to use words and then consider to follow these rules) and to describe language (to understand how language works and occurs in communication for understanding meaning). Therefore, grammar includes rules and encompasses an understanding of meanings in a language.

Hence, grammar and the uses of prepositions are often puzzling but also intriguing at the same time. In relation to knowing the uses of prepositions, the grammatical basis should also be considered in order to understand the spatial relations and functional relations of prepositions in various contexts. Despite the fact that prepositions may seem to be a set of words sharing the same meaning or that they are synonyms of each other, these words are not equivalent. There is a slight difference of meaning that cannot be noticed in most examples by language learners. But using a wide selection of examples, this study will present clear contrasts between their meanings.

1.2 Aims and scope of this work

Traditionally, linguists tended to describe prepositions with functional and positional criteria, but the semantic factors that determine their use have not been considered until recent times. In some cases, it was not observed that a word might have a lot of different meanings. Many linguistic approaches assert that prepositions are regarded as function words rather than meaningful words like nouns, adjectives, verbs and adverbs, all of which are lexical words (i.e., they carry lexical meaning). In standard grammatical analysis, prepositions are regarded as function words rather than lexical words. The function words *near* or *far away from* are some of these words, and this dissertation on polysemy goes against the general assertion that prepositions do not have any lexical meaning. Instead, I claim that there are different and related senses of lexical units (prepositions) in reference to a context (see section 1.3 and 2.3.1).

Spatial Semantics in different languages is one of the most analysed fields in Cognitive Linguistics, in contrast with other theories of language. In general terms of Semantics, there are studies about polysemy, cultural diversity, idiomatic expressions, false friends and diversity in the use of single items. It seems obvious that understanding the mechanism of an abstract sense (a metaphor), the use of senses and the different meanings facilitates learning a language. It is helpful for developing interpretation techniques.

Different approaches to focus this work on prepositions might have been adopted: a perspective for teaching methodology for improving the learning of the English language, a comparison of the English language with the Spanish language (contrastive Linguistics), an acquisitional study comparing groups of children of different ages who learn these concepts, a comparison of three books in the English language from different centuries (diachronic Linguistics), an analysis of one or two different genres of English books from different authors or even from the same author, and an corpus-based analysis.

In this case, this research focuses on the polysemy of prepositions, spatial orientations in literal (concrete) uses based on human perception, excluding idiomatic expressions and metaphorical senses. Concretely, the prepositions of this study are *at*, *beside*, *by*, *near* and *next to*. The central aim of this work, therefore, does not focus on the teaching methodology and the teaching development in the classroom, but the aim is to describe the use of language and the semantic aspects themselves, including a detailed analysis of those aspects in order to make possible for language learners clarify usage in the English language. The study of the use of prepositions in the English language is significant for understanding prepositions in other languages because of the wide variety of uses of prepositions in English. Some applications may be found for teaching by means of procedures and methods, but this point will be implemented in another piece of research.

Grammar textbooks have taken little account of the variety of meanings, the interaction of prepositions with other elements or their uses in different contexts. Hence, the topic of prepositional usage is not an easy one when learning a foreign language as a student, inasmuch as the figurative senses have not been appropriately explained until now. Thus, a division of literal senses and metaphorical (or figurative) senses of prepositions is necessary to describe my analysis. It is assumed that these senses (figurative) have been derived from literal senses cognitively. Thereupon, a big corpus is analysed with one thousand examples of each one of the five prepositions (in total five thousand examples) from the British National Corpus (BNC), where there are different possibilities for doing research and a variety of genres from which to choose (spoken, fiction, magazines, newspapers, academic and so on). In this analysis, I select the lists of fiction books and the examples of newspapers about different sections except for economics and politics issues. These literary genres may be from the subtype of high fantasy, adventures, real stories, theatre plays, comedies and even current affairs.

In reference to the aim of this work, these contexts are appropriate for the analysis of spatial language by illustrating spatial situations and environments and for the comprehension of this imaginary or real world and the spatial perception of the characters' movements in a scene. These written texts (fiction books and newspapers) are more useful than oral communication to make a comparative study of the variation and frequency in the use of these prepositions considering the parameters employed in the analysis.

In the description of polysemy, a prototype model (Lakoff, 1987; Navarro i Ferrando, 1998; Rosch, 1973) has been applied with some senses which are prototypical and others more peripheral. These senses are the product of elaboration or the extension of a prototypical sense and image schema (see section 4.5) that are transformed or extended. Besides, metaphorical and metonymic mappings create new uses of these senses, but these are excluded from our analysis.

Pragmatic and functional aspects of meaning are also incorporated in the explanations of senses. Furthermore, about other aspects of communication, all these aspects of pragmatics and function are abilities, which speakers use to produce utterances, the abilities to frame a situation and create a space. There are also other aspects such as social bounds and relationships (sociolinguistics), discourse organisation (discourse analysis) or situational aspects (pragmatics) that are necessary for the use of language. Still, these aspects are not the object of this analysis.

1.3 Research questions and hypotheses

In this dissertation, I focus on a set of horizontal prepositions, specifically *at, beside, by, near* and *next to.* These prepositions instantiate different senses of meaning such as direction, movement, proximity, distance, contact, among others.

Considering the hypothesis that prepositions do mean senses and that I agree with this approach, a first question from the state of the art (see section 4) may arise to show the validity of this hypothesis:

- How is it possible to affirm that prepositions have meaning?

According to Navarro i Ferrando (1998: 1-2; 22-23), prepositional meanings are found in context, and prepositions have their own lexical meaning contributing to contextual meaning in addition to that of verbs, nouns or adjectives. In the descriptive approach to prepositional semantics (Navarro i Ferrando, 2000), there are two positions and research on the semantics of prepositions falls into one of two main trends or theoretical stances. The first position is that a preposition does not have multiple meanings but a meaning that is a *core sense*, and the second position is that a preposition does have meanings (more than one meaning). Thus, in this dissertation, I also try to explain this viewpoint in a certain way and my agreement with this conception of polysemic meaning (see section 2.3.1).

In a paper about the first uses of prepositions by children, *What can child language tell us about prepositions?* by Morgenstern & Sekali (2009: 272; 283), prepositions are understood to be semantically coloured in that they indicate lexical and spatial value or, by contrast, where they are also understood to be colourless, in that they just indicate a functional value with a lack of semantic meaning. Depending on the use, the same preposition may depict functional or lexical value. For example, the primary value being a lexical value (i.e., *I'm going to London*) or the primary value being functional

expressing a dative case (i.e., *give it to him!*). From an observation point of prepositional analyses by the way children use them, the contrast extrapolated from Morgenstern & Sekali's analysis is that French children tend to use functional prepositions firstly. In opposition, English children tend to use spatial prepositions.

In traditional grammar, Huddleston & Pullum (2002) define prepositions as words that express a relation to another word without considering any added meaning. Although before the 1980s, linguists had not explored the meaning of prepositions, traditional grammar has influenced linguists of the twentieth century to begin this exploration about prepositions. There was a lack of detailed description of these grammatical aspects, namely, the meanings of prepositions and their semantic values.

During the 1980s and 1990s (Evans, 2007), the development of analytical techniques in Cognitive Linguistics moved in the direction of the polysemy of prepositions. In Belgium, Germany and Holland, this new field of research highlighted the inadequacies of the previous system in its inability to clarify the semantic meanings of prepositions. According to the literature, the following authors proposed relevant research about the polysemy of prepositions and their meanings and focused on usage and corpus-based analysis in the 20th century:

- Saussure (2011) mentions that the use of a language is perceived as norms, and in Structuralism times, it would be *langue* (language) with values and meanings.
- Geeraerts (2010) notes that the research of polysemy presented how meaning is classified and described from Structuralism.
- Langacker (1987, 1991) explains the cognitive basis of grammar, the notions of trajector and landmark, and the polysemy of prepositions that indicates proximity and directions between entities.
- Lakoff (1987) sought to formulate a radial network with lexical senses, a prototype and a categorisation.
- Sandra & Rice (1995) classify a network of prepositional meanings with central and peripheral senses.
- Tyler & Evans (2003) explain English prepositions in a spatial sense and determine distinct senses.
- Navarro i Ferrando (1998, 2006a) identifies the prepositions *in, on* and *at* with the three semantic dimensions of topology, dynamics and function, in a conceptual schema.
- Vandeloise (1991) notes the relative function of prepositions comparing English and French prepositions.
- Johansson Falck (2015, 2018) compares examples of the prepositions *in* and *on* with specific senses in a corpus for Swedish speakers who had an advanced level in English.

Regarding the senses of prepositions, some of them are called literal senses, which are based on the word's ordinary meaning, and others are called metaphorical senses or

figurative senses, which are used with more imaginative or abstract meaning than its original one.

After a first question about the meaning of prepositions, other questions may arise to develop the analysis. At the beginning, learning prepositions is, in fact, a way of studying their main uses (concrete senses) before studying metaphorical senses. But referring to how the process can be done and action can be taken to achieve it easily, some questions should be asked, such as:

- How can the uses of prepositions be explained through these three semantic dimensions, topology, dynamics and function (Navarro i Ferrando, 1998; Deane, 1993, 2005)?

- How can the uses of prepositions be explained employing frames of reference (Levinson, 2004) and image schemas (Johnson, 1987; Lakoff, 1987)?

- How can a method be defined to decide between metaphorical or non-metaphorical uses of prepositions (Pragglejaz Group, 2007: 3-4; Steen, 2010: 25-40)?

In order to assess the validity of these questions, the corresponding hypotheses are stated:

- Firstly, it is necessary to interpret the sentence and the meaning of a preposition. Then, it is possible to explain the current uses of one preposition using a list of parameters, such as the reference to these three dimensions, topology, dynamics and function, and considering the most crucial dimensional parameter from a context to understand the scene.

- The uses of prepositions may be explained through frames of reference and image schemas due to the representation of contexts and scenes from a classification of different types.

- The metaphorical extensions or figurative senses, which are not included in this study, are derived by virtue of the literal senses and the functional dimension. The steps will be described in order to divide the metaphorical senses from the concrete senses (see section 4.9).

The benefits and the advantages which can be found in considering the three semantic dimensions and the other parameters such as frames of reference and image schemas are the following:

- The learning process could be regarded as profitable in order to understand the use of prepositions.

- As will be seen from this research, context plays a fundamental part in choosing the appropriate preposition to be used in any given situation. For example, when translating from English into Spanish (e.g., in English, the verb *to arrive at* and in Spanish the verb *llegar a*). The reason is that prepositions have different senses and it is necessary to understand the context in order to know when to use the appropriate preposition. Then, this approach is focused on developing the understanding of the use of prepositions in horizontal directions in a way that makes it easier to understand that usage.

- The point is to distinguish prepositions since some of them seem to have the same meaning, such as synonyms, but they are not the same at all.

- Even though the figurative senses or the metaphorical senses are not viewed in the same manner as the literal senses, the descriptions of the three semantic dimensions of topology, dynamics and function can be applied to give an understanding of these senses. Other parameters can also be applied to their understanding, for example, the three frames of reference (relative, intrinsic and absolute) and the image schemas (see chapter 5).

1.4 Structure of this work

The initial premises for this work are the following:

1) The representation of polysemy in a preposition is seen in the semantic structure within prototypical and peripheral senses.

2) In the polysemy of prepositions, the senses, literal senses and metaphorical senses should be linked. Then, metaphorical or abstract uses should be extracted from senses based on bodily experience through a meaning extension.

3) In order to understand prepositions, firstly, the process is to analyse the concrete or literal senses and, secondly, having understood the concrete uses, the process is to analyse the metaphorical or abstract senses.

4) In a scene, some objects or people that may be a trajector and a landmark are recognised. Then, in order to understand the context, an interpretation of the use of horizontal prepositions is regarded within a set of semantic parameters.

The summary and the main chapters of this work are the following ones:

In chapter 1: An introduction of the principal aims and scope of this research, motivation for doing this research, some research questions and a hypothesis, a summary of this work and the terminology used in this work are introduced.

In chapter 2: A theoretical background is described so that the definitions of semantics and polysemy, the semantics and polysemy of prepositions, an explanation of Cognitive Linguistics and prepositions, the linguistic categorisation and some grammar aspects are described. The three frames of reference and the representation of objects are also detailed, including the location of a thing, a classification of accessibility, a functional description of spatial prepositions, and the semantic structure of prepositions.

In chapter 3: The previous research on the semantics of prepositions is exposed including the focused prepositions of this research. The prepositions are *at, beside, by, near* and *next to.* The representation of horizontal directions, the semantic categories and the spatial senses of these prepositions are described.

In chapter 4: The theoretical framework of this research is exposed, including the three main dimensions and aspects of perception (topological relationships, force-dynamic patterns of interaction, and functional relationships between entities); principles of construal (Langacker, 2008): perspective and temporal dimension; frames of reference (Levinson, 2004); topology (Deane, 2005 and other authors); force dynamics (Talmy, 2000), and image schemas (Johnson, 1987); horizontal orientation (Talmy, 2000); scale of animacy (Feist, 2000); relative function (Vandeloise, 1991) and determining distinct senses (Tyler & Evans, 2003). This dimensional perception and interpretation model is necessary to understand the semantic structure of units.

In chapter 5: Research questions and hypotheses are concerned with the parameters of this study to determine the possible linguistic characteristics of the five prepositions.

In chapter 6: The methodology is presented with materials and procedures used to analyse these prepositions, including the definitions of sense parameters.

In chapter 7: A detailed analysis of the prepositions *at, beside, by, near* and *next to* from excerpts of the BNC is exposed with tables including parameters, the predominant values and their frequency.

In chapters 8 and 9: A discussion is presented to overview the results and the semantic contrast of these prepositions. In the last section, considerations of the main findings are added with some conclusions and results.

Chapter 2: Theoretical background

In this chapter, a theoretical background is presented to overview a general outline of lexical semantics and the polysemy of prepositions. The sections are the definitions of semantics, polysemy, homonymy and monosemy, an explanation of Cognitive Linguistics and prepositions, the terms of the trajector and the landmark, linguistic categorisation, the category of prepositions and prepositional meanings. At this point, I address how these definitions are helpful to determine our viewpoint to define specific meaning.

A linguistic description should deal with detailed information regarding the complexity, the categorisation of prototypes, and the not clearly defined principle of category boundaries. According to Cognitive Grammar, a language is structured with traditional linguistic units such as sentences, phrases and words. A language can be described as its grammar in general use, including the study of meaning which a speaker may acquire (see figure 1). The structure of the semantic content includes both constructional patterns and lexicon.

Additionally, according to traditional grammar (Langacker, 2008: 318-321), there are different levels of specificity in linguistic units such as grammatical or lexical units, in which lexical units are classified into different types of grammatical categories. The lexical units described in this work are in a close proximity to the grammatical category. In this sense, some uses, for example, as prefixes, suffixes or verb-particles (*by-* in *bypass;* phrasal verbs such as *stand by*) are similar to grammatical morphemes (such as *the*; the *-s* of *words*; the *-ed* of *indicated*).

However, the lexical meaning of units is seen as heads of prepositional phrases (a preposition and another word or phrase functioning as a prepositional complement such as *at the end* or *by nature*) and as adverbs. In dictionaries, the traditional description of prepositional units as separate words, even with polysemic distinctions, makes them more similar to *lexical units* than to grammatical units (Langacker, 2008: 218-220).

Nevertheless, linguists usually have not explained why one unit is employed instead of another in a particular context. In some examples of English particles, Navarro i Ferrando (1998) indicates that it is possible to explain why a linguistic unit is used. Its semantic structure explains the different uses of a unit, and therefore, an explanation of its polysemy is necessary. These uses of a unit would give rise to questions about their semantic categorisation. The term *unit* (Langacker, 2008: 38) is considered as symbolic, that is, an assembly of meaning and form (an expression), but not all speakers know the same expressions or set of units. Some speakers could know different specifications of the same unit, but use that unit to refer to various domains. The semantic side of a unit is the semantic structure of that unit, which is also called *predicate* or *semantic category* in Cognitive Grammar (CG).

In Cognitive Linguistics (Koptjevskaja-Tamm, 2015: 473), with regard to the notion of polysemy some points should be understood:

- Seeing meaning or sense of a category (this author suggests the notion of *meaning* for an unrelated way of interpreting and the notion of *sense* for a related way of interpreting).

- Determining the context of a meaning or a sense and having a wide and linguistic knowledge that is hard to be achieved.

- Indicating a prototype and a categorisation with members related to that prototype.

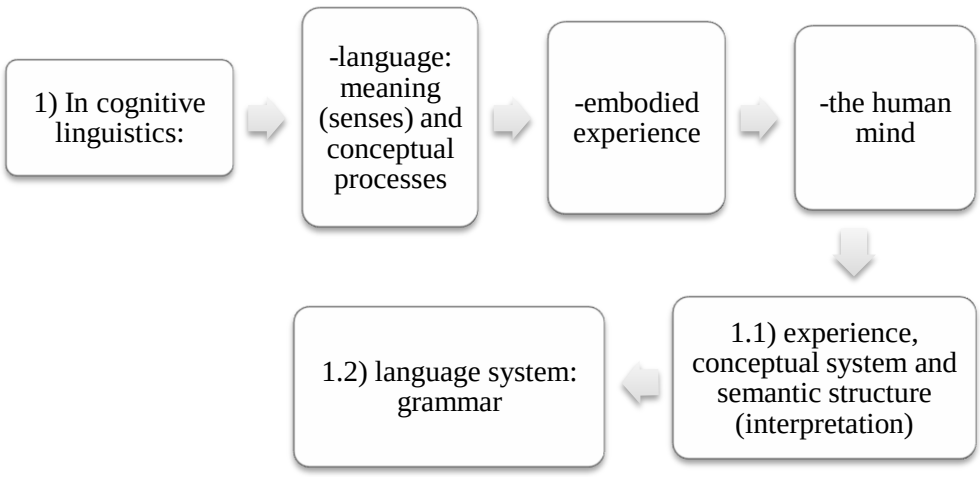
The approach of Cognitive Linguistics and the sub-branch are summarised below (taken from Evans, 2007: 17, 22, 26):

Cognitive Linguistics is an approach to the study of language (meaning, conceptual processes and embodied experience) and the human mind. The two best-developed sub-branches are cognitive semantics and cognitive approaches to grammar.

Cognitive Semantics: the study of the relationship between experience, the conceptual system and the semantic structure encoded by language. Cognitive Semantics includes other theories such as Cognitive approaches to grammar.

Cognitive approaches to grammar: are concerned with modelling the language system (grammar) in ways consistent with generalisation and Cognitive Linguistics.

Figure 1 shows the basic scheme of Cognitive Linguistics (from Evans, 2007: 17, 22, 26):



2.1 Lexical semantics

The evolution of Lexical semantics within the theoretical framework of Linguistics is relevant to understanding our analysis better. According to Geeraerts (2010), Lexical Semantics has evolved through the following stages:

- Historical-philological semantics: historical-philological semantics is the diachronic study applied to lexical semantics that indicated the development of that area of study from 1850 to 1930 approximately. This approach maintains an interest in the meaning and semantic change like generalisation, metaphor or metonymy.

- Structuralist semantics: structuralist semantics dates from 1930 onwards and this study follows the theory of language by de Saussure. It approves relations of meanings to focus on the semantic analysis, including lexical field theory, componential analysis or relational semantics.

- Generativist semantics: some aspects of structuralist semantics were introduced into generativist semantics. Then, generativist semantics introduces semantics as a part of formal grammar. In generative grammar, the understanding within any particular group may vary to make the relevance of an interpretation within this theory and may generate concern about the adequacy.

- Neostructuralist semantics: this approach is based on structuralist ideas like descriptions of semantic structure and specific observation for generativist semantics (linguistic meaning and cognition).

- Cognitive semantics: cognitive semantics is the psychological and cognitive approach to semantics initiated from 1980 onwards. The study of word meaning was developed by innovations including conceptual metaphors, prototype theory or frame semantics. This framework is one of the most effective results of lexical semantics.

Regarding the focus on historical-philological semantics, three stages are necessary to explain the development of lexical semantics in that period. First, the approach of the French linguist Michel Bréal is detailed. Next, the German linguist Hermann Paul developed the approach that spells out the relevance of context and application to explain semantic change. Finally, new perspectives are added onto the evolution of a language and linguistic meaning commented by Bréal and Hermann Paul.

Therefore, three principal features may be commented on with information on historical semantics by Bréal (1897), who influenced the significant methodological ideas about semantics that is denominated as a *historical* discipline. According to Bréal's *Essaie de sémantique* (1897: 1-3), a diachronic orientation of semantics (being the development and evolution of a language through history) is a significant fact in Linguistics:

> *Si l'on se borne aux changements des voyelles et des consonnes, on réduit cette étude aux proportions d'une branche secondaire de l'acoustique et de la physiologie; si l'on se contente d'énumérer les pertes subies par le mécanisme grammatical, on donne l'illusion d'un édifice qui tombe en ruines; si l'on se retranche dans de vagues théories sur l'origine du langage, on ajoute, sans grand*

> *profit, un chapitre à l'histoire des systèmes. [. . .] La linguistique parle à l'homme de lui–même: elle lui montre comment il a construit, comment il a perfectionné, à travers des obstacles de toute nature.*

Thus, the correct understanding of words in context and their meaning requires knowledge of semantic history (Geeraerts, 2010). Geeraerts emphasises the orientation of the study of meaning. In this case, the linguistic meaning is the phenomenon, and the change of meaning results from the processes. Language is connected to categorisation in which human beings make sense of humanity with cognitive categories consisting of meaning. The general mechanisms of semantic change are acquired from the knowledge of the words' history, which establishes patterns of thought in the human mind. These mechanisms are called by Bréal *le lois intellectuelles du langage* - the conceptual laws of language.

The first essential factor that provokes the mechanisms' change into function consists of the needs of the language user's communication. Concerning the second factor, people have to express their thoughts, feelings and mainly to communicate, and therefore, for those reasons, language changes through communication. The third major feature is the orientation of semantics that has methodological consequences of that communication. Considering the theories of the German philosopher Wilhelm Dilthey, the natural sciences likewise study historical processes. That is why the natural and the human sciences concentrate on the methodological level rather than on the subject or topic itself.

Additionally, human sciences try to comprehend the cultural forms of expression in which men explain the experience of life through an emphatic procedure in interpretation. However, the natural sciences tend to note the characteristics of the material world through inflexible laws.

Through the experiential orientation, the historical approach and the expressive intentions of language users, the human sciences and Linguistic Semantics are linked on the basis of the Diltheyan view. Since Linguistic Semantics is a historical discipline, the initial material is composed of texts from stages in the progress of an active language. Here the methodological procedure accordingly is the *interpretation* of those texts. Thereupon changes can be classified and recognised between terms. The initial methodological step is to interpret historical texts in relation to the background of the original context and try to rediscover the author's fundamental intention.

In summary, Bréal identifies historical-philological semantics as the dynamism of language, the cognitive conception of meaning, and an interpretative methodology.

Hermann Paul distinguished between usual and occasional meaning. The usual meaning is shared by the members of a language community, being the semantic representation that would be described in a dictionary and known to all the speakers of that language. Whereas the occasional meaning emphasises the precision that this general concept obtains in a context within a specific utterance. A connection with prepositions is that

each one is likely to have related literal meanings. The tendency is for one to be a *prototypical* meaning that is to be the best example (Lindstromberg, 1996, 2001).

Moreover, the second aspect is the conception of semantics to identify the usual and the occasional meaning with the importance of the context itself in this process. When a word is polysemous, the usual meaning includes a set of related meanings and senses, and the concrete definition of the general sense. The occasional meaning, however, is always a unique reading to select the appropriate interpretation from among the different senses of a word. Regarding these types of occasional meanings, they derive from the usual meaning.

Furthermore, the third annotation is the dialectic relationship between language structure and the use of a language. Since occasional meanings may become usual, they may get an independent status. Thus, ordinary meanings are the basis for the derivation of occasional meanings. The contextualised meanings may turn into habitual meanings, and a clear pattern for a shift from an inverse situation, the occasional, to the usual level is the possibility of interpreting and understanding new meanings separately. For instance, the word *corn* means "wheat" without any particular clue in terms of linguistic or extralinguistic environment, then this sense of "wheat" has become conventional and accepted. For example, there is a metaphor in English (Cambridge Online Dictionary): *separating the wheat from the chaff, namely, separating* the good from the bad.

Thus, Paul develops a theory of semantic change based on semantic use, and this is also pragmatic, having a practical point of view. This theory is the basis of semantic change, which emphasises the usual meaning from the occasional meaning.

According to Verleyen (2006: 823), who presents *Le rapport entre changement sémantique et changement phonique chez Michel Bréal*, Semantics is seen as a branch of Linguistics and still has a value in recent studies. A brief explanation of this notion of a change of meaning is detailed below:

> *De façon générale, Bréal nous a donc légué, en germe, une théorie moderne du changement linguistique, qui, aujourd'hui encore, conserve une grande partie de sa valeur, comme le prouve le fait qu'il est invoqué comme précurseur de théories actuelles comme la sémantique cognitive.*

Bréal and Paul conceive meaning in the view of historical-philological semantics. But other authors also covered this field. Therefore, four lines of research were regarded as per semantics: first, the logical-classificatory approach; second, an alternative conception of aspects of meaning is introduced following Bréal; third, extensions of the contextual view are introduced based on Paul; fourth, an introduction of onomasiological research.

These approaches come both from before and after the studies by Bréal and Paul. The following points are relevant about these approaches (Geeraerts, 2010):

- 1. From the first half of the nineteenth century up to the 1860s, the focus was on identifying patterns of semantic development and classifying those changes. This approach is called logical-classificatory. Words may change their meaning because language users try to formulate something new, and speakers adapt the language to their needs and change it, as pointed out by Bréal. This is dedicated to the identification and classification of changes in the language's lif*e.*

- 2. The second approach was developed by *Von Humboldt,* who introduced a distinction between an outer and an inner linguistic form. The outer form is the phonetic side and the information, whereas the inner form is the semantic form, grammatical or lexical, that distinguishes one language from another. As Breál and Paul pointed out individually, there is a necessity of having the faculties of the user in order to get language developing. Then, a different form of variation that focuses on lexical semantics is the type of thinking and personal abilities of language users.

- The cognitive phenomenon is represented in descriptive terms. For instance, the sense of a phrase for *Christmas tree* is used for a family reunion. This would be a tree decorated with lights and Christmas baubles, situated inside or near the house. However, for the cognitive content, the focal point is the thought of a typical atmosphere, where a family is reunited, a special dinner is prepared, and presents are shared. These terms have regard to the emotional values of words and the concept of connotation, the secondary meaning (values, feelings of a word, associated concepts) and in contrast, the concept of denotation, the explicit meaning, the basic referential meaning. Going beyond the changes of emotive sense, Sperber (1923) claims that emotive structure (metaphor) is a basis of semantic variation.

- 3. The third approach is focused on the dialectic relationship between language structure and the use of language in a contextual view. Meanings are formulated in contexts of the actual language. The notion of context has two focal points. The first one is called socio-semantic, which gives a sociological aspect for interpreting contexts in historical-philological semantics. The second one is the communicative one, which presents a pragmatic interpretation.

- The socio-semantic approach is introduced by Antoine Meillet (1906). The basic idea is that a word is used in a social group, and this word may be distinguished from readings of polysemy or lead to a change of meaning. Paul himself had already centred on linguistic and extralinguistic context factors, the words combined with a target word or the situation in which this word is used. Thus, social contexts contrast with different senses. Referring to an example of Bréal, the word *operation* is used in some social contexts: it refers to a calculation for a mathematician, it relates to medical surgery for a doctor, or it

applies to the functioning of a piece of machinery for a worker. From a pragmatic point of view, the essential idea is that a context needs to be seen in a communicative aspect. Meanings are dynamic for the function of a social context and the function of the communicative interaction among users. Although when the communication perspective is taken, the lack of clarity or the vagueness is often real concerning the communicative aspect itself, something that needs to be overcome.

- 4. The fourth line is focused on the onomasiological perspective in Lexicology. The distinction between the terms of semasiology and onomasiology is basically *meaning*. The first term starts from the expression and looks at its meanings. The second term is *naming*, which starts from the meaning and looks at the different expressions of a thing. The term lexicogenesis itself includes the mechanisms for introducing new pairs of word forms and word meanings. Thus, these are the traditional mechanisms, in other words, like word formation, word creation (creation of new roots), truncation, borrowing, blending ellipsis, or folk etymology which introduces new items into the onomasiological list and inventory of a language.

- Moreover, the onomasiological change involves a general variation in the specialised vocabulary, not just variations of a word meaning. But essentially, the semasiological extension of the sort of meanings for a word in current use is itself one of the significant mechanisms of this change. This is one of the mechanisms in which a concept is used, which connects to a lexical expression. Thus, the basic idea is that the study of words, whether historical, etymological or simply with a variation, requires the study of the objects suggested by those words.

- The fundamental perspective is not so much as the question: what do words mean? But, how are things named and classified through language? At the same time, a particularly onomasiological tradition appeared in the boundary of the appropriated semasiological orientation of historical-philological semantics, *the Wörter und Sachen* (words and objects) movement launched by Rudolf Meringer (1909) and Hugo Schuchardt (1912).

- Although the study of abstract concepts is not omitted, the insistence in *the Wörter und Sachen* approach was inclined to centre almost entirely on concrete objects, either natural varieties like animals, body parts, plants, or ancient objects like tools, and all other aspects of the material culture of a specified language community or a historical era. For the purpose of studying the language of an agricultural social group, for instance, adequate knowledge is required of its farming techniques, customs, natural environment, or social organisation. This entire approach has, in fact, an effective cultural orientation, which is linked with archaeological and historical planning.

To summarise the present section, four theoretical positions have been introduced that add nuances and depart from the standpoint associated with the work of Bréal and Paul. The first group, which mostly organises an older position than Bréal's and Paul's on the chronological line of organisation, is related to the logical classification of changes in meaning. The second group presents variations on the position of Bréal and Paul. Here, those scholars who accentuated the role of non-conceptual and emotive forms of meaning are mentioned in the improvement of vocabulary. In the third group, approval encapsulates alternative ways of filling in the aspects of context for a standard position: either in a sociological trend, as in the French socio-semantic progression initiated by Meillet (1906), or in a communicative and pragmatic trend. Finally, the distinction between a semasiological and an onomasiological perspective is described as represented by *Wörter und Sachen* (words and objects) movement below in table 1:

Descriptive history of lexical semantics:	**semasiology**	**onomasiology**
Investigating qualitative structure: elements and relations	Historical-philological semantics Senses and semantic links among senses (metaphor, metonymy)	(Neo)structuralist semantics Semantic relations among lexical items (fields, taxonomies, lexical relations)
Investigating use and its quantitative effects: salience and fuzziness	Cognitive semantics Prototype effects within senses polysemous items	Cognitive semantics Salience effects between categories, pragmatic onomasiology

Table 1: Description of lexical semantics (Source: Geeraerts, 2010: 281)

Some questions may arise: what does each approach contribute to the notion of *meaning of a word*? What does each approach tell us about prepositional meaning? These approaches explain the evolution, classification, and language variations, including prepositions or nouns (in general words, meanings and other senses such as metaphors) from 1850 to 1900. In a qualitative structure, having senses and semantic relations, and in a quantitative structure, having a prototype in polysemy and salience between categories. This aspect of meanings and words evolution is essential to an understanding of the field of Semantics, and especially, the use of words and their functional value.

2.1.1 Perception and understanding

Merleau-Ponty (2013: xiv-xxiv) describes word perception as a bodily experience concerning the world, not subjective or objective. The two primary aspects of perception are relative: the experience in passivity and the skills of the body. Sensory and motor skills are included. Perception may be both active and passive in situational or practical experiences.

A question is bound to arise: do concepts related to perception also include body concepts? A body is a perceiver of the embedded world around it, adding a location in space, time and a figure on the ground. A new term of experience related to the body is perception. The domain of perception is included within the domain of knowledge. The perception precedes our knowledge of speaking, finding it in thought, in speech and within a language.

Merleau-Ponty's *Phenomenology of perception* (2013: xxxi) pertains to a list from classical texts written in the twentieth century. Several dimensions of experience cannot be separated from our bodies. Since the experience of perceiving things indicates the existence of a body and things in a location and the process by which an entity interprets information.

Concerning human understanding, Locke (1847: 2-4) notes that understanding means a perception of things or objects. In obtaining notions of things, some measurements and knowledge may be seen in assertion and confidence. The limit between opinion and knowledge should be examined in a process: firstly, an examination of notions and ideas, and then, the understanding is present with notions and ideas. Secondly, an examination of knowledge is shown by the indication of notions and ideas. Thirdly, an examination of nature and reason is shown by true propositions.

The capacities of reason and raising questions for understanding and distinguishing perceptions are highlighted. Understanding a concept may extend the development of an opinion and content. The discoveries and the explorations ought to reach new knowledge and faculties for achieving advantages and goals in the acquired understanding of a field.

In addition, Locke (1847: 8-10) proposes that innate principles lie in our understanding of concepts, as some linguists suggested. However, the suggestion of these principles is contradictory due to the idea that certitude may have been attained with the acquired knowledge without these innate principles. Some reasons why Locke may be incorrect about these natural principles are: the knowledge of concepts when people argue with thoughtful and practical arguments, a universal consent and agreement is not innate, or using the propositions *what is, is* and *it is impossible for the same thing to be, and not to be* may not be a universal assent for all people. Thus, when the notions are not assented to or perceived, they are not innate. By the use of reason, the notions may be assented to in order to show knowledge.

2.2 Polysemy

The term polysemy is traditionally limited to word meaning, which is lexical meaning. For example, the word *body* has different meanings, the human body, the primary or central part of something, the trunk of the human body or a body of academic work. Usually, homonymy is distinguished from polysemy. Since polysemy is a linguistic unit that presents multiple and related meanings, cognitive linguists, therefore, view polysemy as not restrained to word meaning. Polysemy is a necessary feature of human language and a key to distinct words in general terms, although some features are held in common in lexical, syntactic or morphological organisation (Klein & Murphy, 2001).

A term related to polysemy is lexicography (Geeraerts, 2010). The term lexicography refers to elaborating dictionaries, including different words, meanings, examples, and explanations. Some questions may arise: where does lexical semantics find its content? The starting preparation faces a task following consistent patterns of semantic discipline, and it comes supplied with a set of descriptive concepts such as rhetorical figures of speech.

Though, what are the characteristics for the basis of this content? Where do examples of words come from? One source of these examples is a philological examination of older texts, particularly, classical philology. Because the interpretation of Greek, Latin, and Hebrew texts is usually not directly obvious, learners of classical languages came across many interesting instances of polysemy and semantic change. It is not an accident, from this view, that many of the earliest linguists on semantic change were traditional philologists (philologists were the primary investigators of the polysemy and semantic changes).

In the nineteenth century, an interest in the older written texts of modern languages increased. Therefore, more cases came within the context of medieval and Renaissance education.

While the first printed dictionaries were bilingual or multilingual dictionaries for translation, at that moment began an interest in dictionaries based on a unique language (Geeraerts, 2010: 7). The *Accademia della Crusca* in Florence printed its *Vocabolario degli Accademici della Crusca* in 1612, a monolingual dictionary of modern Italian, exemplified by quotations from literary authors. This would give support as a model and an inspiration for the compilation of similar dictionaries of other European languages.

The Académie française, for instance, in 1635 started a dictionary project and published the first complete version of the *Dictionnaire de l'Académie française,* in 1694. The next one was Samuel Johnson's Dictionary which came out in 1755. In the nineteenth century, such reference provided lexical meaning and definitions with the advantage of examples of polysemy in lexical items. Thus, items were highlighted as having many meanings, whose intrinsic relationship can be pictured in terms of metaphor, metonymy, and other extensions of meaning.

Later, a new and descriptive dictionary acceded to the scene of the nineteenth century, a historical dictionary that intended to show the development of the language from its initial origins to the present day. An example is the *Oxford English Dictionary*[1] by James Murray et al. (1884, 1989). The historical dictionary proposes that scientific etymology derived from the same research project as diachronic lexical semantics: an interest in correctly describing the historical development of meanings and words. Therefore, the interest in the semantic evolution of terms and the aim towards a scientific etymology is seen.

Thus, lexical semantics originated as a linguistic discipline. Lexicography and textual philology provided an experimental basis of descriptive lexicological data, and the tradition of a set of terms and concepts in the beginning of the lexicographical development.

Concerning the level of patterns for classification in Semantics, the following significant elements would add to make up accounts of semantic change; briefly, these are factors that lead to the differences of classification (Geeraerts, 2010). The main reason is that the various classifications pay different attention to the groups of approaches about the changes of meaning commented on *2.1. Lexical semantics*. For instance, while the first group (the approach of logical-classificatory) is included in most classifications, the other groups (the approach of the aspects of meaning, the approach of the language in a contextual view and the approach of onomasiological perspective) may be presented partially, or not at all.

Moreover, a second reason for variation among the classifications of words is differences in opinion about the accurate definition of specific elements. The word *synecdoche*, for instance, may be open to different interpretations, and may appear in distinct places in the classificatory schemas. In the classification of traditional rhetoric about figures of speech in the use of language, the word *synecdoche* refers to part-whole relations, which is often seen as a specific type of metonymy.

Darmesteter (quoted in Geeraerts, 2010: 31) also notes these part-whole relations on a metalinguistic aspect. For instance, the two senses of the word *cat* present a part-whole relationship: the domesticated, small and furry *Felis catus* is an element of the main category *Felis*, which involves tigers, lions, leopards, and others following as the domesticated animal (the cat). On the contrary, the meaning *Felis* is an element of the meaning as *Felis catus*. When this expansion of part-whole relations is recognised, examples of generalisation and specialisation appear in a classification as examples of synecdoche.

The third reason for variation involves the classification of the depth of schemas. In terms of listing subtypes of the main categories, some classifications are constrained to

[1] Reference: Murray, J. A. H. (1884). *A New English Dictionary on Historical Principles*. Oxford: Clarendon Press.

examples of the basic types only. In contrast, the more elaborate expositions present subclassifications, which may differ from one another. For example, an inventory of metonymical patterns is one of these sub-classifications. The subclassification of types of metonymy is often based on identifying the target and source concepts involved. Thus, the bottle example shows the name of a container (source) being used for its content (target).

Regarding semantic change, other general types of metonymy are the following (Geeraerts, 2010: 32):

- A spatial place for what is discovered there (*the whole theatre was in tears*);

- A duration of time for what happened in that period, for the people that existed then, or for what originates from that period (*the nineteenth century was history-minded*);

- A substance for the product which is made from it (*cork*);

- An action or incident for its results (when the *blow* you have experienced hurts, it is not the action of your enemy that is hurtful, but the physical effects that it has on your body);

- A quality for the essence that possesses a characteristic (*majesty* does not refer only to royal status, but also to the sovereign);

- Part for whole (*hired hand*). These associations can often operate in the other direction. For instance, *to fill up the car,* indicates a type of whole for part.

Deane (2005: 235-282) proposes a model of polysemy postulating prototypical meanings for prepositions in a fundamental domain. Thus, Deane distinguishes three types of polysemy:

- *Allosemy* (an *arm* as a normal biological arm or an *arm* as a prosthetic) appears when a coherent meaning changes in context.

- *Regular polysemy* (the metonymy which supports the *sail* of a ship) appears when a word acquires a distinct sense.

- *Lexical polysemy* (*crown* as a royal headgear and *crown* as a royal government) appears when distinct lexical items are related in meaning. Most of the observed uses of the preposition *over* can be considered by convenience rules with sets of images to present semantic interpretations.

2.2.1 Is it a sense or just a use?

Concerning the terms used in polysemy, Tyler & Evans (2003: 45-59) propose an explanation of senses in semantic networks. For example, the explanation of the terms:

the distinctions, the earliest attested use, the frequency of use, the predominance sense, the primary sense and the prototype, among others. When a new meaning is identified in a context, a question may arise from this semantic field: is it a sense or just a use in this field?

In my view, these two terms (sense and use) refer to the meaning and the use of a word. Linguists use both terms. What these terms mean may be asked due to the criterion of relationship from one spatial relation to another, one that gives form in a contrast interpretation. It depends on what the author wants to explain in a semantic network from a particular context.

Tyler & Evans approach the distinction between senses and uses (2003: 229). However, the interpretation of some aspects of meaning is not detailed in a language. Therefore, many aspects of meaning may not be considered, for example, the non-linguistic aspects of pragmatics, comprehensive knowledge or conclusions that are usually determined in the interpretation procedure.

Concerning English prepositions, Tyler & Evans (2003) employ the term *sense* in phrases such as *a distinct sense, the primary sense, the sense of a TR being situated in a more elevated position than the LM, the earliest attested sense, or priority sense*. Also, the specific types of senses, such as temporal sense, location sense, path sense, distance sense, cause sense, control sense, and others. The term *sense* (Taylor, 2005: 103) is an alternative to the term *meaning.* There is no distinct study to employ one term or another. The authors refer to the term *use* in phrases such as *the frequency of use, the earliest attested use, usage events, meaning extension is usage based and pragmatic in nature.*

According to the Cambridge Online Dictionary, the word *use* (noun) is defined as follows:

- *The purpose for which something may be used.*
  (e.g., can you find a use for this box?).

- *One of the meanings of a word, or the way that a particular word is used.*
  (e.g., can you list all the uses of the word 'point'?).

According to the Cambridge Online Dictionary, the word *sense* (noun) is defined as follows:

- *One of the five natural abilities of sight, hearing, touch, smell and taste.*
  (e.g., I have very poor sense of smell).

- *The meaning of a word, phrase or sentence.*

Then, the meaning of *use* refers to a utility of a word, a purpose for something and in general terms, the way of using a word in a context. For example, the frequency of use, the earliest use. The meaning of *sense* refers to the meaning of a word, such as a

preposition. In the polysemy of prepositions, the term *sense* is commonly used for explaining a location, a control, a path, a cause, a proximity or a distance (such as in a distance sense, a cause sense). For example, the use of the correct preposition is very convenient in the sense that it provides word meaning in a specific context. The use of the library is very convenient to the students because they can research and study.

2.3 Polysemy, homonymy and monosemy

Considering that polysemy is a central topic for this research, the main contrast between polysemy and homonymy is examined in this section. Why is polysemy relevant? In this study, the term *polysemy* in relation to prepositions describes the nuances expressed by the meanings of a preposition. According to the English Oxford Online Dictionary definition, polysemy is defined as *the coexistence of many possible meanings for a word or phrase*. While on the contrary, homonymy is defined as *each of two or more words having the same spelling or pronunciation but different meanings and origins.*

Some examples of homonymy from the English Oxford Online Dictionary are listed below. The first definition of pole: *a long, slender, rounded piece of wood or metal, typically used with one end placed in the ground as a support for something.* One phrase, for example, is *a tent pole.*

And the second definition of pole: *either of the two locations (North Pole or South Pole) on the earth's surface (or of a celestial object) are the northern and southern ends of the axis of rotation*.

Some examples of the notion polysemy (the adjectives *polysemous* and *polysemic* are synonyms) from the Cambridge Online Dictionary are:

- *A highly polysemous word such as 'play'.*

- *The term 'right' is polysemic and ambiguous.*

Some authors (Brugman & Lakoff, 1988; Janssen, 2003) have commented on the distinction between polysemy and homonymy in order to solve lexical ambiguity. Ambiguity of lexical meaning falls within the category of polysemy. The term polysemy refers to a lexical entry related to different meanings or senses so that these meanings are related to each other. The term homonymy refers to a unique lexical entry with more than one meaning, being these meanings unrelated.

According to Lyons (1977), the question for descriptive semantics is, therefore, the problem of drawing an accurate distinction between **polysemy** and **homonymy**. There are two possible ways to develop an answer to this question of the meaning of homonymy. One of them is to comprehend homonymy by associating an individual lexeme with each distinctive meaning ($mouth_1$, $mouth_2$ or $mouth_3$). The second one is to define the lexeme by means of its connected forms and syntactic function.

When the first approach is adopted, the process will end up with more lexical items than in a language dictionary (Lyons, 1977). For example, there are three senses associated with the lexeme *mouth*, and then three distinct lexemes appear in a list with coded information. However, the distinctive features in senses can be amplified. Here, the word *mouth* has different meanings. What are the senses and the meanings of *the mouth of a river*, *the mouth of the tunnel* or *the mouth of the jar*?

As for asking about the criteria that linguists and lexicographers apply to decide which senses appear in a dictionary, one criterion is explicit in the etymological information of dictionaries. The historical derivation of words is the area of study for a lexicographer. A criterion is taken to develop the information from different lexemes in the earliest stage of a language.

For instance, the word ear_1 means the organ of hearing, and ear_2 means the part of a cereal plant as wheat (Lyons, 1977). Then, these words are considered homonymous lexemes by etymological information because these words derived from Old English forms are different, and the forms of these two lexemes are combined in Middle English.

Considering the history of words, the etymological information is not always certain. First, many words which have been written in manuscripts hundreds of years ago are uncertain as to their meaning. Second, sometimes the meaning of a word is unclear in relation to studying its origins or the etymological relationship.

For instance, the word *port* means harbour and derives from the Latin word *portus*. Then, it is also related to the word *ford* in modern English. Another meaning of *port* is derived from the name of the city in Portugal and from where that kind of wine is produced, although the name of this city Oporto originates from an expression *oporto* in Portuguese, and the meaning of it is harbour. This Portuguese word also comes from the same Latin lexeme as the English word *port*. Therefore, these meanings are related to each other, and it depends on the confirmation of the history of words as to how to interpret them. There are not two lexemes that can be seen as homonymous when they are members of distinct parts of speech. In terms of classification, it is assumed that a lexical unit, as a word, will be identified utilising its origins.

At this point, the different lexemes of verbs and nouns are classified, and they are observed as the same lexeme in standard dictionaries (Lyons, 1977). In doing so, as an example the verb $realise_1$ (*he realised his assets*) is distinguished from $realise_2$ (*he realised that he was mistaken*). This question (*he realised his mistake?)* is more related to the second example of this verb. Thus, it may be designated with $realised_2$ within an analysis of English.

The scope is, then, an absolute homonymy defined here, as it is associated with an evident syntactic analysis of the language system since the notion of a syntactic similitude is itself relative, implicitly or explicitly, to a certain set of patterns. However,

in an extensive sub-classification of lexemes, there are not two precise lexemes equivalent syntactically.

In the traditional practice of lexicography, a classification of lexemes is mainly carried out according to the parts of speech to which they pertain. When L_i and L_j are alike, and both are nouns, verbs or adjectives, these words would be controlled within the same lexical reference in the case where these words are not marked on semantic or etymological grounds as homonyms.

Therefore, the importance of identifying the kinds of partial homonymy is basically that it tends to cause ambiguity in some contexts. Homonymy presents ambiguity in sentences in both lexical and grammatical terms. On the other hand, polysemy is considered as absolute homonymy and when its existence is noticed, creates lexical ambiguities only (no other kinds of ambiguities).

As for meanings, another relevant term is monosemy. According to the English Oxford Online Dictionary, the definition of monosemy is the following: "The property of having only one meaning (e.g., these words concern the distinction between polysemy and homonymy, and between polysemy and monosemy)".

For Taylor (2005: 102-107), in the study of word meaning the categories of monocentric and polycentric are equivalent to the terms monosemy and polysemy. The monosemous unit corresponds to a unique sense[2], whereas polysemy corresponds to several senses, two or more senses related to a unique form.

For example, the term *bird* is considered monosemy due to the unique meaning, although diverse creatures can be in this category, such as penguins or robins. The term *school* is deemed to be be polysemy due to the different and related senses, such as a school for educating children, a school at the university or a school of medicine. The term *pig* is also considered polysemy due to the related and different senses and may cause ambiguity, such as the animal or a person who is in the habit of eating in a vulgar or gluttonous manner.

In some cases, there is a difficulty and an ambiguity in deciding whether some examples of senses are from the same category of sense, in which one is the central sense or are other and different senses. A proposition to distinguish monosemy from polysemy may be highlighted by the question of understanding ambiguity from vagueness. An example of polysemy may be ambiguous, and an example of monosemy may be vague.

For example, the term *bird,* as an example of monosemy, is vague, which means inexplicit because the kind of bird is not mentioned. As an example of polysemy, the term pig is ambiguous and may be referred to in one or another sense.

[2] The term *sense* (Taylor, 2005:103) is an alternative to the term *meaning.* There is not a distinct theory in order to use one term or another.

According to Taylor (2005: 104-105), there are three ways of distinguishing ambiguity from vagueness:

1. When more than one meaning is identified, the sentence is ambiguous. Thus, there is a possibility of affirming one of the meanings and denying the other meaning. For example, *there is a pig in the house*. One can affirm *pig* as a person and deny it being a farm animal because of the context. However, in the example, *there is a bird on the lawn*, one could not affirm or deny the type of bird (robin or starling).

2. In the second analysis, there is a coordination of the distinct senses to convert them into a unique sentence (Cruse, 1986: 13). For example, *Arthur and his driving license expired last Thursday.* Here, this sentence proposes that the verb *to expire* means two distinct senses: *Arthur expired last Thursday; his driving license also expired.*

3. In the third analysis, there is an interpretation of a sense referring to the previous information with the anaphoric expression *do so too*. For example, *I saw a bird in the garden, and so did Jane. I don't want a pig in the house, and neither does Jane.* Then, the term *bird* is vague because the subject did not say the type of bird. The term *pig* is ambiguous because the speaker does not state specifically whether the sense is that of a farm animal or the sense of a person.

Moreover, a second comparison concerns the notions of polysemy and homonymy (Taylor, 2005: 106-107). The notion of homonymy refers to meanings which are unrelated and are attached to an identical phonological form. For instance, the word *pupil* which has two meanings, a student or the iris from the organ of sight. Here, there is no relation in these perceived concepts so that these are examples of homonymy.

A question may arise from this context of polysemy: does polysemy need a grammatical function in regard to the distinct senses?

Accordingly, the distinct meanings are connected with parts of speech and grammatical uses. Although, the two senses of *drink*, for instance, (the noun and the verb) are not examples of polysemy. These two senses are related, and however, in terms of syntactical structures, they are two distinct words. Thus, polysemy is identified with a unique syntactic category.

Kokorniak (2007: 35) distinguishes between monosemy, homonymy and polysemy. In the monosemy approach, lexical items have a unique usage and are adjusted in a context. Comparing to a prism that is a form having faces, a preposition may also show these semantic colours by light showing the variations of meaning (Rice, 1992: 91). Nevertheless, this monosemy approach has been rejected by linguists due to the fact that one usage should not contain all features of semantics even though these features are dependent on context.

In the homonymy approach, Kokorniak (2007: 35) claims that this approach has also been rejected due to not having related meanings in the semantic network of senses. In the polysemy approach (Rice, 1992; Sandra & Rice, 1995; Tyler & Evans, 2003; Kokorniak, 2007), distinct and canonical meanings are specified to each preposition. The effect of interpretation is that context may change the meanings. This approach depicts that, for example, the preposition *at* presents distinct meanings that are related to one another.

In summary, the descriptions of polysemy, homonymy and monosemy are detailed below:

Polysemy:

- *The coexistence of many possible meanings for a word or phrase* (the English Oxford Online Dictionary).

- A lexical entry related to different meanings or senses and these meanings are related to each other (Brugman & Lakoff, 1988; Janssen, 2003).

- Polysemy indicates several senses, two or more senses related to a unique form (Taylor, 2005). An example of polysemy may be ambiguous. As an example of polysemy, the term pig is ambiguous and may be referred to in one or another sense (the farm animal or a person). Polysemy is identified with a unique syntactic category.

- In the polysemy approach (Rice, 1992; Sandra & Rice, 1995; Tyler & Evans, 2003; Kokorniak, 2007), canonical meanings are indicated to each preposition. The context may change the meanings in the act of interpretation. This approach depicts that, for example, the preposition *at* presents distinct meanings that are related to each other.

Homonymy:

- *Each of two or more words having the same spelling or pronunciation but different meanings and origins* (the English Oxford Online Dictionary).

- A unique lexical entry with more than one meaning and these meanings are unrelated (Brugman & Lakoff, 1988; Janssen, 2003).

- The two ways to understand the meaning of homonymy, in the analysis of language is (Lyons, 1977): 1.To analyse homonymy by associating an individual lexeme with each distinctive meaning (e.g., $mouth_1$, $mouth_2$ or $mouth_3$). 2. To define the lexeme by means of its connected forms and syntactic function.

- The notion of homonymy refers to unrelated meanings attached to an identical phonological form (Taylor, 2005). For instance, the word *pupil* refers to two meanings, a student or the iris from the organ of sight. Here, there is no relation in these perceived concepts, so that these are examples of homonymy.

- In the homonymy approach, Kokorniak (2007: 35) claims that this approach has also been rejected due to not having related meanings in the semantic network of senses.

Monosemy:

- According to the English Oxford Online Dictionary, the definition of monosemy is: *the property of having only one meaning* (*e.g., these concern the distinction between polysemy and homonymy, and between polysemy and monosemy).*

- The monosemous unit corresponds to a unique sense (Taylor, 2005). An example of monosemy may be vague. For example, the term *bird,* as an example of monosemy, is vague, and that means inexplicit or is not clearly expressed due to the kind of bird not being mentioned.

- In the monosemy approach (Kokorniak, 2007: 35), there are lexical items that have a single usage covering other usages so that these lexical items adjust in a context. Nevertheless, this monosemy approach has been rejected due to the fact that one usage should not contain all these semantic features, even though these features are dependent on context.

2.3.1 The linguistic relevance of polysemy and prepositions

Bréal (1897: 9-10) notes the law that explains some modifications that occur by using a language. The grammar of a language tends to become simplified and more accessible. Then, this simplification is the *law* of grammar in a language, including modifications or changes of words:

> *Si tous les changements qui se font dans le gouvernement et les habitudes d'un peuple, se font dans le sens de la centralisation, nous disons que la centralisation est la loi du gouvernement et des habitudes de ce peuple. Si la littérature et les arts d'une époque se distinguent par des qualités d'ordre et la mesure, nous disons que l'ordre et la mesure sont la loi des arts et de la littérature à cette époque. De même, si la grammaire d'une langue tend d'une façon constante à se simplifier, nous pouvons dire que la simplification est la loi de la grammaire de cette langue. Et, pour arriver à notre sujet, si certaines modifications de la pensée, exprimées d'abord par tous les mots, sont peu à peu réservées pour un petit nombre de mots, ou même pour un seul mot, qui assume la fonction pour lui seul, nous disons que la spécialité est la loi qui a présidé à ces changements.*

The notion *polysemy* is obtained from the Greek prefix *poly-*, which means *many,* and the word *sem,* which means *sense* or *meaning*. Thus, the word itself refers to one linguistic form with different and related meanings. A frequent example would be the word *school* in English. This word can be used as an institution (*Brooklyn School is a good school*), or as the building (*The roof of the school needs to be painted*) (Cuyckens & Zawada, 2001: x).

Polysemy has essentially become the main area of study within Cognitive Linguistics. At this point, the issues to be highlighted are: the field of study focused on polysemy in twentieth-century Linguistic Semantics, and particularly in Cognitive Linguistics in the late nineties and at the end of the twentieth century (Cuyckens & Zawada, 2001).

Cognitive Linguistics developed in the eighties with a focus on the study of language and mind, within the association called *International Cognitive Linguistics Association,* at some conferences, issuing the journal called Cognitive Linguistics and a range of reference texts and textbooks. Ibarretxe-Antuñano & Valenzuela (2012: 24) say Cognitive Linguistics is:

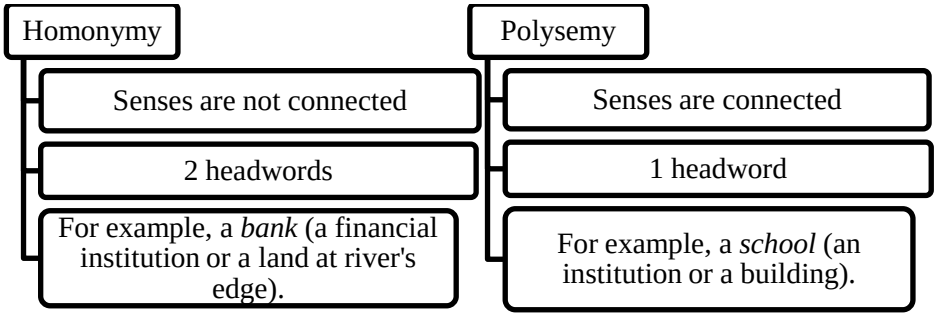
> *Una corriente o un movimiento lingüístico: una suma de teorías que tratan distintos aspectos del lenguaje, cada una con sus objetivos ligeramente distintos, pero que comparten unos supuestos de base sobre el funcionamiento de la lengua [...] Todas las teorías que subsumen dentro de la Lingüística Cognitiva tienden a rechazar el innatismo y el modularismo e intentan encontrar explicaciones de corte funcional en las que el componente semántico-pragmático figura de manera prominente.*

Moreover, the distinction between polysemy and homonymy is essential. Homonymy corresponds with the semantic meaning where the same linguistic form indicates two separate and unrelated words, each one with its own significance (see figure 2). An example of homonymy is the word *bank.* The meanings of a financial institution or land at the river's edge are unrelated (*I deposited the cheque in the bank,* and *the trees on the river bank are dying*).

Thus, this distinction of lexical items, whether being a case of polysemy or homonymy, has been relevant for writing dictionaries. These decisions are necessary when considering the headwords and the number of entries in dictionaries. The various senses of a polysemic word are entered under one headword, whereas homonyms are entered under two distinct entries. This criterion was already used in Linguistic Semantics of the nineteenth century.

In Cognitive Linguistics, a word with a variety of senses regarding polysemy is seen as a category in which the senses of this concept are connected to each other by way of general and cognitive principles (metaphor, metonymy, specialisation, generalisation or image-schema changes). Then, a sense of a concept may be seen as more marked than the others, and these categories are regarded in the structure as radial networks (Cuyckens & Zawada, 2001: xiv).

Figure 2. The distinction of polysemy and homonymy in dictionaries.



For some time now, an interest in prepositions has gradually developed (Zelinsky-Wibbelt, 1993). Natural language processing can be assisted from the understanding of theoretical Linguistics, considering machine translation and image interpretation. Certain techniques for interpreting the authentic event can be examined by looking into the kind of information that prepositions encrypt.

Some linguistic theories develop by applying different techniques for comprehending circumstances and states. Among the most relevant is the conceptual technique of extracting and obtaining information, which would process and keep natural abilities in the human mind. In the information processing system, as in the human mind, the information becomes reduced through those aspects of habitual experience that are illustrated as essential in a particular situation and from the speaker's perspective.

Hence, this abstraction of information with prepositions can be regarded clearly: most prepositions represent spatial states in their prototypical meaning, including aspects of the physical environment. In fact, among several prepositions or several senses of a preposition, the selection depends on the probability of pointing to a degree of specificity (Zelinsky-Wibbelt, 1993).

Reasonably, semantics and pragmatics are related in Linguistics. This point remains valid for semantic development to make changes in the meaning of words. In accordance with the semantics framework, speakers categorise the recognised information into focus, foreground and background. In different expressions and different languages, this framework regards some contrasting concepts for categorisation.

The subjective nature of linguistic meaning itself does not consider a complete discordance between speakers of a language. This framework, on which linguistic traditions are based, constantly conducts an agreement. The relevant point is that a natural language can be interpreted when the structures of a context are explored, and then by considering how meaning is appropriate. This point suggests the possibility of a semantic clarification. In other words, when one defines a language from a human

perspective, one can interpret what a linguistic expression refers to (Zelinsky-Wibbelt, 1993: 4).

The central point that prepositions have achieved within the framework of Cognitive Grammar is that concepts are mental experiences based on physical experience in a spatial surrounding.

Prepositions form a lexical category and are commonly polysemous. Not only are trajector and landmark established in different parameters of boundaries, dimensions or shapes, but also metaphor and metonymy expressions established into abstract domains. Then, a number of polysemes and abstract expressions are formed for the same relational interpretation.

Hence, linguistic accuracy appears in given situational contexts, which propose the requisites for the utility of a lexical unit in a concrete meaning. This affirmation provides a division between two different elements of meaning:

- A meaning that is supported in a lexical unit.

- A meaning that is suggested and specialised by a particular use in a context.

In addition, the matter of cross-language variation and equivalence with the translation of prepositions is laid out by Zelinsky (Zelinsky-Wibbelt, 1993: 20). In using a language and in concrete translation, a semantic model needs to be restricted to interpret and create the patterns of use in diverse languages. A concept of mental space is given with pragmatic features, respecting the function of entities in the conceptualised situation.

Nevertheless, some readers may refute the idea that a preposition may have up to a dozen assigned senses. Such polysemy might be contained in general meanings, of which specific meanings are variants in a context (Taylor, 1993). As Geeraerts (2010) has argued, the two approaches (a focal point in general meanings and another focal point in highly specific meanings) are interconnected.

Indeed, Langacker's *network model* of category organisation also adds both aspects to complement each other. Thus, there are two kinds of relation between the senses of a linguistic structure: the relations of elaboration (these elaborate very specifically, more abstract and schematic meaning) and the relations of extension (specific meanings are modified in the extended meaning).

Prepositions connote a relation between two or more participants. This relation is asymmetrical, in that one participant is added for the foreground, while the others are selected for background or a reference point (Taylor, 1993: 155-166). Taylor makes a broad distinction between three categories of similarity presented by prepositions: place, goal, and path. In this case, objects do not inhabit places; they move from one place to another along a path or trajectory. The goal, then, is a place at the end of a path. Thus, the terms of place, goal and path are connected on the basis of the path schema

(Johnson, 1987). Any object which moves on a trajectory has certainly started at some place of origin, and this will come to a stop at a place of destination.

Considering the indications of Bréal (1897: 280) about the varied aspects of senses and meanings, talking about the life of a language, the languages of living organisms, including human intelligence, new words, words that change and words that disappear, metaphor, and the use of figures are necessary to comprehend a language:

> *Cependant, sous l'aspect varié et changeant qu'elle présente, un esprit qui ne se contente pas des apparences peut désirer pénétrer jusqu'à la cause première, qui n'est autre que l'intelligence humaine: car de dire que les mots naissent, vivent entre eux et meurent, cela est, n'est-il point vrai? pure métaphore. Parler de la vie du langage, appeler les langues des organismes vivants, c'est user de figures qui peuvent servir à nous faire mieux comprendre, mais qui, si nous les prenions à la lettre, nous transporteraient en plein rêve.*

Navarro i Ferrando (1998: 23-28) reviews diverse approaches to the function of prepositional meaning:

1. Hjelmslev's government theory:

As far as the function of prepositions is concerned, Hjelmslev (1935) compares two functions from the *government theory*: *government* and *subordination.* Government entails the meaning of a syntactic dependence on other elements and its character, and decides when subordination happens between elements. Then, there is a concordance between these elements used with prepositions.

In *pure government*, there is a *pure concordance*. Nouns (primary rank) control adjectives (secondary rank). In *complex concordance*, there is *complex government*; adjectives control nouns. In this case, this concordance does not influence prepositions and adverbs (third rank).

However, prepositions or adverbs (third rank) and nouns (primary rank) may function in *complex government*. This function may be for controlling or being controlled. Adjectives (second rank) may control nouns (primary rank) or prepositions and adverbs (third rank).

In this classification, prepositions (third rank) may only represent a function in the domain of complex government. This function refers to syntactic function and syntax associated with sentence structures and grammatical rules. Prepositions are, therefore, understood as controlling terms because of the derivation of the Latin language (Hjelmslev, 1935). There is an identification of two categories: case meaning and preposition regarding a comparison of languages from which some may have case meaning or not. The foreign languages employ prepositional usage to communicate case meanings. In this way, the theory of the case is applied to indicate prepositional meanings.

Therefore, to summarise, prepositions indicate direction meanings, such as spatial relations in a scene. In a subordination category, prepositions are in the third rank. In complex government, prepositions control or govern other terms. In related words, prepositions show natural dependence on other terms. This nature is seen in the spatial domain. Hence, prepositions express spatial connections among objects.

2. *Brøndal's logical conception*:

Brøndal (1948) classifies parts of speech in four logical concepts: 1. *Substance: Relatum (R).* 2. *Relation: Relator (r).* 3. *Quantity: Descriptum (D).* 4. *Quality: Descriptor (d).*

Brøndal does not apply structural characteristics in prepositions. The logical concept of *Relation* expresses the category of prepositions. The function of a preposition indicates a relation. Prepositions and adverbs are distinguished between meanings but are used for employing logical concepts. Even though their syntactic usages are known, prepositions are understood to have a unique and abstract sense. Logical forms of relation are symmetry, connection, transitivity, variability, plurality or generality.

3. *The functionalist conception*:

According to Jespersen (2013), rank theory classifies the words in a syntactic category. The first rank presents nouns, the second rank presents adjectives and verbs, and the third rank includes prepositions, adverbs or conjunctions. There is no distinction separating prepositions and conjunctions (*and, or*) because they are replaceable.

In dependence grammar, prepositions are essential units for the *Theory of Transfer* (Tésnière, 1959). *Full words* are separated from *empty words*. Full words determine semantic categories and empty words determine a transformation and relations to full words. There are some features in a structural point:

1. Full words (they are in a boundary to present a structural category and they are variable).

2. Subsidiary words (they do not present structural categories, and they are not variable)*: 2.1 Junctives* (they connect *full words* and are added to the sentence construction in a coordination way), and *2.2 Traslatives* (they are prepositions, subordinators, relative pronouns, auxiliaries, and they connect phrasal constructions).

Tésnière (1959) proposes that traslatives do not have lexical meaning but structural meaning. Prepositions indicate first degree transfer, and subordinators indicate *second degree transfer*. Thus, lexical meaning is not attributed to prepositions and subordinators that are simply structural units with a specific function.

4. *Functional grammar by Martinet:*

Martinet (1985) uses the notion of *moneme* associated with a *sense effect*. There are bound and free *monemes*. Prepositions are *free monemes* that are called *functionals*.

Prepositions and other *monemes* or functional words are related in sentences. For example, prepositions and conjunctions are classified in the same class of functional words.

5. *The structuralist conception:*

5.1 *American structuralism*: prepositions are separated from adverbs and subordinators (Bloomfield, 1935). On syntax, prepositions are understood to be *free forms* and represent a *form class*. Prepositions indicate *exocentric constructions* which are in different structures.

5.2 *European structuralism:* Pottier (1962) presents a comprehensive study of syntactic units. Prepositions are considered to be particles that connect elements. Having the nature of a unit, prepositions express relations, which may be distance or nearness in space. Prepositions may regard some meaning distinctions but not connected with discourse.

In summary, prepositions are described by these authors:

1) Hjelmslev presents a governing unit being in the *complex government*.
2) Brøndal presents a *relator* being in the logical category.
3) Tésnière proposes a *transfer marker,* and Martinet proposes a *function marker* in a structural category.
4) Jespersen notes prepositions, adverbs and subordinators are in *the third rank* due to the replaceable units in a semantic and syntactic category.
5) Bloomfield notes a *free linguistic form* that forms *exocentric constructions*.
6) Pottier defines *a relational morpheme* connected with adverbs and subordinators, having a unique sense.

Therefore, Hjelmslew did not consider structural prepositions in Semantics. Brøndal and Pottier did not consider different senses. Unlike these considerations, I propose that prepositions display senses and each preposition stands for different senses from other prepositions, being a polysemous structure. In contrast to Jespersen, prepositions are not replaceable, and neither are they in the same rank as conjunctions without a modification of context. The polysemous structure is described in section 2.3.1.

According to Navarro i Ferrando (2000: 190-191), there are two positions regarding prepositional semantics (see figure 3). First, a preposition has just one meaning that is a *core sense,* and the other position is that a preposition does have multiple meanings:

1. In the first position, the meaning of a preposition is viewed as a *core sense.* This position manifests in two trends:

a) A *core sense* explains the various uses, being the word defined in the dictionary. The context presents additional information not included in the meaning of a preposition (Bennet, 1975).

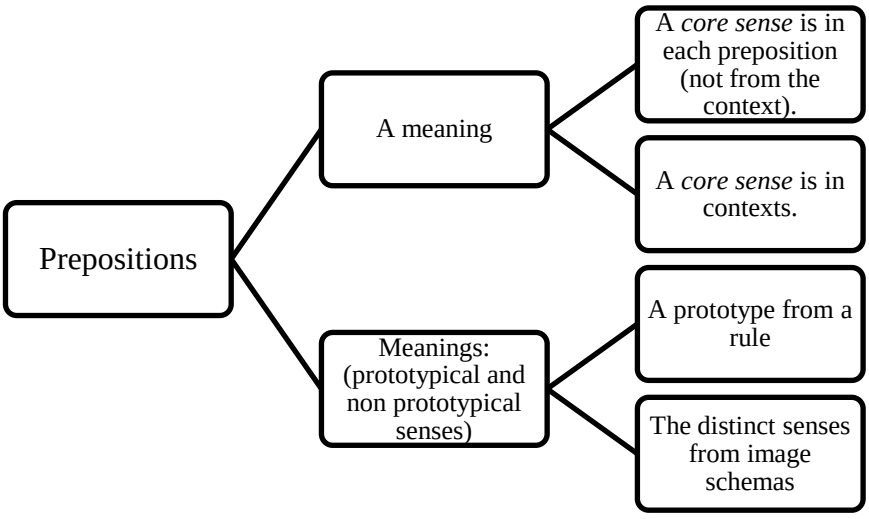
b) A *core sense* can appear in different contexts. The contexts provide distinctions of meaning which can be attributed to a preposition so that the *core sense* is understood in all these meanings in various contexts (Herskovits, 1986).

2. In the second position, prepositions are seen as polysemous words with a prototypical sense and non prototypical senses. There are two trends:

   a) To assign a prototype it is necessary to follow a rule (Cienki, 1989).

   b) The distinct senses of a preposition may be acquired from *image schemas* by way of similarities and transformations in image schemas (Lakoff, 1987; Vandeloise, 1991; Boers, 1996; Navarro i Ferrando, 1998, 2000; Cuyckens, 2001, 2002).

Figure 3. A summary of the meaning of prepositions in Semantics.



In the dictionaries, there was a space to introduce a unique sense of each preposition, and considering any variation was a consequence of the context. A unique sense was identified for every lexical unit defined as a *core sense*. Bennet (1975) claims that the sense of *over* was locative and was to be understood in all the instances of *over*. Brugman (1981) demonstrates that a unique sense did not always occur, but some

senses were derived from others. In that case, some senses may have a characteristic in common. On the periphery, the senses may not have a semantic characteristic in common. However, in the centre, prototypical senses may have major shared semantic characteristics in comparison with peripheral senses.

Considering child language and the use of prepositions (Morgenstern & Sekali, 2009: 272), prepositions are seen as semantically **coloured** (having a lexical and a spatial value) or, by contrast, they are seen as colourless (having a function value and a lack of semantic meaning). Depending on the interpretation, a preposition may depict functional or lexical value. For instance, *I'm going to London* (lexical value) or *give it to him!* (functional value in a dative case). In the prepositional analyses by the uses of children, French children tend to use functional prepositions firstly, and in opposition, English children tend to use spatial prepositions:

> *In this opposition, quantitative observations of early uses of prepositions show that the French and English children studied did not behave in the same way, with a clear priority of spatial first prepositions for the English children while the French children used mainly functional ones first* (Morgenstern & Sekali, 2009: 283).

2.3.2 The semantics and polysemy of prepositions

According to English grammar (Huddleston & Pullum, 2002; Oxford English Online Dictionary), there are over one hundred English prepositions. They indicate a relation between two entities (i.e. these entities may be people, places or objects). Although the structure of most prepositional phrases is usually easy, English prepositions are complex in syntactic structures. Most prepositions have more than one meaning, as described, for example, in the prepositional approaches of polysemy (Navarro i Ferrando, 1998).

Among the range of research on prepositions from the Cognitive Linguistic perspective, Navarro i Ferrando (1998, 1999, 2006a, 2011) provides a fully-fledged model for the semantic representation of prepositions whose senses are derived and arranged in terms of three semantic dimensions within perceptual space or aspects of construal. Therefore, three dimensions can help in determining the spatial relationship established between the two entities (trajector and landmark) in human conceptualisation, concretely:

> *1. Topology: The visual perception of objects gives the speaker clues for establishing and conceptualising topological relations like coincidence, contact, inclusion, proximity, and the like.*
>
> *2. Force-dynamics: Human beings have experience of self-motion and object motion, which provides clues for conceptualising patterns of interaction in terms of dynamics.*

> *3. Function: Human beings have experience of the effects of interaction, as well as the consequences of those effects for survival and well-being* (Navarro i Ferrando, 2006a: 171).

English prepositions indicate relationships between physical objects in their visual perceptions, arrangements, orientations, and so forth. Several senses are included in the polysemy of prepositions in different contexts, and therefore understanding the use of each preposition is difficult due to these related senses.

Referring to diachronic semantics, some utterances may express a polysemy sense formulating a temporal sequence of events, or situations may be accepted as formulating causal rather than just a temporal sequence by pragmatic inference (Geeraerts, 2010: 147). This shift from a temporal to a causative reading of the connectivity of the different senses appears in instances of use in which both occur. In the following series of examples, point b) is joining context between points a) and (c) in the polysemy chain:

a) Temporal: *I have done quite a bit of writing since we last met*

b) Temporal and causal: *Since you lost your favourite fountain pen, you seem to have been suffering from writer's block*

c) Causal: *Since he didn't want me to sign with a pencil, he lent me his pen*

In point b) *since* would be a contextual reading of the temporal action as exemplified by a). Then, the causal reading is pragmatically determined in the context of use, and this point need not be stored in the semantic list. Reading point c), on the other hand, *since* should be included in the Semantics, as a polysemy sense. Although to promote the causal reading to a conventional state, the word list should be maintained in cases like b): the more joining contexts appear, the more likely the causal reading can be removed from the temporal one.

Moreover, the most developed model in contemporary Semantics is the Generative Lexicon described by Pustejovsky (1995). In drawing attention to the Generative Lexicon framework, the following four points are included: the general features of the model; the representational structure used in the Generative Lexicon; the variable ways in which the model is further realised; and some points of interpretation (Geeraerts, 2010: 151).

1. Two features characterise the principal position of the model in the framework of lexical semantics. First, Pustejovsky is interested in the information of regular polysemy. Some examples of regular polysemy, also called "logical polysemy", include words such as *body*, or the alternation between a countable object reading and an uncountable body of an object reading in *I put a glass on the table* versus *the present is made of glass*. The imaginative possibilities of this object and body alternating may be recognised from these examples *after the unhappy encounter, the floor was littered with pieces of Ming vase.*

The pattern may happen in the other direction when nouns usually used in an uncountable sense are used not as body nouns but as object nouns: *he ordered two coffees*. The relationship between process and result *my purchases took me just under an hour/the purchases are still in the trunk of the car*, or between contents and container *the whole lecture hall laughed/the lecture hall is at the end of the corridor.* Also, verbs present regular polysemy: the reading of *follow* in *please follow me to the exit* versus *the red car followed me for a few minutes.*

After considering it for regular polysemy and creative language use, a second general aspect of the Generative Lexicon is its position within the order of words. In explaining the creative use of language, it focuses on the lexicon, a formal lexicon that lists word senses as a key element embodying this phenomenon. This connects with logical representations of meaning, and then it tries to supply a representational design suitable for Computational Linguistics.

2. What does the format look like? The Generative Lexicon sets some procedures to generate semantic interpretations for words in appropriate contexts. These procedures do not unexpectedly create readings; they consider the knowledge coded in the system for each lexical item. This coded knowledge corresponds to a general design with different types of information structures. Thus, the configurations are the following: the 'argument structure' presents the number and nature of the arguments; the 'event structure' presents the event type of the phrase, and also the internal event structure; and the 'qualia structure' is a set of detailed characteristics that is equivalent to the standard definitions of meaning (Geeraerts, 2010: 149).

3. The perspective elaborated by Pustejovsky is developed in different orientations. Three points of development may be mentioned. The first point is that the intention is to contribute to Computational Linguistics, connected to computational lexical semantics.

The second point is an addition of Copestake & Briscoe's suggestion (1996: 15-20) to introduce lexical rules into the structure of the Generative Lexicon. These authors suggest that in acquiring the generalisation by means of a lexical rule, it formulates the regularity as a possible transformation on the semantic illustration of lexical items. Lexical rules are an influential mechanism. Instead of insisting on the polysemy of an individual lexical entry, it takes the form of a general rule.

In the third point, some authors such as Asher, Lascarides, and Copestake (1998: 387-414) have detailed that the context of an ambiguous expression for lexical items does not just depend on the words that the item comes with. The general approach of the Generative Lexicon is to obtain a lexical representation, which is then interpreted on the basis of the context itself. These authors explain a concrete type of metaphor, which may be detailed by a Lexical Metaphor Rule, in which concepts indicating physical objects are applied to humans. Thus, *John is a rock* may be interpreted as "John is heavy, solid or hard to move", although the lexical rule as such does not give any clue to the accurate interpretation. It means John is very reliable, dependable or solid in character.

4. The Generative Lexicon model is the most developed one since it tries to apply a template for the contextual adaptability of meaning. Then, it does so in a more elaborate way than the previous studies to specify pragmatic examples. The discourse-oriented principles of interpretation also comply with the semantic or sentence-oriented principles emphasised by Pustejovsky.

The most polysemous words in English and other languages are prepositions (Taylor, 2005: 112-114). According to mainstream accounts, this prepositional usage is idiomatic and *just has to be learnt*. This polysemy is reduced to homonymy. Hence, the presentation that prepositional usage is highly structured has likely been one of the primary achievements of the cognitive paradigm.

In fact, there is no reason to suppose that prepositional categories in different languages should be structured similarly, and a preposition in one language hardly ever has a unique translation comparable to another language. However, the non-equivalence of prepositions among languages is no reason for accepting that prepositional agreement is an arbitrary or personal decision.

According to Navarro i Ferrando (1998), researching the coherence in spatial polysemy is relevant since the polysemy of prepositions is often looked on as a formless list of idiomatic and abstract senses that bear no relation to one another. On the face of it, observation has been confined to central senses.

In Cognitive Linguistics, there are some research points of view about space semantics that are likely to create an order, despite the difficulty of the concepts, through the application of a system of radial networks, in which each prepositional or adverbial sense is located on a node in accordance with its centrality within the network (Lakoff, 1987; Brugman, 1981; Langacker, 1987; Deane, 1993, 2005; Navarro i Ferrando, 1998, 2000, 2002, 2006a, 2011; Sandra, & Rice, 1995; Tyler & Evans, 2003). More literal (spatial or physical) meanings tend to be the most frequent from which abstract meanings (see figure 4) result with the help of metaphoric and metonymic processes.

Cognitive Linguistics has exposed several attempts at presenting the form of prepositional polysemy. The preposition *over*, for example, is a polysemous lexical unit detailed by Brugman & Lakoff (1988). These authors affirm that a *core sense* of *over* is unlikely to be found, which means a unique feature that should be relevant to all the senses of this preposition. Hence, a prototype or family resemblance model for the representation of polysemy is used, in which some senses are more peripheral and others prototypical. The boundaries of a category are unclear and often coincide with other prepositions. *Image schemas* are used to give a representation of meaning instead of features.

Furthermore, the particles like *out* and *up* are meaningful concerning Verb Particle Constructions (VPC). As laid out by Lindner (1983), these particles provide the meaning of VPC. Each of these two particles has several senses, both abstract and concrete. Particles (*out* and *up*) involve united concepts which are related respectively.

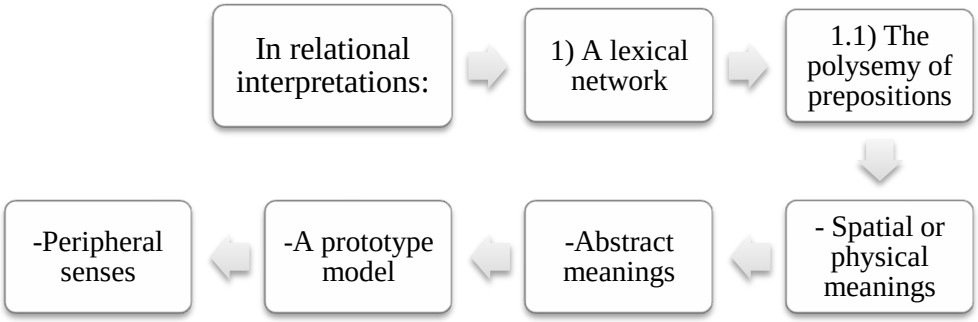
Each semantic structure is distinguished by a schematic structure, a network of concrete meanings together with a schema of general meaning.

For instance, three main groups of senses are classified for *out*: expansion, departure or removal. Then, various spatial forms, metaphoric extensions or abstract domains appear. For *up*, two sense groups are classified: approach and vertically higher. These are also linked with a connection of family resemblance.

Some authors (Boers, 1996; Lakoff, 1987; Johnson, 1987) use the *lexical network* to explain spatial metaphors and to show distinct and related senses. Thus, this lexical network has been used for providing the polysemy of prepositions in different languages such as French (Vandeloise, 1991).

The usual metaphors of a cultural group resemble this group's usual patterns of thought (Boers, 1996: 28). Comparable instances of usage reflect the degree of acceptance of a used metaphor. In that conceptual structure of metaphor, the contrastive observations confirm that some metaphors or thought arrangements are more traditional in one linguistic culture than in another. Abstract thought may vary across cultures, and these distinctions already happen at the level of language variances.

Figure 4. The main concepts of a lexical network.



2.4 Cognitive Linguistics and prepositions

Traditionally, prepositions have been classified from the following three points of view (Navarro i Ferrando, 1998: 21):

- In morphological terms, prepositions have been used as invariable words which do not vary in different contexts.

In syntactical terms, prepositions have been defined as *preposed words* as their name indicates.

In logical terms and following Aristotle, prepositions have been considered link words, enclosed in the same class as subordinators and co-ordinators. Thus, prepositions have been regarded as items that express relations. As a result of Descarte's philosophy and the principle of innate ideas, a tradition was established by Port Royal grammar whereby each word had only an abstract sense in any context. Therefore, each preposition should express an abstract sense of relation without considering an abstract, spatial or temporal character. For the first time, prepositions were defined as the general expression of relation.

In the localist tradition, the original sense of prepositions is the spatial one or the concrete. In contrast, other senses (modal, temporal or abstract) would be defined as deriving from the ancient spatial sense. Thus, traditional grammar has played a part in determining the twentieth century's linguistic theory and notions of categories.

In speaking of the classical approach to categorisation (Taylor, 2005), the above-mentioned approach to the categorisation of prepositions is classical since it goes back to Greek antiquity. It also dominated philosophy and Linguistics (both structuralist and generative) throughout the twentieth century. Aristotle is known for distinguishing between the essence of a thing and its accidents. The essence defines its essential nature, whereas accidents are incidental features, which play no part in verifying what a thing is.

An example is the *essence of man* in the sense of a *human being*, a *two-footed animal*. Thus, each of the features is required for membership in that category. If an entity does not show either of them, it will not be a member of the category. An entity that shows each of the two common features mentioned above is a category member. The evidence of the classical theory is as follows (Taylor, 2005: ix-x; Lakoff, 1987):

-Categories are named in terms of a conjunction of necessary and sufficient features.

-A category classifies into two sets of entities: those that are members of this category or those that are not. Features are binary (twice or duplicated). There are no ambiguous or unclear states.

-Categories have clear boundaries. Inside, there are no levels of hierarchy, meaning no entity is a more important member of the category than others.

-All members of a category have an equivalent status.

Considering the comments of Bréal (1897: 308) in the paragraph below, which explains the evolution of a language and the transformation due to human intelligence, such as the French language coming from Latin, or the English from Anglo-Saxon. These languages present an identity, sounds and inflexions (the processes of adding an affix to the root of a word):

> *Mais nous ne doutons pas que la linguistique, revenant de ses paradoxes et de ses partis pris, deviendra plus juste pour le premier moteur des langues, c'est-à-dire*

pour nous-mêmes, pour l'intelligence humaine. Cette mystérieuse transformation qui a fait sortir le français du latin, comme le persan du zend, comme l'anglais de l'anglo-saxon, et qui présente partout sur les faits essentiels un ensemble frappant de rencontres et d'identités, n'est pas le simple produit de la décadence des sons et de l'usure de flexions; sous ce phénomènes où tout nous parle de ruine, nous sentons l'action d'une pensée qui se dégage de la forme à laquelle elle est enchaînée, qui travaille à la modifier, et qui tire souvent avantage de ce qui semble d'abord perte et destruction.

According to the Merriam Webster Online Dictionary, the definition of a preposition is:

-A function word that typically combines with a noun phrase to form a phrase which usually expresses a modification or predication.

-What is a preposition?

Prepositions show direction, location, or time, or introduce an object. They are usually followed by an object—a noun, noun phrase, or pronoun. The most common prepositions are just a few and very common:

-At, by, for, from, in, of, on, to, with.

Prepositions typically show how the noun, noun phrase, or pronoun is related to another word in the sentence (e.g., a friend of mine). Prepositions with their objects form prepositional phrases. A preposition may appear at the end of a sentence or clause, but only when its object comes earlier (it is the chair you are sitting on).

Many prepositions (such as past, under, off, along, and on) may also act as adverbs that are words that modify verbs, adjectives, other adverbs, or sentences (e.g buried under by the avalanche. They drove past). A few (including before, after, for, and since) may act as conjunctions that are words that join together other words or groups of words (e.g., call me before you go. We will come after we make plans).

The origin and etymology of the term preposition:

- The first known use was in the 17th century, in the middle English preposicioun, from Anglo-French preposicion, from Latin praeposition-praepositio, from praeponere to put in front, from prae- pre- and ponere to put.

As stated by the English Oxford Online Dictionary, the usage of this term is:

There is a traditional view, first set forth by the 17th-century poet and dramatist John Dryden, that it is incorrect to put a preposition at the end of a sentence, as in where do you come from? or she's not a writer I've ever come across. The rule was formulated on the basis that, since in Latin a preposition cannot come after the word it governs or is linked with, the same should be true of English. The problem is that English is not like Latin in this respect, and in many cases (particularly in questions and with phrasal

verbs) the attempt to move the preposition produces awkward, unnatural-sounding results. Winston Churchill famously objected to the rule, saying, 'This is the sort of English up with which I will not put.' In standard English the placing of a preposition at the end of a sentence is widely accepted, provided the use sounds natural and the meaning is clear.

2.4.1 The terms of the trajector and the landmark

When a relationship is outlined, a degree of distinction is occurs between its participants (Langacker 2008: 70-72):

The most relevant participant is called **trajector** (TR); it is the entity denoted as being located or described. This can be pointed out as the primary focus within this relationship. Sometimes another participant can be pointed out as the secondary focus, called the **landmark** (LM). Representations can be in the same relationship and the same content but distinguished in meaning because of the different choices of trajector and landmark.

Many relational expressions have a principal participant, making it the TR by default. This relationship has an effective mover through space with verbs like to *come* and to *arrive*. These locations are continuous and they remain in the background. Even though the TR does not have to be a mover itself, there is often a spatial movement, and TR and LM are defined as primary and secondary. These notions are appropriate to any cognitive domain.

For example, *before* and *after* designate the issue of where to look for the participant in the same relationship. Whether the participant functions as profile, TR or LM, the notable participant is identified by the organisation of the linguistic elements used, and in accordance with the semantic values.

The terms trajector (TR) and landmark (LM) are similarly related to the notions of figure (TR) and reference object or ground (LM). In terms of defining the notions of TR and LM, the TR is the entity that experiences motion and moves from a position in relation to the LM. These terms come from Langacker's theory of Cognitive Grammar (1987) and have been largely employed in cognitive semantics.

Then, TR relates to the smaller entity in a scene and is naturally movable in motion scenes. However, LM relates to the entity about which the TR moves. The TR and the path of motion are located over the LM. Lakoff reported in an example that the central image schema of over is especially schematic, sometimes lacking detail about the nature of the LM and the contact between the TR and LM. Moreover, each preposition carries a different sense, and landmarks can be *horizontally extended* or *verticality extended*, which means that they can be extended throughout the horizontal plane or the vertical plane of the LM.

For example, *the bird flew over the yard*. Here the bird's flight is the TR, extending across the yard that is the LM.

Therefore, the grammatical functions of subject and object described by Langacker are considerations of perspective or spatial technique and thus have conceptual support. The distinct features between subject and object connect to the prototype of an action chain, a cognitive model involving an active *energy source* (agent) that gives energy to an *energy sink* (patient). The semantic pole of the expression that carries out the subject function is called the TR, which indicates the prototypical subject is active, whereas the semantic pole of the expression that carries out the object is called LM. This observation indicates that the prototypical object is inactive. In an English sentence, the subject (TR) appears first and the object (LM) appears second.

- For example, *George ate all the caviar*. (As an active sentence)
- *All the caviar was eaten by George*. (As a passive sentence)

Regarding the active sentence, the participant (TR) is *George*, the TR, and the action agent. In contrast, the secondary participant (LM) is the *caviar*, the LM and the patient. In the passive sentence, the situation is opposite, the participant and trajector (TR) is the *caviar*, and the landmark (LM) is *George*. There is no object here since passive sentences do not take objects.

Levinson (2004) explains conceptual domains underlying the language of space:

With regard to *Where*-questions, the spatial domains are essentially location and direction. A spatial domain has uniformities and also internal divisions or subdomains. The relation between *figure* and *ground* has an important concord apart from *Where*-questions (Levinson 2004), the thing to be located is the figure and the thing with respect to which something is located is called the ground. This terminology was introduced by Talmy (1983) and is equivalent to the older terms *theme* and *relatum*, and the more recent terms *trajector* and *landmark* were introduced by Langacker (1987). Both elements are used in spatial descriptions, in other words, the relations of figure and ground in a scene. In a case in which spatial language had property, space would be considered the relations between things and not an abstract void as laid out by Newton or Kant.

In some languages, abstract spatial quantities play a role. For instance, *the white pigeons fly north at this time of the year.* Here *north* is not an LM or goal but an abstract direction itself. Where-questions tend to extract answers whose location of the figure is specified in relation to the ground.

According to Navarro i Ferrando (1998: 180; 208), in a conceptual schema, there is a sense and a dimension that provide an understanding of the concrete sense (see figure 5 and figure 6).

For example, *the lamp is on the table*. The lamp is the trajector (TR) which can be moved easily and rests on the landmark (LM), in this case, the table, which can work as a supporting point for the TR. The dimension is topology, and the sense is contact.

Another example: *now let us imagine a group of B-52's, on alert near their "positive control (or fail-safe) points", the spots on the map, many miles from.* A group of B-52's on alert is the TR which can be moved easily and its resting side falls on the LM. Their positive control points, in this case, can work as a place for the TR. The expression "on alert" is considered an idiom, and in this sentence people are in command of their activities. Then, the dimension is function and the sense is control.

In addition, Talmy (2000) compares the notions of TR and LM in terms of motion, location, size, predominant and perception.

Table 2 shows the main characteristics of TR and LM in a spatial space (adapted from: Talmy 2000: 183):

Trajector	**Landmark**
More movable	More located essentially
Has undiscovered spatial properties	A reference entity
Smaller	Larger
Lately in the scene	Earlier on the scene
Dependent	Independent
Relevance	Less importance
Less directly perceivable	More directly perceivable

Table 2: trajector and landmark (adapted from Talmy 2000: 183)

In Vandeloise's spatial relations (1991), TR and LM are described:

The object to be located is called the *trajector* (Langacker) and the corresponding reference point, the *landmark*. Vandeloise (1991) calls *target* the object to be located and *landmark* the reference object. In well-formed utterances, the target always corresponds with the subject of the relation, and the LM coincides with its object. The linguistic principle may be expressed as follows:

- *The subject of spatial relation = target*
- *The object of spatial relation = landmark*

What are the characteristics of target and landmark? It should be pointed out that the position of the target constitutes new information, while the position of the LM repeats the known information. Although the target is difficult or small to perceive, generally, the LM is prominent and easily distinguished. Moreover, the target is mobile, while the LM is immobile and stable. For instance (Vandeloise, 1991: 22):

- *Look at the falling star! Near the church tower.*
- *(Regarde l'étoile filante! Près du clocher)*
- *Look at the church tower! Near the falling star.*
- *(Regarde le clocher! Près de l'étoile filante)*

The falling star, momentary and brief, is drawing the speaker's attention. It seems as it is the ideal target, while the church tower, immobile and immense, shows the characteristics of the usual LM. In contrast, the second sentence is uncommon. Other examples are (Vandeloise, 1991: 23):

- *The bus stop is near the house.*
- *(L'arrêt du bus est près de la maison)*
- *The house is near the bus stop.*
- *(La maison est près de l'arrêt du bus)*

In this contrast, the sentences above are seen as an element that is not understood explicitly, referring to the pedestrian's path between the house and the bus stop. The first sentence may be understood by imagining a principal path from the house to the bus stop, whereas the second sentence suggests the opposite course. Indeed, both target and LM are immobile in both examples, and the question of which sentence is acceptable would be answered by the speaker, who may possibly move along the path.

When describing the scene, the speaker could choose from several different strategies for situating the LM. When an LM is eliminated, which is not egocentric, there is one strategy between not introducing an egocentric LM and expressing an LM with the correspondent preposition. Thus, the LM may be omitted when the person analysing the situation identifies the LM sufficiently (e.g., *Saint-Cloud. Paris is near Saint-Cloud*). The degree to which the speaker locates the LM determines the situation in which this LM is expressed or not. Then, the LM refers to the fact of the *actual* position of the speaker.

Therefore, the speaker could change a variety of points of view, and a conversation may continue as long as the addressee is able to understand the situation and the movement of the speaker in such a case. The unexpressed LM often identifies the speaker's position, but this position may be either real or virtual. Concerning the expressions *near* and *away from*, the speaker has to move to the place of the LM itself.

These expressions *near* and *away* are described as distance indicators between target and LM. In terms of distance, it is necessary to use these two prepositions depending on the movement to be focalised whether the target/LM or the LM/target. The expression *près de (near)* is reduced to spatial and temporal domains, whereas *proche de (close to)* suggests proximity in every domain.

Thus, the expression *near* would refer to a smaller distance than *away from*. For instance (Vandeloise, 1991: 67):

- *Jupiter is near Saturn*.
- *(Jupiter est près de Saturne)*
- *The electron is far from its nucleus*.
- *(L'électron est loin de son noyau)*

In the first sentence *near* is identified as a larger distance between target and LM than *far from* in the second example. So, the principal characteristic of distance as a norm is relative to the standard accessibility of the target/LM to the LM/target.

Figure 5. Terms used for trajector.

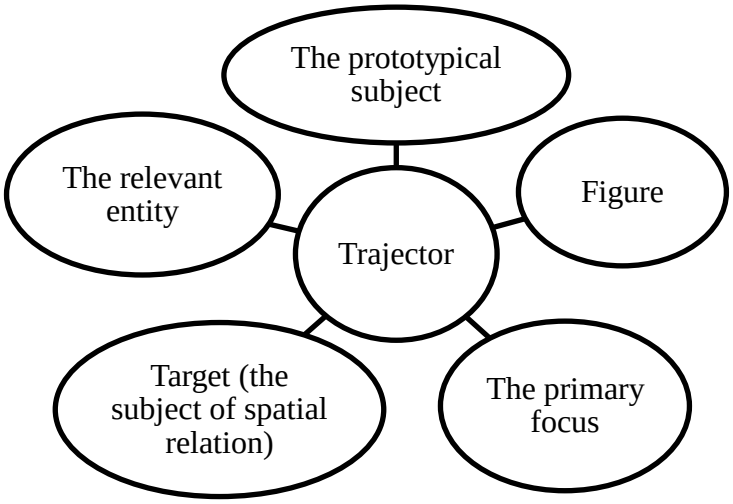
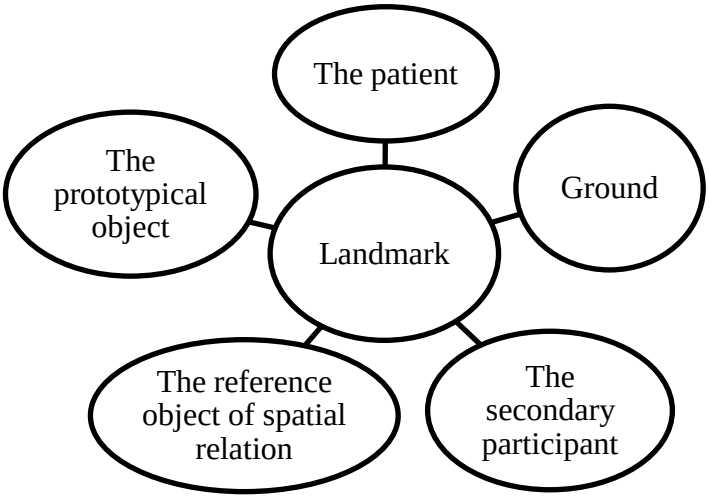


Figure 6. Terms used for landmark.



2.4.2 The trajector and the landmark in three perceptual dimensions

Regarding the specialisation of meaning, metonymic and metaphoric extensions can be shown in senses. These senses can be detailed by profiling particular aspects of the dimensional parameters and image schemas. An image schema (Lakoff, 1987; Johnson, 1987) is a developed pattern of our imaginative experience and perception from a scene. To understand a scene, the following three dimensional parameters (topology, dynamics and function), a TR and an LM are all defined below (Navarro i Ferrando, 1998):

In the force-dynamics dimension, the interaction axis between TR and LM is seen as the central aspect of the relation. Though still present, other factors like the topological relation and the functional orientation stay in the background.

In the topological dimension, the predominant topological relation influences force-dynamic or functional aspects.

In the functional dimension, from the conceptual image schema in a scene, the functional space can be described by the relation of functionality. The speaker's conceptualisation maintains the force-dynamic dimension and the topological relationship in the background.

Within each dimensional parameter, a sense predominates in the following examples (Navarro i Ferrando, 1998: 185; 195; 201; 207):

-The sense of **contact**: there is a relation of contact between TR and the LM, and between the supporting side of the TR and the external side (surface) of the LM (e.g., *He was warming his hands on the cup, although the room was heavy with heat*).

-The sense of **support**: the TR finds some kind of support thanks to the presence of the LM (e.g., *pictures of her in more glamorous days were on the walls. The lamp is on the ceiling*).

-The sense of **motion to support**: the TR shows some kind of motion that comes to an end once it comes in contact with the LM (its surface), and in position where the TR gains control over itself (e.g., *Bob Fogg made his first landing on what is now part of the Montpelier airport. He had thrown his note at him*).

-The sense of **control** of LM: the TR has control over the LM or the situation described itself (e.g., *don't you have to spend any time on your ranch? The worker who lives on a farm cannot change jobs readily*).

In addition, the three dimensions (topology, dynamics and function) appear at the same level of relevance to present the concrete meaning of prepositions *in*, *on* or *at* (Navarro i Ferrando, 1998, 2001, 2006a; Silvestre-López, 2009). In context, each of these

prepositions also shows a concrete functional relation between TR and LM, such as control, operation, intentionality, among others (Navarro i Ferrando, 2006b). The functional association has its origins in physical experience, interaction and movements within settings.

2.5 Prepositional categories

Relating to classical and natural categories, the term categorisation is associated with perception, action, speech or thought. The term *nominalism* is the philosophical view which rejects the real existence of abstract objects and universals, but recognises the existence of terms such as names and general terms. This view insists that similarity is a matter of linguistic convention. *Realism* describes categories as remaining independent of language and its users and claims that words designate pre-existing categories. There are other classical theories of categorisation in which a category consists of objects in a container, and these categories belong in a world independent of human beings. The main principles of classical categorisation can be described as follows (Lakoff, 1987: 7-8):

- In each category, there are sufficient and necessary conditions to define membership.

- Characteristics occur as binary (there is or there is not), all of them necessary and having the same status.

- These categories have precise and fixed boundaries (members - non-members).

- The members of a category have the same status (full members), and non-members of a category also have the same status. There are no degrees of membership.

Concerning the implications for linguistic categories, natural prototypes could have several connotations (Rosch, 1973; Lewandowska-Tomaszczyk, 2010: 148):

- There are other domains that are established by natural categories.

- In non-perceptual domains, the clear examples of non-perceptual categories are artificial prototypes, which may alter the learning and procedure of categories in that domain, and in a similar mode to the effects of natural prototypes.

Distinguishing categories into elements is commented upon: in cognitive models, the distribution is separated automatically, but there is also evidence that control is a motivating force at some stages.

Accordingly, after comparing the meaning of prepositions, some examples are written to illustrate the uses in the following sections. Then, each sentence and the preposition are analysed regarding the frames of reference, the dimensions of topology, force-dynamics and function, the spatial relations, and the two concepts, TR and LM.

To understand the tree structure of sentences, some analytical concepts should first be made clear. In traditional grammar and modern syntactic theory, constituency is an essential construct. Linguists describe it as assigned fixed hierarchical structures considered metaphorically as inverted "trees". However, details vary, and styles may change. Still, an example of the usual format is the nominal or noun phrase such as *a table* (noun phrase- article and noun) or prepositional phrase- preposition, article and noun, e.g., *at the cinema*.

Three kinds of information can be found in syntactic tree structures. Grammatical category (N, P, NP...), linear order (left to right on the page) and constituency (hierarchical grouping). Prime examples are the subject and object relations. Thus, a subject is designated as a nominal whose profile corresponds to the TR in a profile relationship. An object is characterised as an LM in a profile relationship.

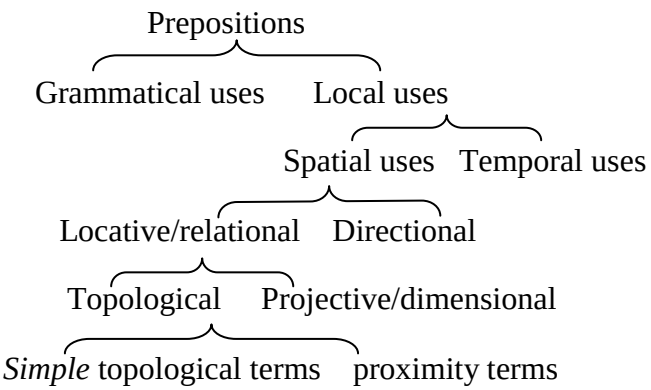
The act of talking must be called a complex activity that people do rather than a language they have. Some aspects of this activity are motor, perceptual and mental procedures in the brain, which is to say talking is a cognitive activity in a broad sense.

The knowledge of a language illustrates a situation where controlling skills in distinct contexts are highlighted. Specific regions of the brain are involved in language, and the processing activity is made up of linguistic units. Thus, these units are not separate or independent, but they overlap with other units or add them as components.

In general, units embody the regularities of a language. Thus, linguists may consider regularities as constructive rules, filters or schemas. Cognitive Grammar explains regularities as abstractions that take the form of schemas. Categorisation relationships connect these units to form networks of any size (Langacker, 2008: 219).

Figure 7 shows a functional classification of prepositions. The contrast is made between *grammatical* and *local* uses. In grammatical uses, a preposition does not transmit meaning; the function is as a syntactic marker (*of, for*). In contrast, the local uses indicate spatial or temporal meanings of prepositions.

Figure 7. Prepositions classified (from Coventry & Garrod, 2004: 7).



Thus, locative/relational notions are often classified into *topological* and projective, dimensional terms. The topological terms involve prepositions such as *in, on* or *near*, which indicate a static topological relation between objects. Furthermore, within the notion of topology, the simple topological terms *in* or *on* are considered, as well as such proximity terms as *near* or *far*, which provide information about the distance between objects. Projective terms present information about the direction, where an object is situated with reference to another one, such as *in front of,* or to *the left of*.

Projective prepositions (*in front of, to the left to,* or *above*) indicate a direction. These prepositions are the only ones in English that admit intrinsic, relative and absolute frame of reference. In some cases, more than one frame of reference plans onto the same expression. For instance, *the wing mirrors are above the man* is suitable for the perspective of absolute and intrinsic frames of reference.

Thus, these projective prepositions are considered in relation to the reference frame's designation. Each term may be used in several ways, each with an interpretation of the spatial frame of reference (see section 2.7).

2.5.1 Grammar: The category of prepositions

In traditional grammar (Huddleston & Pullum, 2002), the common definition of a preposition is a word that controls other words, and usually goes before a noun or pronoun and connects it to the surrounding words (noun or pronoun). The term *controls* here means that the preposition establishes the case of the noun or pronoun (in some other languages, certain prepositions control or govern an accusative noun/pronoun and others a dative noun/pronoun). In the English language, those pronouns, which hold distinct case forms often, present the accusative after prepositions.

Prepositions are regarded as heads of phrases, phrases equivalent to those headed by nouns, verbs, adjectives, and adverbs. This is a change of concept which points to a significant increase in the list of words included in the category of prepositions.

When prepositions lead to the construction of head phrases, these are recognised to be similar in structure to those headed by nouns, verbs, adjectives, and adverbs. A new look at what words pertain to in a category is necessary. Considering this structure, there are distinctions of phrases in order to include a set of words in addition to those that are traditionally determined as prepositions.

Nouns and pronouns (NPs) do not only appear after prepositions, but also prepositional phrases (PP), adverbial phrases (AdvP), interrogative clauses and adjectival phrases (AdjP). This is in contrast to the usual definition for *preposition* in dictionaries and traditional grammars. For instance (Huddleston & Pullum, 2002: 599):

- *The magician emerged (from behind the curtain).* (PP)
- *I didn't know about it (until recently).* (AdvP)

- *We can't agree (on whether we should call in the police).* (interrogative clause)
- *They took me (for dead).* (AdjP)

In traditional grammar, it is accepted that there can be PP, AdvP, or AdjP complements of prepositions. However, they do not allow declarative content clauses. A word equivalent to a preposition and taking a complement of a declarative content is basically analysed as a *subordinate conjunction*:

- *I remember the accident / He left after the accident*. (NP complement)
- *I remember you promised to help / He left after you promised to help*. (Declarative complement)

Nouns do not usually come with an NP as an internal complement, except on very few occasions since the NP is connected with the head noun by a preposition. For instance, the clause *they destroyed the city* is connected with the NP *their destruction of the city*. Here the NP *the city* is connected with the noun *destruction* through the preposition *of*. Adjectives function in the same way as in the following phrases: *proud of her achievements, keen on opera* and *very pleased with yourself.* Otherwise, many verbs take NPs as internal complements. Other verb phrases take a PP complement highlighted by a grammaticised preposition: *it depends on the weather; I owe everything to her.*

Thus, the traditional definition contains these grammaticised uses quite appropriately. The grammaticised uses of *by, of* and *with* from the examples above, for instance, may be compared with the non-grammaticised uses viewed in *I left the parcel by the back-door. That is of little importance. He's with Angela.*

Considering the position of the preposition relative to its complements, in the traditional definition, prepositions normally appear before the NP they govern. For example, one reason is that a small number of English prepositions can support the complement. An example of this exception is the preposition *notwithstanding* that means *in spite of* (*Notwithstanding the weather*: head + complement). This preposition may come in a different order (*the weather notwithstanding*: complement + head). Another reason is that the complement occurs in the initial part of the phrase in the clause and the preposition is consequently in an abandoned or last position. An example is the open interrogative *what are you looking at?* Traditionally, in canonical constructions, prepositions are always ahead of their complements.

Regarding the general definition (Huddleston & Pullum, 2002), the number of prepositions is smaller than the number of nouns, verbs, adjectives or adverbs. Even though new prepositions are added to the language on occasions, there is not a morphological process for developing them.

For instance, the most common preposition, *of*, comes from a prepositional meaning *away from*. Hence, this characteristic of prepositions together with the grammatical usage, supplies the general definition of the category (Huddleston & Pullum, 2002:

603): “Preposition: a relatively closed grammatically distinct class of words whose most central members characteristically express spatial relations or serve to mark various syntactic functions and semantic roles”.

In addition, the most relevant properties of prepositions in English are (Huddleston & Pullum, 2002):

- 1) Complements: the most central prepositions can take NP complements. Many prepositions permit some types of complements.

- 2) Functions: prepositions may head PPs as a function of non-predicative adjunct, and many of them may also head PPs as a function of complement.

- 3) Modifiers: a subclass of prepositions is identified as modifiers in such adverbs as *right* or *straight* (where both words directly carry the meaning).

1) Complements: a) NPs in traditional grammar, prepositions are seen as words taking NP complements. Adverbs do not take NP complements, but uniquely four adjectives do, in particular *worth, due, like and unlike.* The only words that contain NP complements are verbs and prepositions, and therefore, prepositions are normally identified from verbs by means of inflection and function. b) Non-expandable content clauses - when declarative content clauses do not allow the subordinator *that*, they are called non-expandable. For instance:

- *We left before the meeting ended* (non-expandable).
- *I'll come with you provided (that) it doesn't rain* (expandable).

c) Complementation in general: prepositions permit different kinds of complements, and verbs facilitate those subclasses. Most of these prepositions allow either an optional or an obligatory complement.

2) Functions: a) Non-predicative adjunct: one of the main characteristics that distinguish prepositions from adjectives is when PPs serve as an adjunct in a structure not in a predicative relation to the subject. For instance:

- *Ahead of the ship, there was a small island. Ahead of the ship, the captain saw an island on which to land (PP).*
- *Tired of the ship, the captain saw an island on which to land (AdjP).*

- The word *owing* may be classified as a preposition or as a gerund-particle. As a preposition *owing to*, that means *because of*, takes a *to phrase complement* and it is not predicative. *Owing to my stupid bank, there's no money for the rent (preposition).*

b) Complement: there are some cases where the complement is obligatory. For instance, *I put it in the drawer*. *He darted behind the curtain*. There are some transitive verbs

such as *put* or *place* and intransitive verbs such as *dart* or *slither*. Here they are the prototypical PPs containing preposition and NP complement. Another case where the complement is also obligatory is in clauses with the verb *to be*. E.g., *Jill is in the office*. *The proposal is without merit.*

3) Modifiers: there are adverbs such as *right* and *straight* whose functional sense appears clearly as modifiers of prepositions, but not with verbs, adverbs or adjectives. For instance, *they pushed it right under the bed. She went straight inside the house*. This modification is employed with prepositions identifying spatial or temporal relations.

In general terms, considering prepositions and adjectives, the following characteristics are provided:

- Prepositions may appear as head of a non-predicative adjunct in a clause structure.

- Central prepositions permit NP complements. Adjectives do not permit them.

- Central prepositions admit modifiers such as *right* and *straight*. Adjectives do not admit them.

- Prepositions, which have NP complements usually, occur with these complements in relative and interrogative structures. For instance, *the knife with which she cut it* or *I don't know to whom you are referring.*

- Central adjectives take modifiers of degree such as *very* and *too.* Prepositions do not take them.

- AdjPs may admit the verb to *become* as complement. PPs may not admit them.

In this section, the analysis of items and some cases of conversion between categories are considered (Huddleston & Pullum, 2002: 609):

The lexemes *near*, *close* and *far* pertain to both categories, prepositional uses and adjectival uses. The most common uses are prepositional uses. Regarding *near,* for example:

- *We should put it near/nearer the pool.*

- *This place is a dead end, but near/nearer the city, there's plenty going on.*

The meaning of *near* is locative, and the phrases as heads are distributed like locative PPs as *in the pool* or *beyond the city*. *Near* can also be frontal with the complements, that is to say in other words that *near* can be placed directly in front of the complements (*the tree near which we had parked*). Moreover, *right* as modifier is admitted (*we found it right near the house*). In terms of grading, however, *near* functions as an adjective, and can be modified by *very* and *too* (*you have put it very/too near the pool*).

The same structure applies to *close* and *far,* but the complement of the NP is not admitted with these prepositions. Thus, *near* takes a complement, either with an NP or a

to phrase, *close* takes a *to* phrase only, and *far* takes a *from* phrase only. The following table 3 shows the summary of these prepositional uses and adjectival uses of *near, close* and *far*.

Near - complement (NP or *to* phrase)
Close - no NP complement, *to* phrase only
Far - no NP complement, *from* phrase only

Table 3: near, close and far (Based on: Huddleston & Pullum, 2002: 609)

Considering prepositions and verbs, verbs are indeed distinguished from prepositions by their ability to appear as head of the main clause and by their ability to be used in different inflexions or tenses. For example (Huddleston & Pullum, 2002: 610):

- *There are five of them counting/including the driver.*

- *Pertaining to the contract negotiations, there is nothing to report.*

- *Given his age, a shorter prison sentence is appropriate.*

In the analysis of sentences, here the underlined words above are prepositions (*counting/including, pertaining or given*) since there is no identified subject. The same criterion applies for the classification of prepositions and adjectives in the following cases: prepositions can occur in an adjunct function without a predicate or verbal phrase. For example, a sentence with the verb phrase (meaning that this phrase is predicated) uses the verb *counting (counting his money before going to bed last night).*

For example, the boundary between a preposition structure and a verbal structure is identified (Huddleston & Pullum, 2002: 611):

- *Turning now to sales, there are very optimistic signs.*

- *Bearing in mind the competitive environment, this is a creditable result.*

- *Having said that, it must be admitted that the new plan also has advantages.*

Syntactically, these verbs (*turning, bearing or having*) are identified as subjects and are dependent structures as in inflected verb forms (verb tense structures). These verbs are distinguished from prepositions in that there is still an identified subject in the context, such as the speaker or addressee together. Thus, the examples of prepositions above have no subject: *counting/including, pertaining or given,* and the examples of verbs above are with subject: *turning, bearing or having*.

Concerning prepositions and adverbs, adverbs are described as words that modify adjectives, verbs or other adverbs. Within the framework of adverbs, the elements which modify a verb are called adjuncts. Most semantic types of adjunct have a phrase with an adverb or a preposition as the head.

In these sentences, the first underlined word is an adverb, and the second one is a preposition (Huddleston & Pullum, 2002: 612):

- *She did it carefully/ with great care.* (manner)

- *They communicate electronically/ by email.* (means)

- *They live locally/ in the vicinity.* (spatial location)

- *I haven' t seen her recently/ since August.* (temporal location)

Hence, words not requiring dependent elements are identified as a complete phrase:

- Prepositions do not necessarily take NP complements. When the case allows prepositions with no complements, it is compelling where the same words appear without or with an NP complement, as in *the owner is not in the house, the owner is not in*. Here, the preposition *in* belongs to the same category in both sentences. The relation is equivalent to that with verbs, adjectives or nouns.

- Identifying spatial terms, there are words (verbs or prepositions) which do not permit NP complements, but there are a number of spatial domains in which goal complements appear with verbs such as *come, go,* and also another locative complement to *be* (*They went ashore. They are ashore*). Here the adverb *ashore* does not modify the verb, instead for example, there is a modification having *young* as in *they are young.* In a clause, prototypical adverbs normally function as an adjunct in lieu of as a complement function. However, there are exceptions with examples of complements (*they treat us appallingly*).

Considering words with PP-complements, these words are classified as adverbs in traditional grammar, since the traditional definition of prepositions does not present the NP as complement. Concretely, a *complex preposition* is a combination of an adverb and a preposition. For example, *out of* or *owing to* are analysed as prepositions. However, the sequences of adverb and preposition appear in the following examples of *according to, because of, or instead of* (Huddleston & Pullum, 2002: 616):

- *Everything has been badly delayed owing to a computer failure.*

- *According to Kim, most of the signatures were forged.*

- *She suddenly jumped out of the window.*

- *We had to cancel the match because of the weather.*

- *They gave me a knife instead of a fork.*

Here *owing to* and *out of* are assigned as prepositions, but *according to*, *because of*, and *instead of* are assigned as adverb + preposition, which is called a complex preposition.

In short, grammar prepositions function as heads of phrases that allow a complement phrase. There are functional differences between PPs and AdvPs. The syntactic distinction between prepositions and adverbs refers to complementation. Many prepositions permit an obligatory or optional complement, with only a handful of exceptions, and these cases belong to the spatial domain.

On the other hand, adverbs typically occur without a complement, none of them admits obligatory complements, and most of them do not even take optional ones. The adverbs which permit a complement also contain the *-ly* suffix, as in *the lawsuit was filed simultaneously with the consent decree*, and these words can be assigned to the adverb category.

Within the realm of grammaticised prepositions (Huddleston & Pullum, 2002: 647), some have specific syntactic roles that are not defined by their meanings, and these have become grammaticised. When a formal lexical item carries meaning, it is not grammaticised. When a preposition takes a formal meaning and is not dependent on anything else for its identity, it is not grammaticised. An example of this is the preposition *under* which is not grammaticised and carries its own meaning. In some contexts where this preposition is acceptable, others can also be used with different meanings. Each preposition in the examples is not substitutable for the other in the same scene (e.g., *put it under the table. Put it above the table. Put it near the table).*

Considering meanings of prototypical prepositions (Huddleston & Pullum, 2002: 647-650), most of the central English prepositions have meanings in a location. These refer to either spatial location, change of location, notions within the dimension of time, or notions derived from these through metaphor.

In spatial relationships, Huddleston & Pullum also mention the concept of LM as the reference point or area; these landmarks usually are physical objects or places, points or regions in space, or also something represented metaphorically. The concept of trajector is defined as the item whose movement or location is detailed. These trajectors can be abstract, physical, or even states or events.

Thus, the location and a change of location are also referred. While this example gives a location, *Kim is at the supermarket*, another example points to a change of location *Kim walked from the post-office to the supermarket*. This change of location presents an initial point and a final point. In other words, a source assigns *from* to itself, and a goal assigns *to*.

There is also evidence that *at* includes the notion of path. The sentence *the cyclists are at Dijon* would only be natural as one of many points on a journey, for example, the Tour de France. Otherwise, the size of a city in connection with the group of cyclists

would make it natural to perceive *Dijon* as a container rather than as a point as in *they took this photo when they were in Dijon.*

In addition, the syntactic uses of the main grammaticised prepositions in English are described with their semantic roots where this is possible (Huddleston & Pullum, 2002). Some of them are: *as, than, at, by for, from, in, of, on, to,* and *with*.

According to Huddleston & Pullum (2002: 653-656), the lexical meaning of *at* presents a location in a particular geographical position seen as a point. This meaning can be perceived as the movement of a TR (*the truck was coming right at me*) or the point where a path joins with a non-parallel line (*we were stopped at the Albanian border*). Additionally, metaphorically, a temporal meaning, with the progress of time as a one-dimensional line, is used for exact times to point at specific measures of space (*at three o'clock*).

Another grammaticised preposition is *by,* which has a locative meaning formulating proximity (*by the wall*), a dynamic variation of motion past a point (*many people passed by*), and a temporal variation of the most recent (*time was passing by).*

In fact, various meanings are technique or instrument (*by hand, by unscrewing*), cause (*do something by mistake*), transport (*by car, by boat*), or route of access (*they came in by the window*).

Additionally, other meanings are also considered: in comparisons (*we won the game by two points*), time deadlines (*be here by ten o'clock*), in multiplication and measurement (*the problems had been multiplied by two*. *Our room is twenty feet by thirty feet*), in selling (*sold by the pound*), or identification marks (*I recognised him by his hair*).

In lexical and idiomatic meanings, the preposition *by* heads complements in passive clauses and in NPs. For instance, *the plan was approved by the boss.* In these clausal constructions, *by* points to the complement of the passive, being equivalent to the subject of the active voice (*the boss approved the plan).* In the NP construction, *by* points to a complement with the semantic function of the agent.

2.5.2 Relational meanings

In traditional grammar and in the Aristotelian tradition, the category of prepositions was described as link-words, that is to say, links between other words. This category of link-words has the same effect as articles, determiners and conjunctions. The first grammarian, who considered them as distinct classes, was Dionysios Thrax. A category that is a distinct part of speech was defined by this grammarian as follows: *a part of speech placed before other words in composition and in syntax*. That concept originated from the Latin term *praepositio* used in many modern languages (Navarro i Ferrando, 1998: 20-21).

In general terms, a preposition denotes a connection between two entities. One of them is presented by the prepositional complement and the other by another word (a verb, a noun or an adjective). This prepositional complement is characterised by a noun phrase, a nominal *-ing* clause, or a nominal *wh*-clause (Quirk, Greenbaum, Leach & Svartvik, 1985: 657-660).

The similarity between prepositions and other word categories or structures in English grammar is seen in several points. These points are in conjunctions, adverbs, particles, and adjectives. *Central prepositions* can be defined with three patterns which cannot have a complement (*that*-clause, an infinitive clause or a subjective case form of a personal pronoun).

These *that*-clauses and infinitive clauses do not appear as prepositional complements in English. For instance, *he was surprised that she noticed him. He was surprised to see her. He was surprised at her. They convinced him of the need for more troops.* These prepositions normally occur with certain adjectives, and verbs are omitted before a *that*-clause or an infinitive clause.

Further structures with verbs and adjectives which can occur either with prepositions or *that*-clauses are: *ask (for), decide (on), inform (of), be aware (of), tell (about/of), be bad (at), or be interested (in).* In some phrases, a preposition is needed to complement the sentence; for instance, some structures other than *that*-clause or infinitive clause are required, as *I'm looking forward to meeting you. I'm looking forward to the meeting with you. I'm looking forward to what you will say.*

However, *that*-clauses can often be included in prepositional complements through a construction with the noun *fact*, often in a clumsy explanation because it employs more words than are necessary: *they convinced him of the fact that they needed more troops.*

Considering the various types of relational meaning (Quirk et al., 1985: 673-675), the easiest types to describe are space and time. Other types of instrument and cause may also be identified, even though these are difficult to mark with a label. Some prepositional clauses may be illustrated best by connecting a preposition with the related clause itself.

On the subject of prepositions denoting spatial relations, dimension is one of these relations which needs to be clarified. A preposition is utilised to exemplify spaces in relation to the dimensional features, either objectively or subjectively of the location applied. For instance, *my car is at the cottage*. Here the prepositional use indicates a point in relation to the position of the car, and indicates a dimensionless location.

Accordingly, these prepositional phrases of place can be either adjuncts (event or states referring to a location) or postmodifiers (some objects referring to a location). In these notions a normal position (a fixed location) and a destination (a movement) have a relation named cause and effect (Quirk et al., 1985: 675).

For instance, as a destination: *Ann went to Oxford. Ann climbed onto the roof. Ann dived into the water*.

For instance, a position (as a result): *Ann was at Oxford. Ann was on the roof. Ann was in the water*.

The position point can be applied with verbs indicating state such as *be, stand* or *live*. Otherwise, the destination positions are typically accompanied by a dynamic verb such as *go, move* or *fly*.

In some cases, the prepositions *on* and *in* are sometimes used for both a fixed position and a destination. For instance, *she fell on the floor. He put his hands in his pockets.*

Therefore, here some types of dimension are considered (Quirk et al., 1985: 675-676):

Dimension-type 0:

At the bus stop, at the North Pole, at the end of the road.

Dimension-type 1 and 2:

Line: *the city is situated on the River Thames. The city is situated on the boundary. The city is situated on the coast*.

Surface: *a notice was pasted on the wall. A notice was pasted on the ceiling. A notice was pasted on my back.*

Dimension-type 2 and 3:

Area: *in the world, in the village, in a park*.

Volume: *in a box, in the bathroom, in the cathedral*.

The preposition *on* is used with a noun to determine a surface and, the preposition *in* is used with a noun to determine an area or containment. Some samples are: *she was sitting on the grass* (surface, the grass is short). *She was sitting in the grass* (volume, the grass is long). For villages or towns, *in* or *at* are used as points of reference, such as *he works in London, but lives in the country* (a large city, as an area). *Our plane refuelled at London on its way from New York to Moscow* (a large city, as a point on the map when this is a global distance).

When talking about a student at university or any other level of education, *at* is used in this context within a sentence, and when someone is in the city as a visitor, *in* is used instead. For instance, *she's at Oxford University. She's in Oxford*. Furthermore, these contexts indicate buildings, here *at* refers to a building itself in its functional characteristic, whereas *in* refers to a three-dimensional construction, such as *Ann works at a publishing house or Ann works in a publishing house* (Quirk et al., 1985: 676-677).

Other prepositions which denote space are *by, beside* or *near*. *Beside* is usually a locative preposition and *besides* a no locative preposition or adverb. For instance, *he was standing by/beside the door* (at the side of). *Beside Mary there stood a young man* (at the side of). *Besides Mary there were several other students in the hall* (in addition to). Furthermore, as a locative preposition, the preposition *near* with the meaning of *close to* can be substituted by *near to*, as *she was sitting near (to) me*. The only prepositions which inflect or conjugate for comparison are *near to* and *close to*, as *she was sitting nearer to me*.

On the subject of verbs incorporating prepositional meanings (Quirk et al., 1985: 687-692), when a verb functions without a preposition, it carries meaning directly related to the verb only and, when a preposition is added to that verb, a change of meaning may arise. Then, the verb becomes transitive, and the prepositional complement is a direct and locative object, as *climb (up) a mountain*, or *cross (over) a street*. Although in many cases there is a certain difference between these two phrases, the structure with preposition refers to the process, whereas the structure with direct object refers to a perfective aspect of meaning. For instance, *let's swim across the river. She was the first woman to swim the channel*.

Moreover, abstract meanings are expressed by many prepositions of place, which are related to metaphorical expressions, as *in deep water* (meaning to be in trouble). In temporal uses of prepositions, there are two dimension-types in the time sphere, a point of time and a period of time. Other examples of *at* for time and as idiomatic phrases for holiday reports are: *at ten o'clock, at noon, at Easter*, or *at the weekend*.

Also *by* occurs in the idioms *by day* or *by night*, where it substitutes for *during* as in *during the day* or *during the night*, as *we preferred travelling by night/ during the night*. Then, *by* refers to the result of an existence event, such as *your papers are to be handed in by next week* (not later than). *She should be back by now* (but I am not sure). When *by* also specifies an end point, *still*, *yet*, or *already* are significantly related, such as in, *by the time we'd walked five miles, he was already exhausted*.

Considering instrument and agentive in sentences (Quirk et al., 1985: 700-701; 711-712), the agentive is presented with a *by*-phrase. However, the agent is often omitted. For instance, *the window had been broken with a stone by someone. The window had been broken with a stone*. The agentive is usually animate and people who create cause, or in some occasions inanimate objects (nouns) such as *the crops have been ruined by frost.* The instrument may be denoted with a *by*-phrase such as *my car had been damaged by the branch of a tree.* In the interpretation of this sentence, human agency is excluded, but the natural result of a storm may have caused the damage.

The *by*-phrase is also used to express authorship. For instance, *a picture by Degas* (painted by Degas); *a novel by Tolstoy* (written by Tolstoy). Thus, a distinction may occur between agentive (animate who causes the action indicated by the verb), and instrument (usually inanimate) that an agentive makes use of it to do an action. An agentive and an instrument may indicate the role of agency.

Abstract stimulus and emotions may be shown by the preposition *at* and the instrumental *by*. For example, *I was alarmed at/by his behaviour*. The passive voice indicates that his behaviour alarmed me. In order to specify the meaning of a noun or adjective, the use of *at* is seen in sentences, such as *he is good/brilliant/expert at organising things.* An emotion indicating a reaction using the passive voice with *at* or *by* occurs in: *I was surprised by their rejection of the offer. I was surprised at their rejection of the offer*. The active construction of subject, verb and object is denoted as *their rejection of the offer surprised me.*

With reference to free and bound prepositions (Biber, 1999: 74), prepositions are connections that present prepositional phrases. A distinction can be made between free and bound concepts. Free prepositions indicate that the meaning is not dependent on any other word, whereas bound prepositions indicate that the meaning is dependent on some other word, such as the previous verb.

Although prepositions may be both free and bound in some cases, most of the uses of prepositions are usually free (Biber, 1999: 74). For example, free prepositions are:

Late one morning in June, in the thirsty-first year of his life, a message was brought to Michael as he raked leaves in De Waal Park.

For example, verb + preposition structures are called prepositional verbs, such as *confide in* or *rely on*. Some bound prepositions are:

She confided in him above all others.

The calculations generally rely on an after-tax rate of return of 8% annually.

Therefore, prepositions are defined as relational words, so that which words are related in a sentence (Brala, 2000). The easiest expression uses three components: the preposition and two noun phrases (NP). For instance, a phrase is *the spider on the wall.* The first noun phrase is named *spatial entity, located entity* or *located object*, and the second noun phrase is named *landmark, reference object* or *reference entity*. These two noun phrases are often named figure and ground.

In view of perceiving or understanding the meaning of prepositions, for example, Takahashi (2016: 1236-1244) explains the perception of space through prepositions in the book *An Adventure in English Language Space*. Understanding their correct usage to gain mastery over the different uses also involves a study of geometrical concepts, but few learners can attain this mastery because of the inadequacy of teaching materials that do not provide access to the logical functions, the geometry of space and the functional relationships between the participants.

In traditional grammar (Huddleston & Pullum, 2002), the definition of prepositions is words that express a relation to another word without specifying a meaning by themselves. The grammar textbooks have never explained the variety of meanings, and have taken little account of the relations with other elements and the uses in context.

According to Navarro i Ferrando (1998: 1-2) and O'Dowd (1998: 7-8), prepositions express lexical meaning in distinct senses. Prepositions may complement verbs, nouns or adjectives and add meaning in a context.

Adding to the notion of senses of prepositions, Hart (2004) distinguishes some senses of the preposition *in*, relating to the location point, the vantage point, the exterior vantage point, the segmentation or the reflexivity point:

- Proto-scene: spatial relation where a TR is situated around an LM. This LM has three points, namely, a boundary, an interior and an exterior. These points have force-dynamics and geometric properties connected with the functional aspect of containment, in the case of *in*, as well as extra-geometric aspects of location control. In order to clarify the noun *containment*, the meaning is *the act of controlling or limiting something or someone harmful* (Cambridge Dictionary online).

In the location point, Hart (2004) distinguishes:

- The in situ sense: in these examples the TR continues to be in a particular location within the boundary of the LM for a period of time. The LM is the boundary within which the TR is located. For example, *he stayed in for the evening*. Here the meaning is the TR is located in the LM in or within the home.

- The state sense: this sense refers to the emotional states associated with locations. An example of this emotion is the moment when a child can experience a feeling of love for his parents. Some authors (Lakoff, 1987; Johnson, 1987) use the metaphor of an emotion being a container, such as *to be in love*. Here the LM becomes the controller of the action of feeling and therefore becomes a container, a TR, itself.

- The activity sense: the difference between *in* or *on* refers to an activity that is considered to be in spatial relations. For example, *Henman is on court now*. Here the meaning is to choose tennis. *He works in finance*. Here the LM means to be in employment.

- The means sense: this sense refers to a finished activity or task in a functional nature of being contained. For example, *he wrote in ink*. Here the activity of writing is finished.

In the vantage point, some senses are detailed:

- The perceptual accessibility sense: this sense refers to an observer who is located within the interior of a scene, and is in the containment of the LM. For example, *the plane is in view*. Here the relation between the TR, an observer, and the LM is one of containment.

- The arrival sense: all senses of *in* are not static senses. This sense refers to the movement towards the direction of the interior of an LM from the exterior (a motion sense) to the interior (a static sense). For example, *the train is now in*. Here the train is in the interior of the train station, the LM, and this sense of *in* means a change from a motion sense to a static sense.

In the vantage point with an exterior observer, a sense occurs:

- The disappearance sense refers to a TR in an interior part of an LM that is not visible. For example, *the wine soaked in*. Here the TR disappears into the LM.

In segmentation, some senses are detailed:

- The shape as boundary sense: this sense refers to the shape of a boundary that is assigned to an LM. For example, *put the chairs in a circle.* Here this LM means to be in a formed circular shape.

- The blockage sense: this sense refers to an obstacle which prevents a TR from moving over the border of an LM. This obstacle is seen as a boundary element which limits or restricts an LM. For example, *we were snowed in.* Here the obstacle is the snow which causes a limitation of movement.

In the reflexivity point, a sense is proposed:

- The reflexive sense refers to an area indicated by a boundary of the including LM. This TR is within the interior of the LM. For example, *the walls of the castle fell in*. Here the walls are in the boundary of the LM.

Table 4 shows a summary of *2.5.2 Relational meanings*:

A position (a fixed location) and a destination (a movement) have a relation named cause and effect in sentences. For example (Quirk et al., 1985: 675), *Ann went to Oxford* (destination). *Ann was at Oxford* (position).
The structure with preposition refers to the process, whereas the structure with direct object refers to a perfective aspect of meaning. For example, *let's swim across the river* (Quirk et al., 1985: 687-692).
Free and bound prepositions: free prepositions indicate that the meaning is not dependent on any other word, whereas by contrast bound prepositions indicate that the meaning is dependent on some other word such as the previous verb (Biber, 1999: 74).
Understanding the correct usage of prepositions also involves a study of geometrical concepts (Takahashi, 2016: 1236-1244).

Prepositions may complement verbs, nouns or adjectives and add meaning in a context. Then, prepositional meanings are included in sentences, so that prepositions have their own meanings and distinct senses (Navarro i Ferrando, 1998: 1-2 and O'Dowd, 1998: 7-8).

Table 4. Summary of prepositional meanings

2.6 Frames of reference

In this section, some concepts underlying the language of space, such as the relative, intrinsic and absolute frames of reference, are illustrated with examples. Then, the definitions of deixis and the concept of asymmetry are introduced.

A reflexion on the use of language and cognition with a mention of space is necessary. Levinson (2004) analyses the concept of space and other concepts used to refer to space in *Space in Language and cognition.* Language and cognition are firmly connected in communication. In the 1960s, the nature of language, grammar and human cognition (being the process of perception) were differentiated at the beginning of cognitive science (Zlatev, Andrén, Johansson Falck & Lundmark, 2009: 2). Afterwards, the study of language was observed apart from cognition by new researchers. Associations (e.g., *The Swedish Association for language and Cognition*) aroused particular interest in language and cognition. Since then, language has not been studied separate from cognition, but founded on cognition, which includes the process of perception.

Cognition is approached from two viewpoints: the *cognitivist answer* and the *enactivist answer*. The *enactivist* is what Varela, Thompson & Rosch (2017) indicate in opposing Dennett (1993). From *the cognitivist answer*, cognition is knowledge in progress involving symbols as in a calculation process with functional and physical elements. The cognitive system functions appropriately when the symbols represent the real world. From *the enactivist answer*, cognition is enaction that is a representation or a performance, since it is related to the verb *enact* that means to represent and to perform. An organised connection represents the world through different levels and sublevels. The cognitive system operates appropriately when it forms a part of the natural world or forms a new view of the world through its historical evolution.

Initially, to specify the location of a thing, the different conceptual domains for a static location are, according to Levinson (2004: 66-75):

- The three major frames of reference or coordinate systems in language and cognition are intrinsic, relative and absolute. Most languages have special expressions and constructions for each frame. English, however, may be ambiguous, as in *the dog is in front of the truck.* This is an example of a relative system evolving from an intrinsic system. In related phrases (*at the truck's front)* the ambiguity disappears.

- In the vertical dimension, the three frames of reference, intrinsic, relative and absolute, coincide in a fly hovering *above a bottle*. The fly is in line with the top of the bottle (intrinsic), it is above the bottle from the visual point (relative), and the fly is higher in the axis by gravity (absolute). In short, the intrinsic frame is the canonical position of objects, the relative frame is the perception from a viewpoint, and the gravity axis defines the absolute frame.

- In the first locative class, there is no coordinate system or angular specification employed to indicate the figure's location with respect to the ground.

- The figure is said to be in coincidence with, contiguous to, proximate to the ground object or even some part of it.

- In the case of placements, the figure is located at the ground location. For instance, *the tournament is at Wimbledon.*

- Deixis: where the figure is located relative to the ground in terms of categories related to a radius (*here*, *there*) or a pointing gesture (*there* as a point).

- Contiguity or topology: where the figure is contiguous to the ground. Topology refers to the sort of domain covered by English prepositions *in, on, at, near* or *between*. These refer to the notions of containment, contact, coincidence, contiguity and proximity. As in *near*, this domain can be considered as spatial coincidence or approximation.

- Deictic specification provides a non-angular spatial location as in *it is here*, and often involves locative constructions. This specifies a goal and not a direction with motion verbs such as *he comes here*.

- In fact, deixis is a way of giving and highlighting a special kind of ground or LM in contiguity with the object to be located (see table 6 below).

- Another strategy is to use a coordinate system, where a ground object is chosen from the figure, a domain from the ground by pointing out an angle from the LM as in *the orange is to the left of the bowl*.

- The frame of reference can define a vertical or horizontal direction. In horizontal directions, it is termed intrinsic, relative or absolute.

- In the motion sub-domains, motion description and depiction can be involved: deixis (*come here!*), frames of reference (*move to the left!*) or even topology (*put it inside the bowl!*).

- Frames of reference are defined in terms of coordinate systems (associated reference points), and some topological relations are considered without angular or coordinate information (for example, by the use of the prepositions *at* or *near*).

- A proper analysis of topological notions involves the features of non-coordinate spatial information and the features of information spread through frames of reference. For instance, *the money in the piggy-bank* is a topological notion based on belongings of the ground object. *The dust under the rug* is also a topological notion, the frame is intrinsic (object-centred), the dust is on the bottom or under-surface (a carpet or rug), an absolute or complete information, and the object is in a vertical orientation.

- In the horizontal perspective (Levinson, 2004), the conceptual puzzle defines angles that can project onto a ground object. Levinson answers this puzzle by describing three frames of reference (see table 5 below). Firstly, the intrinsic system is projected out by a domain from a named side of an LM object. Secondly, the observer's axes describe the relative system, and these axes are mapped onto the ground object and are named angles. Finally, the absolute system uses a fixed set of sides and axes to define a direction from a ground object.

The following tables show the three frames of reference and the definition of deixis and deictic:

HORIZONTAL DIRECTION		
INTRINSIC	RELATIVE	ABSOLUTE
A canonical position. Described: a domain from a named side of a landmark object.	A perception from a viewpoint. Described: the observer's axes mapped onto the ground object which are named angles.	The gravity axis. Described: a fixed set of sides and axes for defining a direction from a ground object.

Table 5: frames of reference (based on: Levinson 2004: 76)

The definition of deixis and deictic	
The noun *deixis* (Cambridge dictionary online)	The use of a word or phrase whose meaning depends on who is talking, who they are talking to, where they are, etc., for example ‘me’, ‘here’, or ‘yesterday’
The noun *deixis* (Oxford English dictionary	The function or use of deictic words or expressions (= ones whose meaning

online)	depends on where, when or by whom they are used)
The adjective *deictic* (Cambridge dictionary online)	Relating to a word or phrase whose meaning depends on who is talking, who they are talking to, where they are, etc., for example 'me' and 'here'
The adjective *deictic* (Oxford English dictionary online)	Relating to a word or an expression whose meaning depends on who says it, where they are, who they are talking to, etc., for example 'you', 'me', 'here', 'next week'

Table 6: deixis and deictic (source: Cambridge dictionary and Oxford English dictionary online)

The coordinate system is operated by an axial geometry and an analysis of shapes together with a human use and orientation. Thus, the face, the back, and the nose of an object are designated by its orientation, its use in the scenario or any viewing angle.

The three main ways to designate asymmetries are:

- Using a fixed protective covering with an orientation of gravity, and thus when the object is on the ground, a bottom, top or even sides appear as the frontal side in *the statue in front of the town hall*.

- Using the axial geometry of the ground object to designate major axes and minor axes (the lines used to figure the position of a point) expressed apropos of the vocabulary of dimensions. A system of objects divided into parts, a classification and an analysis of voluminous belongings.

- Using of criteria with functions, the canonical orientation in particular, the functional orientation such as the fronts of buildings, directions, functions of parts and motions.

The spatial uses are similarly a development from topological spatial uses (where the figure is said to be in a part of the ground) to the intrinsic coordinate system (where the figure is said to be in a large search-domain[3] schemed from a side of a ground). In the English language, every object part can be considered in topological constructions. For instance, *the man is at the door of the house*. Nevertheless, the intrinsic construction is dissimilar, since only some terms (front, back and sides) are used grammatically in terms of the intrinsic system grammatically. For instance, *the man is in front of the house* (Levinson, 2004: 80).

[3] Search-domain (Levinson, 2004: 64): also called search-region determines an area where entities may be found.

Thus, topological systems may be interchangeable with elements of intrinsic systems, and the relative system can enter into the intrinsic system at the margins of the scene. The interactions are possible within the absolute analytic system as a whole. Motion can also be described by the intrinsic frame of reference. For instance, *the truck is moving backwards*. Here, the intrinsic aspects are assigned to indicate directional characteristics of motion. When route directions are given, some locutions are usually used (*turn to the left, then take the next right, go forward*). This intrinsic system is one of the first systems children learn at the early stage of their language development.

Humans are often used to describe ground objects in terms of human body parts. Note the following sentence is a topological description, *the hat is on his head*, whereas *the door is in front of him* is an intrinsic description. *The door is to the left* is an intrinsic usage, stating that along the route the door is to the left of the addressee's body. However, in the sentence *the ball is left of the tree*, the tree is the ground, and there is no human body, then the frame of reference is relative because the location is not angular or does not have corners.

Why do languages and people have to develop coordinate systems? The relative systems are complex because of primary and secondary coordinate systems (Levinson, 2004: 89; Robinette, Feist & Kalish, 2010). The answer is that languages and people have to develop coordinate systems because the elements of the intrinsic systems are not enough when these intrinsic elements appear only in a scene. First, all LM objects do not offer sides within the intrinsic system. As a second option, relative systems relate to logical outcomes. For instance, the letter A is to the left of B, and B is situated to the left of C, and then A is also to the left of C. Here the logical explanation is a clear example of how to understand this system. Third, the visual point of view is combined in a direct way. In relative terms, a scene is viewed by the visual memory which provides all the information to describe the situation. Such a visual principle profoundly influences language's intrinsic and absolute vocabulary.

Essentially, the spatial descriptions of relative systems are thus classified as having a "subjective" point of view since these relative systems are built from a particular viewpoint (Levinson, 2004: 89). These descriptions are called deictic, although they do not have to be egocentric, and the speaker does not have to be the viewpoint. An example of this situation is: *it is to the left of the tree from where you are sitting*. The position adopted here is that the uses are dependent on other coordinate systems, that is to say, are dependent systems. In a viewpoint, they are just the deictic uses, which means the LMs do not have non-angular locations or corners (*here/it is to the left of the tree*). In addition, the static viewpoint limits the description of the situation. For example, long journeys or route directions are usually presented using intrinsic notions of left, right, front or back.

Moreover, another frame of reference is called absolute (Levinson, 2004: 90-92). The absolute frame of reference is used in many languages and speech communities to refer to fixed bearings or the absolute coordinates such as the cardinal directions of north,

south, west or east, which are abstract notions. These notions cannot be thought of as places of proximity or landmarks because when the movement of the sides is changed, the bearing would change too. There is a definition of parallel lines in the environment, and the obvious focal point is the solar compass to fix bearings. At this point, the setting and rising of the sun cannot determine these fixed bearings due to the variation of the solstice. Nevertheless, the sun moves in two dimensions continually, across the horizon and upwards, and both rates of movement are variable in each season.

Absolute systems describe an array of external bearings without using viewpoints. The local landmarks have some of the same properties as absolute systems. Many coordinate systems that use this terminology of local LM features are seen as abstract notions. In fact, these are directional references and are abstract in terms of hillsides, wind directions, river directions or coastal features. In angular descriptions and on the horizontal line, there are two points to consider. One of them is that this system does not take an egocentric or personal view apropos of setting the table as an example. The other one is that speakers and addressees must be oriented to the fixed bearings and this system would be learned by children earlier than relative expressions.

In the absolute system, the location specifications and the motion descriptions are detailed as natural. One of the features of absolute motion is that the specification of direction is allowed without any reference to landmarks, places or grounds. Thus, one can comment using expressions such as *ships sailing east*, *birds heading north*, *winds blowing west* without a reference to goals, which are often necessary for the description of motion events.

In general, speakers, rather than languages, use frames of reference. In fact, many linguistic expressions may accept more than one frame of reference, so that languages limit the frames of reference which are supplied in some usual expressions. The relevance of terminology in context can be seen in the terminology used by experts in comparison to that employed in the everyday use of language.

Therefore, the semantics of expressions within a language need to be distinguished from their conventional or everyday uses (Levinson, 2004: 90-94). Locutions are not provided by all languages and for all three frames of reference in an everyday conversation. In this scene, a question arises: what conceptual domains are considered natural, innate or universal in frames of reference? In specific frames of reference, sensory systems are adjusted to process information. Thus, vision also gives us information in a relative expression, but visual-object recognition may demand objects in an intrinsic frame of reference from this relative perspective. Similarly, the inner ears transmit information to us about a vertical position in a gravitational and absolute frame of reference.

At the cognitive level (Levinson, 2004: 90-94), topological concepts come before concepts of frames of reference, and the intrinsic frame of reference is learnt years before the relative frame of reference. The absolute frame of reference also shows a late acquisition in spatial concepts at around four years of age. The possible exception is the

intrinsic system, but none of the concepts from the frame of reference come from the natural stage or innate categories within the earliest years of language acquisition. Thus, the trajectory from this learning development holds the attention to understanding the cultural element of spatial cognition.

Kracht (2015) describes some aspects of space, frames of reference and the absolute space. The notion of *aspect* is used for spatial expressions which encode space. The constitution of space and its modification is needed for the explanation of notions. In the contrast between a static and a dynamic object, this refers to the sense of relative motion of the LM instead of the sense of *absolute* motion of the TR. Regarding space, there is a subjectivity bias of perception and science concerning the nature of space. The spatial expressions can be determined by a mental image schema that functions as a cognitive map or a model of the physical world.

Kracht (2015) uses the term *vector,* meaning *point*. There is a reference point in absolute space named absolute frame of reference whose location is fixed, such as rivers, trees, mountains, or winds. Other examples of the absolute frame are the sun or the stars, though in that case, their location changes over time. In the coordinate frame, the observer may use the cardinal directions and sides such as *north, south, east, west, left, right, front or back.* A representation may contain information about objects and the function encoded in these objects. Both the representation and the function can be shown in an effective determination. The absolute frame is seen from a distance point on a map instead of near. Scale is not significant when the term nearness is used from a point on a map.

The notion of frames of reference may be understood as places, locations, and places containing the objects. Aristotle mentions a clear example, the puzzle in which the river is the frame of reference in which a boat is moving (Levinson, 2004: 24-34; Robinette et al., 2010).

A variety of frames of reference can be used when sentences are formed. For instance, I lived near the school (Macmillan Online Dictionary), or *I will be away from home for two weeks* (Merriam Webster Online Dictionary). It is evident that the sense of distance depends on the LM and the speaker. Sometimes there is an ambiguity because of the position of the object and that of the LM (see section *2.4.1 the terms of trajector and landmark*).

Nevertheless, a question must be asked when position and spatial information are referring from a frame to another direction of movement. There are some distinctions between spatial frames of reference according to Levinson (2004: 24-34): the first is *relative* (regarding space as relations between objects) a subtype of which is *deictic* which depends on the visual perception, the second is *absolute* (directions in relations between objects), and the third is *intrinsic* which depends on the LM. Also, to be

considered are *viewer-centred, object-centred* and *environment-centred* which are centred on the speaker, the object or the environment respectively.

When *relative space* is considered, it refers to the egocentric coordinate system, and when *absolute space* is considered, it refers to non-egocentric ones. The distinction between *egocentric* and *allocentric* refers to the coordinate system centred within the subjective body frame (*egocentric*) and the second one (*allocentric*) centred elsewhere, the geographic orientation and it is not often specified (Levinson, 2004). Then, these terms are related to *body-centred* and *environment-centred* frames of reference. As philosophers have argued (Campbell, 1993: 65-95; quoted in Levinson, 2004: 29), the egocentric frame is connected to *body-centred*, a *speaker* and a *body-schema* in a spatial interaction. Levelt (1996) uses the term *deictic* to refer to the relative system, and the *perspective system* to refer to frame of reference.

Another distinction based on the theory of vision separates *viewer-centred* and *object-centred*. As Levinson (2004: 24-34) points out, this theory of vision is the process whereby a retinal image is formed by the recognition of an object itself, being seen from 2.5 D sketch to a model of 3D as a structural description. This distinction is related to the linguistic distinction between *deictic* and *intrinsic* perspectives. The *deictic* perspective would be the *viewer-centred*, while the *intrinsic* perspective would be the *object-centred*.

Indeed, there are also notions of orientation, called *orientation-bound* and *orientation-free*. The first orientation refers to both *absolute* and *relative* frames, while the second one, which is *orientation-free*, refers to *intrinsic* frames. In fact, linguists have identified *deictic* and *intrinsic* frames of reference. There are three different interpretations of *deictic* and *intrinsic* (Levinson, 2004): the first one is either *speaker-centric* and *non-speaker centric*. The second one is centred on any of the speech participants and non-centred (the participants or speakers are not in the central area or in the main site). The third one is ternary (involving three elements) and binary (involving two elements) spatial relations (Levelt, 1996: 77-108; quoted in Levinson, 2004: 30-34).

In a spatial representation system, the frame of reference is accepted for the coordination of perception and language. Thus, the deictic, intrinsic and extrinsic notions are related to the corresponding linguistic interpretations of viewer-centred, object-centred and environment-centred frames of reference. For instance, it is clear that *egocentric* refers to *relative* or *viewer-centred*, 2.5 D sketch refers to *deictic* frame, *intrinsic* corresponds to *object-centred* or 3D model, *absolute* corresponds to *environment-centred* interpretations.

Regarding frames of reference from a linguistic view, the notion of *absolute* as the frame of reference is used in many languages in referring to such concepts as fixed bearings (West, North). On the other hand, some European languages would use the notion of *relative* or *viewer-centred*, such as *left*. Essentially, the frames of reference termed *absolute, relative* and *intrinsic* are the main ones used in order to describe the horizontal spatial directions.

For instance, according to Levinson (2004: 35-37), some sentences are viewed as a *deictic* frame:

1. *The ball is in front of me. The ball is in front of the tree*. (Levinson, 2004). (As *speaker-centric*)

Then, regarding prepositions *near* and *away from*:

2. *I lived near the school* (Macmillan Online Dictionary) or *I will be away from home for two weeks* (Merriam Webster Online Dictionary). (As *speaker-centric*)

Other sentences are viewed as an *intrinsic* frame:

3. *The ball is in front of the chair*. (Levinson, 2004). (As *non-speaker-centric*, the chair)
4. *The ball is in front of you*. (Levinson, 2004). (As *non-speaker-centric*, the addressee)
5. *The ball is to the right of the lamp, from your point of view*. (Levinson, 2004). (As *non-speaker-centric*, the addressee)

Then, regarding prepositions *near* and *away from*:
6. *They are near to solving the puzzle. Keep away from the stove – it's very hot* (Macmillan Online Dictionary). (As *non-speaker-centric*, the addressee)

Since coordinate systems are frames of reference and, within a language, frames can be distinguished according to origins such as the speaker, the addressee, etc. Table 7 shows a classification of frames of reference (source: Levinson 2004: 55):

<table>
<tr><th>INTRINSIC</th><th>ABSOLUTE</th><th>RELATIVE</th></tr>
<tr><td>Origin ≠ ego</td><td>Origin ≠ ego</td><td>Origin = ego</td></tr>
<tr><td>Object-centred
Intrinsic-perspective
3D Model</td><td>Environment-centred</td><td>Viewer-centred
Deictic-perspective
2.5 D sketch</td></tr>
<tr><td colspan="2">Allocentric</td><td>Egocentric</td></tr>
<tr><td>Orientation-free</td><td colspan="2">Orientation-bound</td></tr>
</table>

Table 7: frames of reference (source: Levinson 2004: 55)

The main points regarding the three frames of reference are summarised in the following paragraphs (Levinson, 2004: 78-80)**:**

The intrinsic frame refers to *front/back/sides/lefts/rights*, and in some languages, speakers mention heads, horns, feet or roots. Then, the *front* or *back* of an object must be regarded. This frame focuses on the object-centred coordinate system. For instance, the *front* of a TV, or the *front* of a car, *the statue in front of the town hall* as the facet of a direction in order to extract a line or an angle. The primary reference point

corresponds to the LM, and angles or axis are devised on the grounds of its geometrical shape.

The relative frame refers to the perceiver's location, and a figure and a ground distinct from the viewer's point. Then, there are three points (the viewer, the figure, and the ground) to consider through the human body: up/down, back/front, or *left/right*. For instance, *the ball is to the left of the tree, Bill kicked the ball to the left of the goal.* The aspects of a relative frame are: the use of constructions with an object that does not have intrinsic parts, and including the three points mentioned above, the description of a scene varies when the viewer moves about the scene. An actual or imaginary viewpoint functions as a reference point and positions are devised from this viewpoint.

Referring to relative frames, in some cases, there is ambiguity about the notions of *left, right, front* or *back* in both frames of reference (relative and intrinsic). Depending on the expression, these directions are clarified in a syntactic aspect relating to sentence construction, such as *to the left of the chair* (relative) or *at the chair's left* (intrinsic). Thus, relative frames can mean an extension of an intrinsic frame and a derivation of intrinsic one. The primary coordinate system focuses on the viewer, and the secondary coordinate system focuses on the ground. These two systems are facilitated by polar rotation.

The absolute frame refers to the salient *slope*, and fixed directions of gravity, such as the orientation of *north, south, east* and *west,* related to compass bearings. These are also seen as canonical orientations, so they are standard or recognised orientations. For example, *a spoon in front of a cup* is understood as a spoon to the north of a cup without focusing on the viewer. Occasionally, the absolute frame may also present ambiguities because of sociocultural aspects, abstracted fixed bearings of landscapes or another aspect of relative interpretations.

Therefore, in the absolute frames some of these systems are abstractions from an environmental field such as inclinations of mountains, river drainages, the act of flowing out (water) or wind directions. Thus, the characteristics of absolute frames are: a binary relation involving two locations named a figure and a ground in a scene, and then a system of coordinates is presented as having fixed bearings. The *geocentric* frame presents the path in motion through the fixed cardinal positions.

In short, these three frames of reference can appear, including a deictic centre that is a relative subtype or may not include this one (Levinson, 2004: 78-80). In the intrinsic frame, in a scene such as *the ball is in front of m*e (deictic centre); in the absolute frame, in a scene such as *the ball is north of me* (deictic); in the relative frame, in a scene such as *the ball is in front of the tree*, here the location is understood as the position from where I am viewing the scene as the speaker of the sentence. Indeed, the absolute and the intrinsic frames involve binary relations whereas the relative frames involve ternary relations since a viewpoint is added continuously.

Coming to the end of this section, the unique direction where one may change frames is from the two orientation-bound frames (relative and absolute) to the orientation-free (intrinsic). In the case where the orientation of the object in ground is specified, one may derive an intrinsic frame. For example, in a relative description and specification *the chair is facing to my right* or *the bottle is to the right of the chair in the same plane;* in an intrinsic specification *the bottle is at the chair's front*; in an absolute specification *the chair is facing north* and *the bottle is to the north of the chair*. In some situations of representation and interpretation more than one frame of reference can be adopted.

2.7 Classification of accessibility

In this section, accessibility is introduced and illustrated with examples regarding the main entities of a location and its characteristics: the speed, the dimension, the size, the facility of access and the type of access. These characteristics are relevant for the interpretation of horizontal prepositions in a context.

According to Vandeloise (1991: 67-73), the norm or distance depends on the TR and the relation with the LM as well as the dimension of the LM, the speed of the target, the speed of the LM, the size of the speaker, the speed of the speaker, the size and the speed of the addressee, the facility of access and types of access too. Regarding the dimension of the LM, infrequently, the LM is smaller than the target. The norm or the model may increase in proportion to the LM. The distance between the target Jupiter and the LM may be greater in *Jupiter is near the Milky Way* than in *Jupiter is near Saturn***.**

Indeed, the target's speed (Vandeloise uses the term *target* for TR) is also relevant to interpreting the distance, since the norm may increase with the target's speed when moving towards the LM. For instance: *the tortoise is far from the lake*, or *the antelope is far from the lake*. The lake is seen further from the antelope than from the tortoise. However, when the target is moving away from the LM, the extension of the norm will diminish as speed decreases. In other words, when a target's speed is gathering an LM in an easier or more difficult way, the normal distance will increase or decrease, respectively.

Thus, the speed of the LM is not seen as a common context when the LM is mobile. However, there are some sentences in which the distance increases with the speed of the LM. For instance: *the man is far from the helicopter*. Here the LM is moving from the target. *The fox is near the rabbit*. Here it depends on the speed of the LM. There is an influence of the speed of the LM in contextualising or analysing the relationship between it and the target. Furthermore, another case is the size of the speaker. This could be near when there is a father or far when there is a child and the size depends on the speaker’s age.

Moreover, the speed of the speaker varies when the speaker is driving a car or this speaker is on foot. Similarly, the size of the addressee varies as the addressee moves

away from or towards the viewer, the addressee becomes smaller or bigger. And the speed of the addressee could vary when the addressee is a hiker, the hiker's speed may depend on whether s/he is lame or not, and for example, a farm is near from a village for a hiker, or this location of a farm is far from a village for a lame person.

Finally, the facility of access may be different when the path is easy or difficult to access, for example, when the distance increases or diminishes. For example, *the red house is far away*. Here, the speaker is walking up, and it is far away. *The yellow house is near*. When the speaker is walking down and it is near in such a case. There are types of access such as visual access and physical access. For example, if the speaker sees the mountain from the hotel window, it may be near or if the speaker wants to hike there, it may be far. Another situation is when a sailboat may be far from the visual access of the eyes, but it may be near through binocular. There is an assessment or evaluation of distance which is changed by the types of access of the speaker or target.

In fact, the access to arriving at the meeting point and the factors of making it easier or more difficult between the target and the LM play an important role in order to interpret the distance and the positions in a location. The main factors are pointed out below. Accessibility:

- relative speed of target and landmark
- distance
- type of access

The temporal sense is also used with the preposition *near*, which indicates the temporal reference. For example (Vandeloise, 1991: 67-73), *it is near Christmas*. In the domains of colour, terminology the expression *proche de* (close to) is preferred over *près de* (near). An example of this sense: *mauve is close to blue*.

Thus, is it not more direct to define prepositions concerning accessibility and inaccessibility? If so, the distance itself would be one of several possible factors which may affect the access.

2.8 A functional description of spatial prepositions

The function of prepositions is related to the study of geometry. Sections 2.8 and 2.9 are concerned with an explanation of the functional description of spatial prepositions, the functional feature, the language of space, the actions in space described with the concepts of geometry, the concept of topology in reference to the previous experience of the physical world and the semantic structure of prepositions including the comprehension of semantics in dictionaries. The examples of prepositions in French and their translation in English from Vandeloise (1991) are used in order to follow the study. At this point, I suggest taking into account the functionality of prepositions and the knowledge of geometry to understand the meaning of spatial prepositions.

What system best describes these spatial expressions? As a possible approach to this question, geometry and logic are suggested to describe these spatial expressions. Geometric space employs tools of spatial analyses, angles, straight line and measurements. A geometric representation pretends to be independent of context and speaker, and also of function objects positioned in space. When a speaker fixes an object in relation to the speaker, the origin of the system of reference is this speaker, and three intersecting axes are easily situated. The vertical, lateral and frontal directions are often needed to fill these roles. For instance, Vandeloise points out that in French the prepositions *devant/derrière* and *à gauche/à droite* are usually connected with the lateral and frontal directions, and these notions of geometry supply an incomplete description of spatial expressions (Vandeloise 1991: 3-5). For instance:

- *the bird is in front of the minister*
- *(l'oiseau est devant le ministre)*
- *the net is in front of the crab*
- *(le filet est devant le crabe)*

In these examples, the preposition *devant* is explained by the minister's line of sight and the crab's movement, and not by the frontal direction. Thus, the notion of orientation is exemplified in these contexts to develop the direction and the orientation. This concept of general orientation conducts the use of prepositions in French such as *devant/derrière*.

As for the language of space, a spatial preposition does not express absolute distance either. Concretely, any of the prepositions does not mean that the distance from object to subject is less than/larger than one meter. Vandeloise uses subject/target and object, meaning TR and LM. For instance, when the speaker says that the shop is *near* the bank, the distances exposed by this preposition depend on whether the speaker has the intention to travel by car or by foot.

Therefore, answering these issues of space representations (Vandeloise 1991: 5-6), the prepositions *près de/loin de* (*near/away from*) commonly appear in a function of a distance less than/greater than a defined norm. The factors involved in considering such a norm are the physical accessibility of subject or object and vice versa. As far as access is concerned, a question may be asked: are these prepositions *près de /loin de* defined by the notions of accessibility and inaccessibility? Indeed, the distance itself would be one of these factors determining accessibility.

Moreover, other geometrical notions are the object of the spatial relation and the number of its dimensions. For example, the English prepositions *at*, *on* and *in* are called one-, two- and three-dimensional applications of points of reference (Clark, 1973). The following examples present three uses of the preposition *à* in which objects have one, two or three dimensions (Vandeloise, 1991: 5-7):

- *the point is at the intersection of two lines*
- *(le point est à l'intersection des deux lignes)*
- *the priest is at the beach*
- *(le curé est à la plage)*
- *the minister is at the church*
- *(le ministre est à l'église)*

Generally, the preposition *à* (*at*) expresses a position of coincidence for a subject and an object. Since the priest and the minister do not coincide with the beach and the church, then, the subject and object of this preposition must be understood as a single point in space. One of the interpretations is by the geometrical inclination and its three dimensions. In such a case, a child or naive person may interpret the beach or the church as a place since a child does not understand the term dimension.

In addition, the object of the preposition *dans* can also be written in relation to one-, two- or three-dimensional objects (Vandeloise, 1991: 6-10). For instance*:*

- *the jewels are in the box*
- *(les bijoux sont dans la boîte)*
- *the cow is in the field*
- *(la vache est dans la prairie)*
- *the priest is in line*
- *(le curé est dans la file)*

The English preposition *in* represents the category of container, whose subject is contained by its object. Thus, three-dimensional objects are understood as appearing in a container with objects. In summary, entities may be understood to be in one, two or three dimensions in space, and objects also illustrate these possibilities (Vandeloise, 1991: 9-20). Dimensions are characterised by length, width and thickness. A speaker can consider a single object from several perspectives and, each one may change the importance of dimension. The notion of thickness depends on its strength or resistance and less on the object's volume. The thickness of an object may be considered to its density or its dimension.

Logical definitions may occur with selection restrictions, and an example is the subject/object relation with the prepositions *devant/derrière* in French. Logic simplifies the knowledge of spatial prepositions to a description of formal usage obtained from context. Besides, a functional description based on spatial words is connected to the linguistic knowledge of space assigned by speakers. Thereby some key notions to consider are: spatial location, container/contained relation, access to perception, contact and general or lateral orientation.

The function of spatial relations is to situate objects, and for example, the preposition *à* seems to appear in situations whose participants share knowledge of LM. Hence, the

target is situated so as to appear smaller, mobile and far from the visual field of speakers. Certain aspects are shared by speakers of the same language:

- The vertical direction is seen when a man stands up, a tree grows or a stone falls along an axis. This direction is indicated by the expressions *au-dessus/en dessous* (*above/below*).

- When an object supports or carries another object, this object is closer to the ground. For example, the relation of bearer/burden can be regarded in the prepositions *sur/sous* (*on/under*).

- When an object contains another object, this object is often hidden, and the influence is perceived by the shape and position of this object. The functional relation better regards the preposition *dans/hors de* (*in/outside*) than the topological relation of inclusion or exclusion.

The distribution of the French prepositions *derrière/sous* (behind/under) is considered in the accessibility of perception. These prepositions expose imperceptibility along the horizontal axis for *derrière* and along the vertical axis for *sous*. The preposition *sous* is derived from the accessibility to perception and the relation bearer/burden (Vandeloise, 1991: 16-17):

- *the fly is under the map of Mexico*
- *(la mouche est sous la carte du Mexique)*
- *the fly is behind the portrait of the pope*
- *(la mouche est derrière le portrait du pope)*

Furthermore, the use of space shows a potential encounter, and all our actions can be intended speaking of encounter. Encounter indicates movement, and this is the case with the verb *aller* (*to go*), which is a verb of encounter (Vandeloise, 1991: 17-19). As an alternative, the verb *venir* (*to come*) relates to two places of encounter (to come home from work). Additionally, other prepositions *avant/après* (*before/after*) have a potential encounter. For example, in the destination of two bikers, the closest biker to the point is said to be *before* the second biker, and these prepositions describe a relative potential movement.

The function of the human body and symmetry solve two directions, the lateral and general directions. These notions are used with the prepositions *devant/derrière (in front of/behind)* and *à gauche/à droite* (*right/left*). Thus, the principal characteristics of general orientation introduce the line of sight, the direction of movement and the frontal direction.

In conclusion, the distribution of spatial prepositions focuses on the following terms: localisation, which means the function of spatial relations to situate objects; physical accessibility and accessibility of perception, which are the faculties of perception of objects; potential encounter, which is explained by the use of space in movement; and

general or lateral orientation, which is determined by the symmetry and function of the human body.

In table 8, the terms of symmetry and asymmetry are defined:

Symmetry (Cambridge dictionary online)	-In mathematics: the quality of having two parts that match exactly, either when one half is like an image of the other half in a mirror, or when one part can take the place of another if it is turned 90° or 180°. -The state in which two parts, on either side of a dividing line, are equal in size, shape, and position.
Asymmetry (Cambridge dictionary online)	-With two halves, sides, or parts that are not exactly the same in shape and size.

Table 8: the definitions of symmetry and asymmetry (source: Cambridge dictionary online)

Such a difficulty in understanding prepositions is, no doubt, of interest to clarify some concepts about the language of space. Therefore, some concepts are pointed out along the same line about the functional features (Langacker, 2010).

The central notions of space, which are relevant to remember, are described by the following authors (Langacker, 2010): “a prototype (Lakoff, 1987), spatial scene (Tyler & Evans, 2003), conceptual schema (Navarro i Ferrando, 1998), and logical impetus (impulsion) (Vandeloise, 1991)”.

Furthermore, the following paragraphs introduce some concepts such as grouping, primary and secondary elements, a source domain, active realm, conceptual archetypes or target in order to understand the function in the language of space.

A physical object is a model for a prototype of nouns. Conceptual grouping and reification are indicated by a group of an entity for higher purposes. In the verb prototype, the two elements are agent and patient, which are subject and object essentially. These are named the primary and secondary focal elements.

At the level of abstraction, imaginative figures appear, such as metaphor, fictivity or blending (Langacker, 2010). In metaphor, a source domain is identified in the comprehension of a target domain (in that case, a container and its contents). The notion of fictive motion refers to a motion along a path in a space conceived within the mind. Some of the capacities are scanning, grouping, identification of a difference and sameness.

In human experience, the active realm is an action, force or motion, whereas the circumstantial realm is the localisation, setting or static scene. An activity of action, force or motion changes the circumstances of a static scene.

Conceptual archetypes are not seen as intrinsic but a fact of how these are comprehended in the world. For instance, one can paint, clean or even examine a room as a setting for interaction. In that case, an object is in a concrete location; the reason is that someone introduced this object into this location with a certain intention.

Each preposition indicates an area in a particular space, relating to an LM object, and then, a TR can be seen within, such as in the interior (*in*), an area adjacent to this TR (*beside*), in an approximate neighbourhood (*near*), and so on.

The appearance of new prepositions originating through grammar indicates that new distinctions are necessary to use them since prepositions have different meanings. Prepositions are placed between nouns and verbs. A noun indicates a thing, and a verb indicates a process.

The basic question is: could spatial prepositions be viewed as spatial or as a functional feature? Langacker (2010) does not suggest that an analysis of these points is essential. The salient point is to identify that spatial and interacting states are unified within each other. The alignment question is: is the positioning of entities such as TR and LM to be in a line and in an orientation? These entities could be in this positioning or in this alignment. The positioning can be either expected or unexpected. For example, *the kitten is in the box*. Here the orientation is expected because the function is containment. However, even when the function of the scene is expected or anticipated, the alignment of TR and LM may be still unexpected.

After abstracting from content, the formation of an idea is an outline of a path from a reference point to a search domain and then to localise a target here. The TR is viewed as a mover in a motion from a scene, although this TR does not move in all occasions. In the description of the TR's semantic function, Vandeloise (1991: 22-25) refers to the notion of the logical impetus for an entity not fixed in space. The alignment of spatial preposition holds an impetus in movement, in the principal functions of containment, support, finding or seeking basically. Thus, interaction and spatial features are combined, both of them are necessary to the description of prepositions, but the second one is first in order.

2.8.1 Actions in space by geometry, topology and our experience

Space is identified by geometry, topology and our experience (Vandeloise, 2006). The notions of geometry and topology refer to static scenes, whereas spatial experience refers to movements in a scene.

For instance, a painter who wants to paint a running antelope would wish an immobile scene to consider all details (Vandeloise, 2006). As a matter of fact, linguists also include immobile pictures to illustrate concepts of movement in topology and geometry in such a case. Pictures and static scenes do not include spatial indications of movement and forces. Habitually the immobility is the finding of equilibrium between forces, such as the two pans of a scale, where these two weights are in a state of balance.

The notion of *dynamic* is sometimes understood mistakenly as having the same meaning as the notion of *kinetic* (Vandeloise, 2006). However, this notion of *kinetic* is not a synonym of *dynamic* on all occasions. For example, regarding the force of gravity, the movement of a falling stone to a ball. Here the principle of inertia illustrates that an external force is not necessary to continue the movement of the ball. As far as force is concerned, when someone is walking in the street, there is not an exchange of force, but when someone is going up a wall, climbing a wall, in that case, there is an exchange of force. Thus, kinetics considers actual movements, and dynamics considers the association between efforts (force) and movements.

Vandeloise (2006) classifies four situations of actions in space: *static situations and kinetic situations with dynamic exchanges or without dynamic exchanges.*

1. Static situations without dynamic exchange: using *projective prepositions* to give instructions and to locate a concrete target. For example, *above, in front of* or *on the left side*. *The tree is on the left of the house*. The prepositions *above/below* are in the vertical axis, the prepositions *in front of/behind* are in the frontal orientation, and the prepositions *to the right/to the left* are in the lateral orientation.

2. Kinetic situations without dynamic exchange: using verbs of movement. For example, some verbs such as *to come, to go* or when illustrating a manner of movement, such as *to drive, to walk*. *John walks in front of the house.* There is not a dynamic exchange of forces. In those cases, an entity acts with energy, but this entity does not come up against an obstacle. Moreover, using *projective prepositions* in English and French, the target could be immobile or mobile. In English, *in* refers to a container, but *into* refers to a movement, but in contrast, in the French language, *dans* refers to scenes both of a container state and a movement.

3. Static situations with a dynamic exchange: as long as the scenes of balance concern the equilibrium of two forces from control scenes, there is not any preposition assigned to the relation of balance. Some cases of static exchanges of forces may, however, be symmetrical by *against* or the verb *to touch*. Asymmetrical relations may be indicated by *in*, *on* for containment and support or *hanging from* for suspension.

In such a case, the container commands the content. Along the vertical axis, the predominant entity interferes with the controlled entity in support and suspension. In support, the bearer or a person who carries something maintains the load from below, and in a suspension aspect, the dominion is exerted from below. According to the images, for instance, *a pear is on the table. A pear is touching the table. The pear is in*

the bowl. Here in the first example, the table controls the pear; in the second one, the pear depends on the attached string; and in the third one, the author refers to the position of the pear to be at the top of the bowl, but not inside, so that when someone takes the bowl, the pear will also be in motion.

4. Kinetic situations with dynamic exchanges: intransitive verbs are used in kinetic situations without dynamic exchange, and transitive verbs are used in kinetic scenes with dynamic exchanges. For example, the verbs *to take* or *to break. John takes the book.* Moreover, adding the verb *to touch* which is connected to contact, and in the same way, this sense of contact is referred to the verbs *to take* and *to break.*

However, *to take* and *to break* involve more than contact and give more information than the verb *to touch*. The verb *to touch* cannot give much detail relating to actions since the energy expenditure is minimal. The manipulation of *natural forces* of gravity or fluidity appears through containment, support and suspension. When an LM does not control the correspondent target, in French, the preposition *sur* is mentioned and not the preposition *contre*. In English, in contrast, both prepositions tend to be equivalent to the preposition *at* (Vandeloise, 2006).

For instance: *l'enfant jette des pierres sur le chat (the child throws stones at the cat). L'enfant jette des pierres contre le mur (the child throws stones at the wall).* In this context, *contre* can be understood to mean *against* (meaning the child throws stones against the wall).

Moreover, the French preposition *contre* and the English preposition *against* may be in symmetrical and asymmetrical static usage. For instance, *the pear is against the basket*. Here this sentence involves a symmetrical exchange of energy because there is an action and a reaction in the scene of the pear and the basket.

The following example involves asymmetrical static, dynamic relations because the wall overcomes the motion of the broom (the brush for sweeping): *the broom is against the wall*. Thus, only the LM, the wall, cannot support the target. The floor and the wall are necessary to maintain the broom in the same position. In fact, *in*, *on* and *against* appear in asymmetrical static, dynamic scenes that concern simply static forces. The preposition *against* may be used to illustrate kinetic dynamic situations and also static symmetrical or asymmetrical relations of energy.

Vandeloise (2006) also comments on some aspects of the spatial uses of prepositions. In fact, proceeding with the research of a spatial description, here the notions of *complex primitives*, *logical diachrony* and *impulsion* are described below. A spatial description is used by children learning their first language, although abstract uses and extensions of prepositions would not be learnt until the adult stage of their language development.

The notion of **complex primitive** is named *primitives* for dealing with pre-linguistic concepts, and for pertaining to a form from which a word is derived, and *complex* for having distinctions of *family resemblance features* (Vandeloise, 2006). For instance,

general orientation is a complex primitive for some uses of prepositions *in front of/in back of*. The apprehension of general orientation comes first, and afterwards, the knowledge of the prepositions *in front of/back of*. Most of these features of general orientation are, for example, the side of frontal orientation, a path of sight and directions of motion.

In addition, complex primitives may describe the scenes of relations between container and content (relation C/c) with a possible feature of *concavity*, and the scenes of relations bearer/burden (relation B/b) with a possible feature of *horizontal plane*. Some of the family resemblance features are *control in many directions* and *control from below in the vertical axis* in order to define complex primitives. In a language, it is necessary to adapt semantics and meanings for real situations. Some features of complex primitives are determined in these real situations of motion.

As for the second notion of logical diachrony (Vandeloise, 2006), speakers can acquire the knowledge of a language through connections with memory. The birth of each word has a connection of meaning and form that is named *impulsion*. At this point, spatial words would possibly not be understood in a similar manner by all the speakers in a community. Thus, *personal impulsion* refers to the initial contact of children with words, and after the initial contact, the evolution of these words and their learning provide usage events for *logical impulsion*.

Vandeloise (2006) defines the notion of *logical impulsion* in reference to the use of a word that derives from a system. The objectives of the extension of this system are to maintain true statements for several words, and at that point, this is named *systematic*. For instance, even though a bottle is turned upside down or inverted on some occasions, the word bottleneck means *le haut de la bouteille* in French. This is an extension referred to as the *principle of fixation* that is seen as the usual position of an object in space.

Therefore, the purpose of *logical diachrony* is to supply a series of *logical impulsions*. Logical diachrony interprets words by meanings from a network with the objective of explaining whereby and how words are structured in such a way. Similarly, the related term is named *radial categories*, which Lakoff (1987) describes for the preposition *over*. Hence, the study describes the essential principle needed to understand the extensions of the meanings of prepositions, including complex primitives, logical diachrony and logical impulsions.

However, all languages do not share all the meanings or uses of words from logical diachrony. The knowledge which children have does not include logical impulsions but pre-linguistic concepts at some levels of generalisation. In short, language reflection on the concept of space determines that it is not static topological or geometric visual models but dynamic visual models associated with the use of space learned from experience. Hence, symmetrical relations, asymmetrical relations, complex primitives, logical diachrony and logical impulsions are relevant notions to consider within the developed language.

In addition, Sowden & Blades (1996) analyse the learning process of the prepositions *next to* and *near to* comparing the answers of children and adults. Both of them seem to understand these prepositions in a similar way. Although there is not a concrete definition of these prepositions, the context is necessary for understanding their meaning. When a concrete definition does not appear for a given preposition, the learning process (Erreich & Valian, 1979) may occur in two ways.

The first way is to identify the common examples in which these are usually used. Here these examples would appear in a category with the best example, which is the most commonly used one within this category. This example is called the prototype of this category. When children acquire knowledge of locative notions, one prototype will be developed from experience. In this process of acquiring knowledge, the first steps may not happen in the same way for adults and children due to the lack of common experience, that is to say, that children's experience of learning this preposition is not usually the same as that of adults' experience.

The second way is to identify an imprecise notion which refers to a salient category. Then, a prototype will be developed in this category too. In that case, when children learn a salient example, a prototype may be identified in a similar way to adults at an early stage.

Thus, some studies from Erreich & Valian (1979) and other studies which describe the spatial relations of the prepositions *next to* and *beside* note that at an initial stage, the process of learning is acquired in a similar way in both children and adults.

2.9 The semantic structure of prepositions

In the last two decades with respect to Cognitive Linguistics, a theoretical framework has been constructed by those whose concern is to show the structure of spatial meanings. Thus, three types of models have been applied to analyse the polysemy of prepositions, such as named radial networks (Lakoff, 1987; Brugman, 1981), hierarchical network (Langacker, 1987) and multidimensional composition (Deane, 1993, 2005). Currently, Navarro i Ferrando (1998, 2000, 2002, 2006a, and 2011) has described the multidimensional radial network of spatial relations in a proposal that exhibits the influence of radial, hierarchical and also multidimensional networks.

Within the topic of prepositional networks (Sandra & Rice, 1995), a question may be asked as to how many distinctions need to be represented in such a network. There is no exact clarification of these aspects. In fact, there are as many types of network models as there are theoreticians to create them. For example, Brugman & Lakoff (1988) write the analysis of the verb *have* and in an earlier study of the preposition *over*, concerning what is involved in lexical networks. The sorts of properties considered are: related senses, the interrelated nodes in a network, the representation of different senses, and

the distance, the direction or the density of the links and these properties are examined in order to give an understanding of the inter-relatedness of these lexical networks.

Thus, the first definition entails the main sense of the word, and even though this is often the prototype, there are no particular constraints or limitations to order the related senses or subsenses (frequency, historical development or degree of generalisation). For example, Lakoff (1987) idealises a radial structure at the centre point with a prototype. The radial structure is a horizontal connection. However, in contrast, a hierarchical network points to a top-down or vertical connection between links. The radial structure and the hierarchical network (dictionary-type network) are specific about the centre and the top of the relational networks but are vague about the concepts on the periphery of these networks

Therefore, the context includes information for linguists, for example, a sentence (Sandra & Rice, 1995). However, a question focussing on the context here is how much information is given by the context, and in that case, how unspecific is the context in providing the meaning of a word. In a monosemy approach, the context is assumed to be a major function, and the meaning is abstract in extending the lexical information. The extra information of interpretation is deduced from context. In a polysemy approach, the context would have a distinct role since this context selects a fully developed meaning from a network. Briefly, the question at issue is whether the abundance of accepted types pertains to the area of lexical meaning or to the area of sentence meaning.

Sandra & Rice (1995) conclude that the problem is centred on the **level of granularity,** that is, the level of detail. However, it is uncertain whether the networks represent all the meanings related to a word itself or whether language users obtain the meaning of a preposition by a fractured process at the level of representation. Basically, this is the problem of deciding whether the distinctions are from a representation in the mind or an interaction of this representation in the mind with the contextual extension. Thus, prepositional networks propose distinctions with empirical data that come from the experience acquired. That empirical data is necessary to demonstrate that a representation of meaning is presented by a degree of granularity or level of detail.

The semantic structure of the prepositions *on*, *in* and *at* displays the three dimensions of perceptual space since all of them are relevant for a child in the first stages of linguistic development (Navarro i Ferrando, 2006a). Children are aware of the contact of objects, the topology that is intrinsic in a given situation. In addition, humans are aware of aspects of interaction and functions; these are likely to be used to identify and classify objects.

Considering the process of learning, perception, language acquisition and cognitive development occurring in the first stages, a perception event as a sensory experience, an action as a motor experience, and an interaction as a functional experience add to this conceptual improvement.

Correspondingly, a preposition denotes not only the location itself of a TR related to the LM, but rather a location (topological dimension), a concrete orientation for movement (dynamics dimension), and for some kind of goal (functional dimension).

The three perceptual dimensions of the prepositions *on, in* and *at* are illustrated below (Navarro i Ferrando, 2006a):

- **Topological** aspects of perception: *The point at the centre* (coincidence). *There is water on the wall* (contact). *The stone is in the box* (inclusion).

- **Dynamic** aspects of perception: *Rush at him!* (target). *Come on!* (sequence). *Hit him in the stomach* (penetration).

- **Functional** aspects of perception: *The parishioners are at church* (operation). *The soldier is on the machine-gun* (control, manage the machine-gun). *The prisoner is in handcuffs* (control).

Basically, both dynamic and functional relationships are as fundamental as topological ones in the process of acquiring spatial senses. These spatial words are practised in contexts where speakers hold an immediate bodily experience of these spatial senses. The relevance is oriented to the sensory-motor apparatus of a speaker (sensory and motor functions of an organism) and the functional experience itself. In short, perception, action and interaction are the three dimensions needed to supply the construal of a situation (Navarro i Ferrando, 2006a).

In addition, the notion of *proto-concept* refers to the central and main meaning from which other senses can be understood, speaking of topological, functional or dynamic configurations. For instance, in the *proto-concept* of encounter of *at*, the topological relationship tends to be contiguity in a relationship, though contact is not excluded in some situations. In the expression, *the point at the centre* (coincidence), the relationship cannot be expressed by one of proximity.

In the sentence *rush at him!* (target), the front of the TR is oriented towards the LM as a dynamic aspect, and the position is horizontal regarding the canonical position of the human who stands on the ground. In the sentence *the parishioners are at church* (operation), the functional interaction retains a face-to-face pattern, with an intention to use or manipulate the LM in a canonical way. This canonical way may be expressed by either physical, biological formation or cultural habits of the participants.

In addition, three imaginary procedures for meaning extension are proposed (Navarro i Ferrando, 2006a):

- *Shifts*: a slight change of *proto-concept* is suggested in the schema of rotation.

- *Partial sanction of proto-concept*: in a specialisation of meaning, a configuration is focused, and the others remain in the background of the conceptualisation.

- *Metaphorical mappings*: from the physical onto abstract domains, which are considered for figurative meaning.

The network is supposed to be an interpretative device of linguistic acceptability within the methodology of analysis with no reality itself. Nevertheless, the network makes accurate predictions on real language spoken by adults. A method for sense distinction is provided by multimodal family resemblance formations and image-schema alterations. In the network, the interlinking of senses shows a relational structure, that is, an interconnected network of senses which all relate to each other. Moreover, the distance between senses is noticed by the degree of the family resemblance and is also graphically assigned by the attribution of senses in the conceptual regions (Navarro i Ferrando, 2006a).

These conceptual regions are defined by experiential configurations, which are topological, dynamic and functional, and these join with each other, and a concrete use of a preposition may be relevant for two regions. Thus, family resemblance and multimodality configurations propose a method for relational structure, sense distinction, and conceptual distance. This semantic model may be applied to other prepositions, also considering all aspects of meaning, such as functional, metaphorical, referential or pragmatic.

2.9.1 Comprehension of prepositional semantics

In bilingual or monolingual dictionaries and materials for English foreign language, there are many definitions of prepositions, although some examples are misleading and inaccurate for learners of a new language (Brala, 2000). Indeed, an area that is considered to be the most difficult is the usage of prepositions as abstract concepts. Lindstromberg (2001) notes that at the upper level, fewer than 10% of students could comprehend and use prepositions properly. Spanish, as well as French students, were confused about these words, even though they were near-native learners.

Brala (2000) may want to ask a question: why is this so? Two of the reasons are: basically, the prepositional procedures can vary in different languages. Prepositional semantics from dictionaries do not have a clear explanation. In fact, prepositions can be revised so as to learn from two distinct aspects: the first one is the grammatical aspect, the dictionary aspect or usage, and the second one is the semantic field defining the broader meaning of prepositions.

From the grammatical aspect, there was not an interest in prepositional semantics for a long time (Brala, 2000). However, from the linguistic development aspect, the inclination towards prepositions has changed, particularly in recent times. From a syntactic viewpoint, prepositions are viewed now at the same level of equality in sentences as verbs, nouns or adjectives. From the semantic viewpoint, an increase in the number of researchers is noticed in the semantic field, although this increase in research

needs to have clearly defined academic parameters in order to yield accurate findings rather than that research that is currently proposed by intuition.

Moreover, a question may be asked: what relations are productive? In fact, looking at a few prepositions is not enough for clarifying definite and productive relations. For that reason, Brala (2000) has suggested complex primitives that could appear in other linguistic contexts and other languages in contrast to the focus on prepositional meanings, which was a feature of the ’80s and ’90s.

Thus, more scholars have been increasingly interested in this aspect of prepositional meanings, although, despite this interest, linguists do not agree on a unique explanation of their collective findings. In general, some linguists agree on the following points: prepositions are, to a certain extent, gestalt-kinetic in nature. Prepositions are enriched with geometrical and functional composition so as to make them adequately suitable for metaphorical extensions.

Interpreting categories of prepositions from a topological dimension, the gestalt-kinetic elements are hidden. In fact, this difficulty can be solved when prepositions are treated as *functional configurations* instead of topological configurations. Thus, from a functional perspective, the question is, in a scene or setting, which features does the ground establish for the position of the figure?

Briefly, Brala (2000) determines the prepositions *in* and *on* in terms of the following three points: dimensionality, orientation and attachment, respectively.

-*Dimensionality*: related to the number of axes of the ground (one dimension, two dimensions, circle, or three dimensions).

-*Orientation*: the contrast of a present orientation versus an absent orientation. In a present orientation of 90º or 180º angle characterised by gravity, or in an absent orientation when that orientation is to an irrelevant angle.

-*Attachment*: it refers to contact, human-made such as paste or screw, or also side bounded attachment.

In addition, definitions of the prepositions *in* and *on* have not been modified in certain dictionaries (Brala, 2000). The facts are that prepositions have been and are complicated for learners and that the representations of these two prepositions heretofore have been and are ambiguous or misleading. Hence, this lexical representation focused on *profitable relations* is a more accurate analysis of cognitive semantics than the existing one in that year. This one should need a concrete explanation of the gestalt-kinetic with the relational function, and this should also present a division of types or categories of usage with schematic elements and cross-linguistic coherence.

After the analysis of the prepositions *in* and *on,* Brala (2000) also tries to adapt the same proposal to the preposition *at.* For example, the proposal of the following four

subcategories of the preposition *at*, namely, *coincidence* or *zero-dimensionality* (Lindstromberg, 2010):

-A figure and a ground are seen as a point-like in a coincidence point;

-Directional coincidences in verbs look *at, work at,* or *throw at*;

-Functional coincidence of an activity such as *play, work* or *fight*;

-Temporal coincidence for time expressions or hours, basically.

This analysis should be applied in other languages in order to have the option of allowing the learner to guess the meaning of unfamiliar constructions.

2.9.2 Perceptual space and spatial space

According to Clark (1973), space and time are categorised into four sections, namely: 1) the properties of perceptual space (**P-space**). 2) Comparison of spatial space (**L-space**) with English spatial expressions. 3) Explanation of time expressions and spatial expressions. 4) Presentation of the correlation of semantic meanings.

For Clark (1973), in a gravitational world, the child's perceptual abilities, hearing, seeing, biological makeup facilitate his ability to develop his sense of perceptual space, a P-space which determines the speed at which he learns and the content. The child's acquisition of the English terminology of space and time, his L-space, reflect his cognitive development and follows an already acquired conception of the meanings of these semantic terms.

The world consists of objects, people, space and time and is perceived uniquely by each individual. Space and time expressions are, therefore, used according to the individuality of the English-speaking person to describe what they perceive.

Reference points, lines, planes and directions are considered as basic notions of man's P-space and are used as such by physicists. In P-space, objects are situated with respect to other objects, and these other objects function as a reference of one dimension. The reference lines can be in two dimensions, and reference planes can be in three dimensions. Therefore, in geometry, these reference points, lines and planes describe directions. The distance could be positive from the reference point on one side to a distance away from this point or negative on the contrary side.

What are the characteristics of interaction between people? A man has a symmetrical and perceptual body (Clark, 1973). In particular, ears for hearing, eyes for seeing, mouth for tasting, nose for smelling and lips, fingers, hands, or face for sensitive touching. The man's P-space presents one natural plane of symmetry, the vertical plane separating the right and left. The perceptual apparatus contains an asymmetrical plane, the vertical plane separating the front of the body from the back and beneath the feet

some objects at ground level. Consequently, from this observation, objects move in and out of the field of vision, and they enter the field towards and leave it from a direction.

In particular, there are three reference planes, one of perceptual symmetry (the vertical plane separating the right and left) and two planes at the right angle to this plane which is asymmetrical to the plane (separating the front from back in the vertical plane and at ground level the horizontal plane). The forward direction can be regarded as the positive direction of perception, and the backward direction is the negative one.

What are the main characteristics of man's P-space? P-space consists of three associated directions and three reference planes (Clark, 1973: 48): 1) A reference plane is ground level, and upward is positive. 2) The vertical plane (left to right) through the body is another reference plane, and forward is positive. 3) The vertical plane (front to back) is the third reference plane, and leftward and rightward are both positive directions.

The notion of point of reference is required for English adjectives and prepositions. For instance, *John is above Mary* (Clark, 1973: 36). In this sentence, her location is the point of reference, and it is a statement that allows her location to be known with respect to the other person. Usually, the object of the preposition is a reference point (a point, plane or line) for locating some objects. The same situation holds for the other prepositions in English.

In fact, each adjective has two points of reference. For instance, *the balloon is high or low* (Clark, 1973: 36). It means that this balloon is high or low off the ground. Unless another point of reference is explicit, *high* and *low*, have a common reference plane, ground level. This origin or zero point could be called the principal point of reference. Certain adjectives and prepositions indicate a unique direction, such as in the case of *high* and *low*, where they apply to a reference of verticality.

There are a few basic spatial adjectives (see table 9). For instance, *long, short, far, near, tall, short, high, low, deep, shallow, wide, narrow, broad, narrow or thick, thin*. These adjectives define the dimensions of distance, length, tallness, width, breadth, height, depth or thickness.

Adjective-pair	**Extent or position**	**Number of dimensions**	**Unmarked point of reference**	**Dimension**
Long-short	Extent	1	Ego	Length
Far-near	Position	1	Ego	Distance
Tall-short	Extent	3	Ground level	Tallness
High-low	Position	3	Ground level	Height
Deep-shallow	Extent	3	Any surface	Depth
Deep	Position	3	Any surface	Depth
Wide-narrow	Extent	2	A secondary edge	Width
Wide	Position	2	A secondary edge	Width
Broad-narrow	Extent	2	A secondary edge	Breadth
Thick-thin	Extent	3	A tertiary edge	Thickness

Table 9. Summary of Some Properties of English Spatial Adjectives (source: Clark 1973: 40)

Some examples of prepositions are: *far-near* and *long-short* are described at least in one dimension. In this case, a line in geometry is called *length,* and when it refers to the position of one point with respect to the other is called *distance.*

Many prepositions in English share the same properties with adjectives. For example, there are one-, two- or three-dimensional applications of points of reference. Some of the pairs of prepositions are *ahead-behind, in front-in back, under-over, below-above, on top of-underneath, up-down* and so on. In English, the most neutral prepositions are *in, at* and *on*. For example, *John is on the grass* presents the grass as a two-dimensional surface, whereas *John is in the grass* presents the grass as a three-dimensional space, where the subject John is inside the grass and the space around him.

These three prepositions (*in, on, at*) and positional terms are related to these three positive directions *into, to* and *onto*, and negative directions *from, out of* and *of,* and the pathway terms are *via, across* and *through*. In short, the main point of using these prepositions is in relation to the direction, the position of something as a point, and the precise location.

Thus, the reference point is simple in a one-dimensional application, whereas in more than one dimension, it is more complex (see table 10 below). The reference point coincides with this one-dimensional application of *length* and *distance* and is more than a one-dimensional application of *tallness, height* and *depth*. In addition, the *from*-phrase indicates the beginning of the movement, and the *to*-phrase indicates the end of the movement, and these phrases indicate a positive direction.

Number of dimensions	**Location**	**Positive direction**	**Negative direction**	**Path**
1	At	To	From	Via
2	On	Onto	Off	Across
3	In	Into	Out of	Through

Table 10. Prepositions of Location and Location + Direction (source: Clark 1973: 41)

These prepositions (*above-below, ahead-behind, over-under*) indicate the location and specify a direction from the point of reference where the object is located. They are presented in a vertical direction by direct reference to downward pulling and by reference to the top and bottom sides of the object. These are certain relational prepositions such as *front* and *back*, and the definitions of *in front of-in back of, ahead-behind, before-after*.

For example, *John is ahead of Pete in height*, which means John is taller than Pete. With regard to metaphor, *ahead of* means positive direction. In general, *front* and all the other prepositional similarities or offspring are positive, and *back* and its offspring are negative. The front-back dimension of L-space coincides with the properties of P-space.

As a summary of these properties of L-spaces (Clark, 1973: 34, 39):

- L-space shows the principle use of points, lines, and planes of reference in relation to prepositions where there are one or two, and in adjectives, there are two.
- Mainly, there are three specific planes of reference:
  1) Ground level: upward is positive, and downward is negative.
  2) The vertical plane of right-left with forward positive and backward negative.
  3) The vertical plane of front-back through the body, with right and left both positive.

Therefore, there are the same properties in P-space and L-space. Both of them require points, lines and planes of reference, the same three specific planes with the same positive and negative directions, and both use the notions of the canonical position and canonical encounter. This is strong evidence for supporting the correlation hypothesis; specifically, there should be a correlation between P-space and L-space.

Chapter 3: The semantics of prepositions *at, beside, by, near* and *next to*: State of the art

In this chapter, the semantics of prepositions *at, beside, by, near* and *next to* is reviewed so that the semantic categories and spatial senses of these prepositions are described in reference to the consulted literature. In my view, these subsections present current knowledge of these five prepositions.

In the state-of-the-art on spatial semantics, some questions are bound to arise: why has spatial semantics received such attention in Cognitive Linguistics? What have linguists and researchers revealed about the polysemy of prepositions? What have they not done yet? What have they not solved in a satisfactory way?

Spatial semantics has received much attention from the 1980s to now. One of the reasons is that spatial semantics studies the principal aspect of human perception and experience. The second reason is that there are strong resemblances between space orientation and other expressions of spatial domains such as temporal or abstract meanings.

Concerning the usage of prepositions, there is still not an exact procedure or theory to decide which preposition may be appropriate to use in non-collocation contexts. In dictionaries, however, there are short definitions and some examples of sentences, but not an interpretation of these sentences in context. Some linguists and researchers have written about the polysemy of prepositions and distinct senses and meanings of spatial orientation in monographs such as Brugman (1981), Lakoff (1987), Vandeloise (1991), Navarro i Ferrando (1998), Lindstromberg (2010), Feist (2000), Levinson (2004), Langacker (2008), Talmy (2000) and Tyler & Evans (2003). In addition, spatial semantics is described in numerous articles such as Deane (1993, 2005), Lindstromberg (1996), Coventry (1998), Coventry & Garrod (2004), Zlatev (2007), Langacker (2010), Robinette et al., (2010), Navarro i Ferrando (1999, 2000, 2002, 2006a, 2006b, 2011), Sandra & Rice (1995), among others.

There are several studies about the prepositions *in, on* (Feist, 2000; Lindstromberg, 2010; Navarro i Ferrando, 1998, 1999, 2000, 2001, 2006a; Silvestre-López, 2009; Johansson Falck, 2015, 2018) and *at* (Deane, 1993; Navarro i Ferrando, 1998, 2002, 2006b; Knaś, 2006, 2007; Kokorniak, 2007; Brenda, 2016) within the framework of Cognitive Linguistics. I have found some information about the prepositions *near* (Brenda, 2017), *by* (Deane, 1993), and only very little information about the prepositions *next to* (Sowden & Blades, 1996; Brenda, 2019) and *beside* (Rissanen, 2004; Zwarts & Gärdenfors, 2016). On some occasions, the information about *next to* and *beside* that I found is not related to the polysemy of prepositions and the senses of prepositions, but to a comparison of two languages (cross-linguistics), teaching a second language or how children and adults understand prepositions.

From the theoretical background of Cognitive Linguistics, the following authors have analysed these parameters that I use for my research:

- Several authors have proposed the three perceptual dimensions: topology (Deane, 2005; Navarro i Ferrando, 1998), dynamics (Talmy, 1983, 2000) and function (Vandeloise, 1991).
- The relevance of the three perceptual dimensions (topology, dynamics and function) has been proposed by Navarro i Ferrando (1998, 2006a) and Silvestre-López (2009).
- The three frames of reference (intrinsic, relative and absolute) are presented by Levinson (2004) and Robinette et al. (2010).
- The principles of construal, the vantage point, the perspective and the temporal dimensions are defined by Langacker (1991, 2008).
- Image schemas in language structure are described by Johnson (1987, 1989), Lakoff (1987), Cienki (1997), Peña (2000), Santibáñez (2002) and Oakley (2007).
- The scale of animacy with the prepositions *in* and *on* is clarified by Feist (2000) and the contrast between English and Spanish by Olloqui-Redondo, Tenbrink & Foltz (2019).
- Reciprocal orientation, asymmetry and the predominant entity are detailed by Talmy (2000).
- Functional relations, spatial prepositions and the specification of lexical units are explained by Coventry (1998), Coventry & Garrod (2004) and Vandeliose (1991, 1994, 2006).

In addition, some related studies have criticised the polysemy of prepositions and have questioned the primary importance of space and the representation of polysemy networks (Sandra & Rice, 1995; Tyler & Evans, 2003; Zlatev, 2007; Van der Gucht, Willems & De Cuypere, 2007; Kokorniak, 2007).

For example, Sandra & Rice (1995: 125) focus on the critique for representing incompletely defined network analyses. The issue is whether the determination of distinctions is a mental representation as expected by prepositional networks or is an interaction of a monosemous representation (one meaning) with the addition of contextual understanding. It is open to debate as to how the networks with a prototype and with metaphorical senses provide a division of the spatial uses. These tasks hint that spatial and non-spatial senses obtain more related meanings than homonymous units (unrelated meanings). In the basic lexical tasks, the senses, for example, of *in*, *on* and *at*, may impede the identification of temporal senses and a division of temporal senses and spatial senses of prepositions due to the difficulty of distinguishing which category of sense is being identified. Finally, future proposals may be argued in line with recent conclusions that seem to present decisive or conclusive results, although the resulting distinctions are not coincident in some aspects.

Van der Gucht et al. (2007: 740) note that prepositions may be understood to have different senses as prepositional meanings. Prepositions have meanings in a parallel way to verbs, nouns, adjectives or adverbs. These linguistic items manifest diverse semantic values. For example, the preposition *over*, a unique word, does not have the

same meaning as when used in a different lexicogrammatical context, as adverb, prefix or suffix. These textual constructions are grammatical combinations of *over* with other words. As far as compiling a list of senses is concerned (Lakoff, 1987; Johnson, 1987; Tyler & Evans, 2003; Van der Gucht et al., 2007), the derivation of *over* is from experience and bodily interactions, each of which is not a linguistic criterion or principle.

Tyler & Evans (2003) have commented that from the senses of *over,* the primary sense of a preposition is understood in a context. However, Van der Gucht et al. (2007: 740-741) have suggested the contrary to this point, and their analysis is also open to discussion. In an accurate way, prepositional meaning is not seen in relation to lexical meaning but to instrumental meaning. An instrumental meaning is a relational meaning with a function, as is the meaning of *over* in combination with other words. The meaning of a context should not be read into the meaning of a preposition. The meaning of *over* indicates a function in relation to the meaning of a noun and a verb.

Lakoff's valuable analysis of *over,* which was inspired by Brugman (1981), has influenced other linguists such as Deane (1993, 2005), Vandeloise (1991), Tyler & Evans (2003) and Zlatev (2007). Some studies have modified Lakoff's theory and viewpoints, and the analysis of *over* is compared to its equivalent in other languages. However, Lakoff (1987) does not propose a criterion to clearly recognise simple uses and distinct senses (Van der Gucht et al., 2007). Instead, he proposes some links to demonstrate distinct senses and the polysemy of prepositions. Tyler & Evans (2003: 37), in opposition to Lakoff's analysis, suggest that not only is it too detailed, but also of questionable polysemy. A suggestion is to diminish the number of polysemy senses and to clarify the distinction between interpretations of context (context-dependent uses) and distinct senses. Thus, there is a balance depicted between the two edges concerning the superficial description (not being a profound description) and the specificity level or profound level (being the fact of an exceeding description).

Kokorniak (2007: 38-41) has also commented on the distinction of geometrical dimensions in reference to prepositional meanings. For example, regarding the preposition *at,* dimensions of the LM are not usually significant due to the coincidence of a TR and an LM in a reference point. However, these dimensions should not be overvalued or neglected either. For instance, Lakoff (1987) has identified senses in a context-dependent and dimensional way such as extended LM, non-extended LM, contact or non-contact.

Nevertheless, some authors agree that Lakoff overuses the number of senses by specifications and dimensions (Vandeloise, 1993; Tyler & Evans, 2003). Sandra & Rice (1995) argue that there are linguists interested in interpreting semantic networks, which may be done by taking many different approaches to distinction, in view of the lack of parameters or boundaries by which to establish interpretations. Tyler & Evans (2003) have proposed clarification in opposition to the distinctions of dimensionality in the LM. Considering that metric and dimensional features should be together, the metric

features do not often conform to having distinctions in space relation. Clark (1973: 40) has indicated that geometrical dimensions of an LM (point, surface and volume) are one important criterion that may distinguish senses in prepositions such as *in, on* and *at.* Navarro i Ferrando (1998: 173) has proposed that the three perceptual dimensions of topology, dynamics and function are also important in order to distinguish the different meanings of prepositions.

After an interconnection of some studies, in my view, some arguments should build up to show that these problems are not yet solved, and some intriguing and unanswered questions may still arise at this point. In this field, some points are still troublesome, and there are some gaps that may be identified in the theoretical background and in other studies, such as the dimensional parameters, the agreement for a distinction of senses, the relevance of a context, and the number of senses (prototype and related senses). Some attempts have been made in previous accounts of prepositions, but these only display certain aspects of them lacking enough integrity and detail. Further research needs to be carried out into the motivation behind the use of concrete meanings and abstract meanings (see section 7).

In my opinion, I agree with the grammar aspect pointed out by Van der Gucht et al. (2007) that prepositions have meanings and functions that are relational meanings with other words such as nouns or verbs. Reading the grammatical combination of words, however, some distinct senses may be distinguished by a preposition. A unique preposition does mean position, direction or movement. Nevertheless, I do not agree with those authors who assert that the meanings of prepositions should not be taken from a linguistic context. As laid out by Tyler & Evans (2003), I also consider the same point that the context provides distinct meanings which can be linked to prepositions. The context may reveal meanings of specificity, function, or scope in a scene.

In terms of the distinction of senses, I agree with Tyler & Evans (2003) that a network analysis should be clear and with a reduction in the enumeration of senses. A division is clear given an example of the related primary sense and distinct senses. I also agree with Navarro i Ferrando (1998) and Kokorniak (2007) that the distinctions of perceptual dimensions (topology, dynamics and function) are relevant for the representation of prepositions and the interpretation of these meanings. Numerous studies propose network analysis of distinct senses so that a clear presentation of these distinctions, in my view, should be considered in relation to the function, including bodily interaction and experience.

My study has been influenced by the work of other linguists who explain the meaning and the polysemy of prepositions. However, they do not focus their attention on the same subject matter. Each of them focuses on one particular aspect, such as the definitions of concepts, different prepositions from the ones I tackle, or they only delve into one parameter instead of various parameters, as I do in my study.

The previous studies are in line: Geeraerts (2010) proposes how meaning is grouped; Lakoff (1987) and Brugman (1981) indicate a prototype with a radial network with

senses; Langacker (1987, 1991) mentions the cognitive basis of grammar, the notions of TR and LM and a hierarchical network; Deane (1993, 2005) proposes a multidimensional composition; Navarro i Ferrando (1998, 2000, 2002, 2006a, and 2011) illustrates the multidimensional radial network together with the effects of radial and hierarchical networks; Vandeloise (1991) details the relative function in English and French prepositions; Talmy (1983, 2000) accounts for dynamics, reciprocal orientation and asymmetry; Levinson (2004) describes the frames of reference (intrinsic, relative and absolute); Feist (2000) clarifies the scale of animacy between participants; Johnson (1987, 1989) and Lakoff (1987) explain the role of image schemas in conceptual meaning.

Thus, it seems that these authors do not explain the semantic parameters following a simultaneous and constructive procedure. However, I have done so. I concentrate on five prepositions so that for each preposition, I add the predominant value of the semantic dimension (topology, dynamics or function), the intentionality (mutual/no mutual attention between a TR and an LM), the frame of reference, the relative position (asymmetry/symmetry), the animacy of a TR and an LM, the relative size (TR<LM, TR>LM, TR=LM) and the image schema.

3.1 The preposition *At*

According to the Cambridge dictionary, the English Oxford dictionary and the Merriam Webster dictionary, the first three definitions of *at* are the following:

Cambridge dictionary:
***Place**: used to show an exact position or particular place (we'll meet you at the entrance).*
***Time**: used to show an exact or a particular time (there's a meeting at 2.30 this afternoon).*
***Direction**: in the direction of (she smiled at me).*

English Oxford dictionary:
*1. Expressing **location** or arrival in a particular place or position (they live at Conway House).*
*2. Expressing the **time** when an event takes place (the children go to bed at nine o'clock).*
*3. Denoting a particular **point or level** on a scale (prices start at £18,500).*

Merriam Webster dictionary:
*1. Used as a function word to indicate **presence or occurrence** in, on, or near (staying at a hotel, at a party).*

*2. Used as a function word to indicate **the goal** of an indicated or implied action or motion (aim at the target, creditors are at him again).*
*3. Used as a function word to indicate that with which one is **occupied or employed** (at work, at the controls, good at chess).*

Navarro i Ferrando (2002) explains that the clue to understanding the meaning of *at* is not determined by the configuration of the LM itself. Then, the main aspects to keep in mind for the purpose of expressing spatial relationships are (Navarro i Ferrando, 2002): the geometry of the TR, an orientation or path, a place, a point of view and a perspective, the scope, the frame of reference, and also the force-dynamics patterns of interaction through the participants.

On the subject of space, the concepts of space and the perception of space are also related. These aspects are expressed by words, and these words are connected with perceptual dimensions. The use of a preposition presents a particular structure of a spatial relationship between the position of two entities (a TR and an LM). This view involves the construction of a conceptual schema of a preposition, which relates to the use of perceptual features and thus, the core of a polysemy network is described.

This network connects the sense of a linguistic unit with its peripheral senses. This conceptual schema of prepositions includes a TR and an LM, which refers to the subject and the complement of the construction *N + V + Prep + N*, or the head and the complement of the construction *N + Prep + N*.

Thus, various relational aspects co-occur in the scope of a conceptual schema. In concrete terms, these aspects are the dimensions of topology, function and force-dynamics. These dimensions also describe the meaning of the preposition *at*. A radial category is formed by various senses of *at*, with the conceptual schema in the centre.

This radial category does not only demonstrate the diverse senses of a polysemous morpheme but also which of them is viewed to be the central one and which ones are viewed as being on the peripheral one (Sandra & Rice, 1995). In addition, and most importantly, it demonstrates which senses are connected to each other, e.g., the distance between senses as well as the mapping of expansion.

Furthermore, a conceptual schema does not always correspond with the prototype of the category. In categories, prototypical members are assigned by *cue validity* and by many variations through the prototypes of other categories.

The particular significance is attached to topological, functional, and force-dynamic aspects and their organisation in conceptual regions. These conceptual regions are not separate but become combined. Thus, in one region, senses may be far from or close to other senses depending on their situation and their measure of space in relation to each other.

The notion that the meaning of *at* stands for a concept located at a point is popular in the semantic description for this preposition. Herskovits (1986) suggests prototypical meanings, for example, a permanent notion linked with a preposition, the acceptance of which may depart from pragmatic understanding or linguistic practice. She provides an identification of types classified from tradition, which are called *sense shifts*.

Therefore, for this author, prototypical meanings focus on geometric relations that use some geometric figures; some examples are lines, points, surfaces or volumes connected with objects. These meanings are models pertaining to a unit, which remain in people's thoughts and inspire them to figure out new ways of using them. The meaning accepted for *at* is a physical *position* as in a spatial sense.

Gärdenfors (2015: 28-30) claims that using geometric notions of *domain* or *convexity* is essential to describe the distinctions between prepositions. Most prepositions are classified into *locative* (where something/someone is: sets of points) and *directional* (where something/someone is going: sets of paths). Locative and directional prepositions are represented by convex (curved) spheres in a domain that may be a spatial domain or a force domain. For example, the expressions *sitting at a desk* or *washing at a sink* refer to a *goal domain* which signifies an intention of being at a place (Herskovits, 1986).

Additionally, a structure with *at* identifies two points in a distinct description. They cross each other in space, the first point being projected onto an object and the second point onto an immobile location. According to Herskovits (1986), this situation involves an object or a happening *on*, *in* or *near* another object which establishes the boundaries of a location. Probable locations include words such as *place*, *location, or spot*. Some examples refer to the geometrical points and geographical locations (Herskovits, 1986: 128):

- *The book is at the place where you left it*
- *Paul is at Yosemite*
- *There are lounging chairs at the beach*
- *There is a Christmas party at the office*

When two prepositions are interchangeable in the same context, the choice of one over the other focuses on the geometric features: *at* applies to a point, *on* to a surface of support, and *in* to a container or volume. At that point, the question proceeds to why a speaker selects one geometric feature instead of another on each occasion.

The representation of a schema for a prepositional concept is structured by our bodily/ physical experience and our perceptions of space, as well as the interaction and linguistic contributions. However, children do not have considerable experience of locations in space as adults may have. When the notion of a *point* is understood as a place or object whose prolonged part and internal organisation are given little or no attention by theorists, this notion of *point* should be excluded from semantic representation and graphic images depicting the meaning of *at*.

Indeed, although people may overlook certain aspects of objects or areas for linguistic intentions, places or objects are not visualised as points, e.g., as having no expansion and no internal grouping.

A vision of an LM as a point and a TR as a line in space results from metonymic thought. The metonymy highlights a geometrical schema of a circumstance by removing other features, which gives a clue for interpreting the meaning connoted by a preposition (Talmy, 1983).

At the final level in the procedure for creating a representation, the following spatial and physical dimensions determine the schema of the preposition *at* (Navarro i Ferrando, 2002: 7-8):

1. Functional front of TR: the TR of *at* is an entity or a human being that can be visualised as having a functional front. Some non-human entities are considered as having a front by which they interact with the LM. For instance, by analogy with the human model, a chair has a front by which it *interacts* with a table. Thus, the phrase *the chair at the table* is adequate. The reason is that a chair may be situated with one of its lateral parts oriented towards the table and in such a way that it comes to associate with the table.

2. Function of LM: the LM is seen as an artefact (a handmade object) that offers the TR an available side for interaction. Here, the notion of an artefact is perceived in the sense of any object or human being which can act with other entities having a functional front, either in some natural or cultural way of learned behaviour or by taking up a position. Hence, *the man at the tree* can be determined as a man picking fruit or a man taking care of the tree, as long as the parts of the tree are convenient for use or manipulation.

3. Contiguity of TR and LM: TR and LM are presented in a relation of contiguity by means of their topological features. The contiguity described by *at* does not connote or keep out contact. Though direct contact, as is specified by *on*, entails contiguity. On the contrary, proximity indicates lack of contact, as specified by the preposition *by*.

4. Interaction between TR and LM: considering their functional configuration, TR and LM are supposed to interact with each other in a face-to-face model. Hence, a chair situated with its back towards a table is not *at* the table. In this case, the chair's positional significance is signified by using the preposition *by* the table since *by* does not demand the functional front of the TR to focus towards the LM. A certain act of intending is viewed on the part of the TR in using or manipulating the LM itself. Thus, *A at B* signifies that *A* uses or operates *B* in a specific standard way.

5. Directionality: considering the force-dynamic configuration, the positions of TR and LM pertinent to each other establish a general axis, along which their connection creates a certain direction in space. This axis is set by the functional front of the TR and its position towards the LM. Prototypically, this is the horizontal axis which is found in the canonical position of the human on the ground. For instance, a chair that is lying on the

floor could not be viewed as *at* a table, nor can a chair be *at* a table, since it does not propose its reachable side for an interaction. Thus, the directionality of approximate positions or the axis of motion is assigned by a line, which is at right angles to the axis of the TR, and that remains its standing location.

6. Active zones: TR and LM offer *active zones* which are identified with the sides which interact with each other. Then, in a formed image where a man is picking fruit *at* a tree, the man's active zones are clearly his face and the palms of his hands, while the active zone of the tree is the accessible branch where the fruit hangs. In brief, the TR's active zone is seen by its functional front, and the LM's active zone is seen by any of its usable areas and which are easy to approach by the TR.

7. Scale: TR and LM are provided by being oriented on the same scope. Hence, in usual situations, a chair is not perceived as being *at* a galaxy. The conceptual schema specified by these spatial and physical dimensions is related to an *encounter schema*. This *encounter schema* occurs in some examples: *at the table, at anchor, at a keyboard, at the mirror, at the altar, at the wheel, at the window, at the bar, at the helm, at the well*, among others. Here in all these scenes, people use tools, instruments, or other types of objects.

Regarding the senses of topology, force-dynamics and functionality, the following information is summarised (Navarro i Ferrando, 2002: 7-8):

In **topological senses**, contiguity is more commonly focused on than force-dynamics and functional dimensions, which remain in the background. The sub-sense of *coincidence* is distinguished in this sense of topology. Although contact is not indicated, the possibility of interaction appears. This sub-sense, called coincidence, usually employs words like *place, location* or *point.*

In this sense, at is added with lexical words that involve events or periods (at birth, at maturity, or at infancy). In addition, this sense creates several phrases designating periods of time such as the parts of the day (at noon, at midnight, at day time, at night, at dawn, at dusk, or other phrases of time at present, at time. This sense also occurs with less idiomatic terms of time such as interval, moment, turn, period, or date. The relationship of the TR with the period of time is one of minor coincidence but is opposed to on, which connotes duration and a successive view of time, or in, which connotes insertion in the period.

For the acceptance of the *degree on the scale* of *at*, some collocations may be understood that present a certain amount such as *at least, at most, at large* and their varied forms *at the least,* or *at the very least*. Some other idiomatic formulations clarify a level or degree on a scale *at best* and *at worst*. The accordance with temporal estimations is formulated by idioms like *at first, at last, at the very first*, or *at long last.*

In functional senses, the relation of interaction is emphasised. The subsense of *operation* is regarded here. The canonical interaction is perceived as use or

manipulation to influence the LM. Even though the topological and force-dynamic dimensions stay in the background, there is a coincidence point. The TR's intention and orientation establish a boundary and an axis of movement towards the LM.

At comes into view in this sense in scenes where people act, by means of their function, and canonically related to a precise place which is planned for that concrete purpose or function.

Some examples of functional senses using the preposition *at* are:

Performance activities: people who work as actors, dancers, or play in orchestras, in places destined for that purpose (in theatres, auditoriums, halls, opera houses, or sections of them, such as the screen, the arena, or the stage). Moreover, their actions and bearing and the events these actions create are included in plays, concerts, performances, films or representations.

Educational activities: people who work as teachers, professors, researchers, and other kinds of personnel, such as students as well as their manners, or tasks, and the events these lead to, in connection to the places where they are supposed to happen such as schools, universities, research institutes, or college of music, also sections of the insides of classrooms, or laboratories. The relationship between people and these manners or tasks in places mentioned is the action of activity, that is, the functional sense.

In force-dynamics senses, the focus is on the interplay between TR and LM and the TR's orientation. The topological relation of contiguity and the functional position stay in the background. Then, *at* is appropriate with other linguistic units that connote motion along the length of an axis or an inclination to achieve a goal, even though the moment of the union with the other entity is certainly not seen as a contact. The TR's course of motion is defined by its functional front as well as by the LM's accessible active zone.

The subsense of *search for contiguity* is distinguished here. The setting for this sense of *at* demands verbs denoting the notion of *directing at something* such as *beat, charge, come, dab, direct, dive, fire, flail, fly, go, jump, lash, lunge, make or run.*

Another sub-sense is *off contiguity.* This sense of the preposition *at* also outlines a direction that indicates the location in an LM. So, the relation of contiguity is a sub-sense that may be indicated. Some phrases such as *at a gesture, at a remark, at an order, at a suggestion* are found in this sub-sense of *off contiguity*. Here the TR is an entity whose response is imagined by the contiguity relationship with the LM itself.

Another sub-sense is *achieved contiguity*. The sequences indicate both motion and achieved contiguity, focusing on the end of the pathway. Trajectors are frontally positioned to manifest a precise directionality and asymmetry in the interrelation. In this case, simultaneity is also highlighted by the ending path. This sense of *at* can be estimated in the context of some verbs (*arrive, come, place, put, set*).

According to these three dimensions *at* indicates (Navarro i Ferrando, 2002: 7-10):

1. A topological pattern of coincidence.

2. A functional pattern of usage or manipulation of the LM by the TR (on purpose).

3. A force-dynamic pattern that pursues a horizontal axis established by the frontal position of the TR.

4. A relationship between two participants on the same level whose active zones are the functional front (TR) and an accessible side for an application (LM).

In *Functional Contrasts in Spatial Meaning* (Navarro i Ferrando, 2006b), the context is essential to decide the predominant dimension of a preposition in each case. One preposition may underline a topological dimension or dynamic dimension, while in contrast, another different preposition may underline a functional dimension in an identical context. Two prepositions may also underline different functional dimensions such as operation or intention in a scene whereby the topological relations are identical. The functional dimension of operation and intention is proposed, for example, in the preposition *at*. The TR operates in concordance with the LM in an encounter situation. For instance, *John Kay is a professor at the London Business School's Centre of Business Strategy*. Here, the LM is conveyed to be a building with the TR carrying out the action of teaching in the interior of this school being the LM.

The functional mode of the scene is what determines the choice of preposition. In spatial meaning, the context does not often provide sufficient semantic meaning for interpreting the construal. The function of the TR or the functional experience may determine the semantic device for finding this meaning. In any case, the topological relation often accepts two prepositions in a construal representation, and this structure does not have the information to decide on one preposition or another. Thus, the interpretations convey semantic motivation to select a particular preposition over another.

Knaś (2007) offers an account of different senses of the preposition *at*. According to this author, there is a lack of agreement about the number of senses of the preposition *at*. The only point in common among linguists is that each preposition is presented in a network of connected prepositional senses, and some members are prototypical, whereas others are peripheral. These categories from the network may differ within unclearly defined boundaries. Depending on individual judgment, this membership may change in the number of senses. In any case, all these uses of a form do not appear in distinct senses.

The preposition *in* is seen in three- or two-dimensional LMs, and *on* is seen with two- or one-dimensional LMs, establishing contiguity and support. *By* is seen with two or one-dimensional LMs, *at* is seen with one dimension for a point of reference (internal or external), and two- and three-dimensional LMs. Thus, the dimensions highlight the contrast between the various uses of these prepositions.

In terms of the distinct senses of *at* (Knaś, 2007), the primary sense of the preposition *at* is seen as a point of reference (1. *he is at the farm*). A distinct sense is a new spatial relation or meaning that cannot be imagined from the context. For example, 2. *he is at school.* Here, the LM, the school, adds a reason why a TR is at a specific place. It is an internal location with a particular function. In examples 1 and 2, the TR is oriented in the interior of the LM named as *internal proximity*. For example, *Mark is sitting at the computer*. Here, the TR is outside the LM and in front of the computer, named the region when he is using this computer. This relation is named *external proximity*.

For example, *they met at the corner of West Street and Park Street.* The location of the TR is external. The smaller the LM, the more accurate the TR's position converts. Another sense is the part-whole relation. For example, *soon, we were at the edge of the woods.* Here, the front-back or top-bottom is often determined. The LM is extensive and not precise as a part-whole relation to the TR.

Moreover, the concept of scale is the last distinct sense mentioned in this paper by Knaś (2007). For example, *there are fewer fish at 2.000 metres below sea level. At a distance it is difficult to make out the detail on the building*. Here the TR is situated in a specific or estimated distance measurement, and the LM is a point on this scale of the metric system.

The dynamic sense of *at* is also seen through movement in the direction of the LM, which is in opposition to the static sense. Sometimes, this movement does not point out how to enter the final goal. For example, the tall man aims a dart at the bull's eye. Here, the TR enters the LM after a movement in the directional of *at*. The author accepts the commentary of Langacker (1987) that a movement and a variation of position are likely in the construction of atemporal relations, meaning not limitations of time corresponding to prepositions.

In short, Knaś (2007) comments on the primary sense of *at*, as a TR plus the point of reference in two types of proximity:

1. Indicated for the more general spatial relations of prepositions with an internal or external orientation in proximity and, 2. In static schemas. Conjointly, other senses are mentioned, such as a **part-whole relation** when a TR is in an extended area, **the scale** when a TR is in a specific state of being visible from a distance, and **the dynamic** sense in movements headings or directions towards the LM in a scene.

Evans (2010) examines the lexical concept of *at* encoded by states and involves the parameter of practical association regarding the state senses. This author explains that the spatial uses of *at* refer to the most general phrase of localisation in space, presenting a relation between a TR and a point of reference that is proximal or adjacent. The aim is to establish the comprehension of these lexical concepts (with the analysis of the theory of *lexical concepts and cognitive models*).

Evans (2010) determines three different lexical concepts of *at* related to states:

- A state of existence (*at ease*): this state supports an entity and its state of existence.

- A state of mutual relations (*at war*): this state involves two entities in mutual relations.

-A state of external circumstances (*at risk of*): this state pertains to external circumstances and an association of mutual relations.

Moving to topological prepositions, Kelleher, Sloan & Mac Namee (2009) present an article about the semantics of English topological prepositions, and the preposition *at* is included, among others. The term topological relation means the type of relation used in geographical features (*inclusion, touching*) and is different from a topological preposition.

Kelleher et al. (2009) comment that topological relations were classified between 2D and 3D maps, interpreting these topological prepositions *at*, *on* and *in*. In two experiments, an image is shown with two objects to describe the position between two objects changed (*disjointed, on boundary, overlap, containment, within*). Thus, the findings generated descriptions of natural language using these prepositions in spatial configurations as a starting point.

In her paper *The semantics of at*, Brenda (2015) concludes that the preposition *at* is classified in prepositions, but not in other categories such as verbs or adverbs. By contrast, for example, the preposition *near* and *over* may be in other morphological categories. The preposition *at* contains semantic content about spatial scenes (proximity, contact), temporal sense, emotional states, scale sense or estimated sense, among others (see table 11).

Table 11. A summary of accounts of the preposition *at*:

In Herskovits (1986), the preposition *at* refers to two points (cross each other in space): 1) projected onto the object. 2) An immobile location.
In Navarro i Ferrando (2002), the procedure of a representation is: 1) Functional front of a TR. 2) Functional aspect of LM. 3) Contiguity of TR and LM (*At* does usually not connote contact). 4) Interaction of TR and LM. 5) Directionality. 6) Active zones. 7) Scale.
In Navarro i Ferrando (2002), *at* may indicate three dimensions: 1) A topological coincidence pattern. 2) A functional pattern of usage or manipulation of LM by TR. 3) A force-dynamic pattern (horizontal axis by the frontal position of TR). 4) A relation of two participants on the same level whose active zones are functional front (TR) and an accessible side (LM).
In Knaś (2007), the primary sense mentioned is a point of reference (1 dimension; internal or external). There are other senses such as the part-whole sense (*at the edge*

of the woods), scale (*at 2000 meters*) or dynamic (*a tall man is aiming a dart at the bull's eye*).
Brenda (2015) indicates that the preposition *at* is classified in the category of prepositions, but not in other morphological categories such as verbs or adverbs. *At* contains semantic content about spatial scenes (proximity, contact).

3.2 The prepositions *At* and *By*

Concerning the polysemy of prepositions, Deane (1993) focuses on the related meanings of prepositions in specific contexts, but these prepositions are not perfect synonyms because they introduce semantic nuances. Some examples are the prepositions *at, by, to* and *past.* In some contexts, the prepositions *at* and *to* are synonymous as well as *by* and *past*.

Here, there are some examples of these prepositions which indicate directions oriented toward contact with the LM (*at, to*) and directions toward one side of the LM (*by, past*):

1) They looked *at* the house.
2) They looked *to* the house.
3) They looked *by* the house.
4) They looked *past* the house.

The prepositions *to* and *past* occur with verbs of movement. In these sentences, *to* is associated with reaching a location, whereas *past* expresses continuing further. For example, *they ran to the house. They ran past the house.* In the same situation, *by* and *past* have associated meanings of movements, *to* means that the location is reached and *at* means that the location is approached. There are some analytical approaches, *at* as a locative, *at* describing spatial coincidence or as an approach.

Deane (1993) has explained the semantics of spatial prepositions, exemplifying the hypothesis of semantic regularity in a multimodal image theory approach. There are three types of spatial images, each with a different modality:

- *Visual space images* represent spatial relationships, including visual separation and angle of view to interpret visual information in spatial terms. In the visual mode, the position is seen in proportion to the line of vision (the path along which one views something).

- *Manoeuvre space images* convert the necessary information for the motor control, including the distance or clearance between objects or the movement of one object to another by hand, meaning moving one object to another by

carrying it. In this frame of reference, the position is seen relative to the surface of a reference object.

- *Kinetic space images* find the information to calculate force-dynamic interaction, conceptual paths, direction of movement or resistance to impact. There is a dynamic frame of reference in which the up and down dimension is described by gravity, and the forward-back dimension by the orientation and movement of a reference entity (speaker).

There are two principles to see polysemy and lexical irregularity about the spatial meanings of prepositions. 1) Images that define a preposition also define its meaning and provide a prototype as a *preference rule*. 2) Irregularities and gaps are considered to underline the difference in meaning.

The images contain some elements, which are:

For example, type of image (kinetic space), the preposition *at*, a moving object (TR), a reference object (LM), the path along which it moves, and an interaction zone around the LM where the TR interacts with it (Correa-Beningfield, Kristiansen, Navarro-Ferrando & Vandeloise, 2005: 358).

A preposition may be used with a verb of motion or orientation in two ways. One way implies a path in kinetic space, and the other is with a direction of displacement in a space in which it is possible to manoeuvre (Deane, 1993). There are similarities between *by* and *past*, and *at* and *to*, since they describe similar directions.

The preposition *past* focuses on an endpoint sense since it describes a location along a path in kinetic space. The preposition *by* does not focus on an endpoint sense because it is defined in manoeuvre space. A static location is defined by kinetic space images and has an endpoint sense. *At* and *by* define relations in manoeuvre space and clearance from the LM, whereas *to* and *past* lack clearance senses and they do not define relations in manoeuvre space. Manoeuvre space images always require a surface to define horizontal and vertical reference dimensions, and with the use of *at* and *by*, the TR may orient itself to ceilings or walls.

With regard to spatial senses (Knaś, 2006), abstract senses can also be determined, adding casual, quantitative or temporal senses. For instance, casual use in *the children all laughed at his jokes*; quantity is seen with *old books selling at 10 cents each*, and time with *my husband works at night.* However, despite not having a general agreement for the number of senses of *at* or for any other preposition, cognitive linguists have a common opinion that each preposition represents a network of related prepositional senses, with prototypical and peripheral members. Sometimes, this category membership varies in saliency for the senses in unclear boundaries at the periphery.

Proximity relations can be identified by the preposition *at* or *by*. The option of choosing one or another is not random. The use of *by* is assigned to (Knaś, 2006):

- A TR facing to the side related to the LM
- Next to the LM

Whereas the use of *at* is assigned to:

- A TR in a front location towards an LM
- An imprecise location of a TR related to an LM
- The speaker may be distant (imprecision)
- An LM as a reference point

Two distinct uses are named internal and external proximity (Knaś, 2006). For example, a) *Peter is standing at the school*. b) *Sam is at school*. The first one is outside the LM and the TR is not within the LM so that it is called external proximity. In the second one, the TR is inside the LM *school*, without a specification of the internal proximity.

In external proximity, function parameters, a frontal part, the degree of precision and animacy are regarded. Thence, function concerns interaction, a frontal part refers to the orientation, the degree of precision refers to the distance from the observer, and animacy refers to a TR that is animate or inanimate. When two or three dimensions are determined in an LM, the preposition *at* refers to a front part, and the preposition *by* refers to a side. When one dimension is determined in an LM, both prepositions *at* and *by* do not refer to the front part or a side but to a point of reference.

Therefore, two dimensions refer to a horizontal or vertical orientation, surfaces or flat objects (Knaś, 2006): *he stood at the blackboard; she is standing at the window*; three dimensions refer to vertically, horizontally and diagonally: *he was sitting at the table; Sarah is working at the computer;* one dimension refers to a line or which is the same a strip: *he parked the car at the roadside; we were at the seaside for a few days.*

In the internal proximity (Knaś, 2006), the TR is included and coincides with the LM, but it is not being contained. In one-dimensional LMs (*Joan's at her grandma's*; *I'll meet you back at your flat; we spent a day at the coast)* the TR is somewhere and it is not important or detailed as to where it is located; in two-dimensional LMs (*I'll meet you at the football ground; the police are investigating a fire at the farm)* the location of the TR is not detailed, and the two-dimensional LM can also be reduced to a point; in three-dimensional LMs (*tickets are available at box office; Hugh's at college in Swindon*; *the car's still at the garage*) the function of the TR is important for the description of the meaning.

In short, proximity is the main feature present in both prepositions *by* and *at* (Knaś, 2006). The parameters of function, the frontal position, precision, animacy or dimension are relevant with the preposition *at.* When only proximity occurs, *by* may replace the preposition *at.* These prepositions are interchangeable in this context.

The use of the preposition *at* is interesting because of some reasons (Kokorniak, 2007: 41-45): an analysis of *at* presents the relation between a TR and the specificity of an LM. The distinctions of senses depict a representation of the primary sense, the concept

of construal and the functional component. Lastly, each example shares one feature with other related examples so that these features are structured in the state of resemblance.

Kokorniak (2007: 42-44) shows some examples taken from Vandeloise (1991) where the preposition *at* may indicate contact or part of inclusion, but the topological dimension is not relevant. In fact, the relevant aspect is the configuration of a TR and an LM. The preposition *at* denotes asymmetry between a TR and an LM from an intrinsic frame. This means that the reverse relation is not possible.

For example, *Jean is at the blackboard* is correct, but **the blackboard is at Jean* is not correct. Here, the LM indicates the position of the TR, indicating a point of reference. In most cases, *at* signals a function of the TR and the LM. For example, *she is at the coffee machine*. Here, she is standing at the machine because she wants to prepare a coffee.

In some contexts, the preposition *by* can be substituted by *at* if an LM forms an edge. Kokorniak (2007: 118-122) suggests that this distinction is not meaningful. For example, *he had to stop at/by the roadside to recover*. In terms of contact, the preposition *at* may be seen as having no distinction between absence or presence of contact, and the preposition *by* may express the absence of contact. For example, *he had a picnic at the beach*. *He had a picnic by the beach.* Here, using the preposition *at,* the picnic may take place on the beach or also next to this area. The lateral side is not indicated with *at*. Using the preposition *by*, in the opposite case, the picnic does not occur on the beach but in the area close by. The TR is located close to the lateral side of the LM, that is, the right side or left side. In this respect, an exchange of the preposition *by* in place of *at* may be questionable from a point-like LM because of the meaning change. For example, *they met at the corner of West Street and Park Street.*

In short, the acceptance of the preposition *by* in place of *at* needs a consideration of the dimensions of the LM (Kokorniak, 2007: 120-122). The most acceptable structure, in this exchange of preposition, forms an edge or boundary from the LM, which is a one-dimensional edge. The least acceptable structure forms a reference point in the LM as a one-dimensional point. The uses of the preposition *at* entail being an observer from a distant view. The function or purpose of the LM is another relevant aspect for using *at*. The preposition *by* entails an observer at the scene who focuses more on the details (see table 12).

Table 12. A summary of the contrast between the prepositions *at* and *by*:

There are three types of spatial images (Deane, 1993): 1) visual space images (visual information). 2) Manoeuvre space images (motor control information). 3) Kinetic space images (force-dynamic interaction).
In Knaś (2007), there are some abstract senses such as casual (*at his jokes*),

quantitative (*at 10 cents*) or temporal (*at night*).
In Knaś (2007), the preposition *by* presents a TR facing the side of the LM, or next to the LM. The preposition *at* presents a TR in a front location towards an LM. A location without precision of a TR related to an LM. The speaker may be distant (imprecision). An LM as a reference point. Internal (*at the college*) or external proximity (*at the computer*).
In Knaś (2007), there are 2, 3 dimensions in *at* (refers to a front part), and in *by* (refers to a side). There is one dimension in *at* and in *by* (not referring to the front part or side but a point of reference). In 2 dimensions: horizontal, vertical orientation, surfaces, objects (*at the window, at the blackboard*). In 3 dimensions: vertically, horizontally, diagonally (*at the table, at the computer*). In 1 dimension: a line (*at the roadside, at the seaside*).
In some contexts, the preposition *by* can be substituted by *at* if an LM forms an edge. Kokorniak (2007: 118-122) an exchange of *by* in place of *at* may be questionable from a point-like LM because of the meaning change.
The function or purpose of the LM is another relevant aspect for using *at*. The uses of the preposition *by* entail to have an observer through the scene who focuses more on the details (Kokorniak, 2007: 120).

3.3 The preposition *Beside*

According to the Cambridge dictionary, the English Oxford dictionary and the Merriam Webster dictionary, the first definitions of *beside* are the following:

Cambridge dictionary:
1. ***At the side of, next to****: come and sit here beside me.*
2. ***Compared to*** *another person or thing: those books seem very dull beside this one.*

English Oxford dictionary:
1. ***Next to or at the side of*** *somebody/something: he sat beside her all night.*
2. ***Compared with*** *somebody/something: my painting looks childish beside yours.*

Merriam Webster dictionary:
1. ***By the side of****: walk beside me. A house beside a small lake.*

2. ***In comparison with****: potential complications are minor beside the benefits.*
3. ***Not relevant to****: but that's beside the point.*

According to Rissanen (2004), the preposition *beside* and the adverb *besides* have developed different kinds of meanings through the last centuries. Rissanen explains the evolution by which the meanings of these words are now understood taking into account their development from their earliest uses. Mainly, the preposition *beside* has evolved in grammatical aspects, such as the difference between the preposition and the adverb. The main focus of location is indicated by *beside*, whereas the abstract uses are indicated by *besides.* The author notes that the semantic organisation of these two forms, preposition and adverb, was indifferent and unclear for both uses in previous times.

In Middle English, *beside* and *besides* describe any animate or inanimate entity and abstract senses in an identical construction (noun, verb and complements). In the fourteenth century, dictionaries demonstrated the evolution of specific and abstract examples. The basis of extension of meaning may connect the subjective and physical points of view as in someone viewing someone or something. Providing a point of view is situated in a neutral position or the exterior, the notion of *side* means someone or something located near an object or a person presented *beside* and *besides*. If the connection is determined by a concrete point of view, a distance or a movement indicates this extension of meaning. Thus, abstract meanings appear in some sentences such as in the meanings of *except*, *outside* or *in addition*.

Referring to Modern English (Rissanen, 2004), the diversity of examples with abstract senses has increased from the sixteenth century to the present. Specifically, these abstract and prototypical examples have been appearing more often than the specific senses or non-abstract senses. Moreover, the use of the shorter form *beside* has extended in an unexpected usage from the nineteenth century to the present. These meanings are *removal, deprivation, out of or away from.* The highest amount of syntactic and semantic modifications occurs in the initial period of the development of Modern English. Later on, in the Modern English period, the difference between these two notions (*beside* and *besides*) increased. The form *beside* refers to the local senses and *besides* to abstract senses. In the grammatical sense, the evolution of *beside(s),* which refers to the preposition *beside* and the adverb *besides,* is included in the same group as *before*, *until,* and even have some connections with *except*, *because* or *despite*.

In short, according to this author, the preposition *beside* indicates the location of an object or a person in a close position to a place. The TR may be an animate or an inanimate entity. The grammatical aspect of this preposition has evolved in dictionaries up to today. The development of this preposition is reflected in dictionaries as the semantic organisation between the preposition and the adverb. Although abstract senses appear in more contexts in Modern English, these senses are seen as prototypical senses. However, the use of *beside* may also appear in non-abstract senses. Thence, the prepositional form of *beside* is used more often than the adverb *besides*.

Coventry et al. (1994) show the use of *in*, *on*, *over* and *beside* in an experiment. The participants watched some videos and described the scenes with these prepositions. After the analysis, their judgments were that the preposition *beside* is often used with a jug and glass that contain liquid instead of an empty jug or glass. The use of this preposition did not usually vary in scenes with a jug and glass containing liquid in contrast to a representation of an orange and a jug. Thence, the spatial language may be in equilibrium with space and functionality. In the representation of a model, this specific function has an effect such as accessibility or interaction in a scene with a specific object (see table 13).

As shown in Zwarts & Gärdenfors (2016), the preposition *beside* carries the meaning of a location in a spatial proximity which extends from a TR to the sides of an LM and is similar to the preposition *near*. The preposition beside in different structures is restricted to that of a projective (or axial) preposition. These beside uses have unique features that are not relative to a convex or rounded surface. They do not include a vertical orientation such as other projective prepositions (above and below).

The prepositions *beside* and *alongside* can describe places and paths, not in contact with each other (Lindstromberg, 2010: 81-88). The composition of *beside* refers to *by the side* where a TR is near an LM to the right or the left.

Along does not refer to how close in space the paths are located to each other, but it refers to motion in a constant direction. However, *beside* tends to imply proximity or nearness to one side but not contact. For example, in the sentence *all the chairs should be beside the wall*, *beside* suggests that the chairs are near the wall, but not necessarily in a regular line position or contact. Nevertheless, they have to be reasonably in line with each other to qualify as all being *beside*/*near the wall* to the same extent.

Beside indicates not having contact with something and not being contained within something. For example, the expression *(be) beside yourself with anger* means that you are so angry that you do not have the same personality. This is simply a figure of speech that does not represent a spatial relationship.

Regarding the right or the left position (Vandeloise, 1986: 123, 134; Vandeloise, 1991: 110-115), a speaker's right or left is decided by the orientation of the speaker's shoulder and with the field of vision or the line of movement. This field of vision suggests objects located in an intrinsic orientation frame such as vehicles, houses or ships. For example, *the majestic... purple mountain chain appeared on our right in the distance, still some 20 miles away.* Here, there is visual contact with the mountain chain in the distance. In British English, for example, the expressions *to/on [the] left-hand side (of)* are usual when there is a small distance between the TR and the LM.

Table 13. A summary of the preposition *beside:*

The grammatical aspect of the preposition *beside* has evolved in dictionaries up to today (Rissanen, 2004). The TR may be an animate or an inanimate entity, indicating a location of an object or a person in a near position to a place.
In contexts of Modern English, abstract senses appear more often, and these senses are seen as prototypical senses. However, the use of *beside* may also indicate non-abstract senses. Thus, the prepositional form of *beside* is used more often than the adverb *besides.*
In the grammatical aspect, the evolution of *beside(s)* is included in the identical group as for example, *before*, *until*, and even have some connections with *except*, *because* or *despite*.
The spatial language may be in equilibrium with space and functional value. This specific function has a meaning in a scene with a specific object to represent a space (Coventry et al., 1994).
The preposition *beside* has a meaning of a location in a spatial proximity from a TR to the sides of an LM and is similar to the preposition *near* (Zwarts & Gärdenfors, 2016). These uses of the preposition *beside* are not in a convex or rounded surface.
The preposition *beside* can describe place and paths without being in contact. The beside composition refers to by side in a place where a TR is near an LM to the right or left (Lindstromberg, 2010: 81-88).

3.4 The preposition *By*

According to the Cambridge dictionary, the English Oxford dictionary and the Merriam Webster dictionary, the first three definitions of *by* are the following:

Cambridge dictionary:
Agent: *used to show the person or thing that does something (the motorcycle was driven by a tiny bald man).*
Method: *used to show how something is done (they travelled across Europe by train/car).*
Position: *near or at the side of (a small child stood sullenly by her side).*

English Oxford dictionary:
1. *Identifying the **agent** performing an action (the door was opened by my cousin Annie).*
2. *[Often with **verbal noun**] indicating **the means of achieving** something (malaria can be controlled by attacking the parasite).*
*3. Indicating the **amount or size** of a margin (the shot missed her by miles).*

Merriam Webster dictionary:
1. *In **proximity** to: near (standing by the window).*
2. *Through or **through** the medium of: via (enter by the door).*
3. ***During the course** of (studied by night); not later than (be there by 2 p.m.).*

Dirven (1993: 80), Lindstromberg (2010: 148), and Quirk et al. (1985: 687) gather the metaphorical senses of *by* which means not spatial senses of *by*:

- Sense of agency (e.g., *a book by Johnson*)
- Sense of cause (e.g., *surprised by his appearance*)
- Sense of manner/instrument (e.g., *travel by plane*)
- Sense of means (e.g., *send it by email*)
- Sense of circumstance (e.g., *by accident*)
- Sense of professional (e.g., *a lawyer by profession*)
- Sense of incident/secondary importance (e.g., *by the way*)
- Sense of rate (e.g., *rising by 10 percent a year*)

Langacker (1987, 1991, 2008) and Brenda (2017) made it clear that English speakers use prepositions such as *at, beside, by, near* and *next to* that encode the concept of a proximity schema. The explanation of these prepositions is given below:

- The preposition *by* indicates proximity, horizontal directions, a closer object than *near*, a presence in the vicinity of an object in an unspecified horizontal region, being near or moving near.
- The preposition *near* indicates horizontal and vertical directions, oblique or inclining, and a closer perspective than *at* (when using a general reference point).
- The preposition *next to* indicates horizontal directions in order or importance.
- The preposition *beside* indicates nearness to one side of an entity and horizontal directions.
- The preposition *at* indicates a distant perspective.

The most common sense of *by*, the agency sense, appears in passive sentences that introduce a creator of the action in a passive sentence. The passive voice is used in sentences by referring to an agent using the preposition *by*. An agent that includes the subject of the sentence and initiates the action, and a patient (a receiver) that is the object of the sentence receives the energy of this action. A TR receives an action in passive construction, and an LM is a creator or participant. For example, *a curfew*

imposed by the government is still in effect. Here *a curfew imposed* is the TR in passive construction, and *the government* is the LM as a participant (Langacker, 1991).

Additionally, some fixed expressions may be mentioned, such as *by the way, by no means, by far, by and large, by contrast, by virtue of, by the same token, by all means or by the by.* This preposition is usually used in such expressions to refer to an adverbial clause or locution. Prepositions differ from adverbs in having two entities, the TR and the LM, whereas adverbs have only one entity and do not add an LM in a sentence (Langacker, 2008).

Some examples of the preposition *by* and the correspondent senses are the following ones (Lindstromberg, 2010: 146-150; Quirk et al., 1985: 687-713):

- The primary sense is In-the-vicinity sense: the object may or may not be in contact.
- In the primary sense, motion may be included: motion without stopping at a point of the LM or an intermediate stop (e.g., *she needed to go by the bank*), (Lindstromberg, 2010).
- The distance sense may be included in the primary sense: a path and endpoints (e.g., *come in by the first door on your right*).
- In the primary sense, amount may be included: a space and scale of time, such as numeral scales, e.g., *by two per cent*.
- In the amount sense, the sequence sense: a sequence of objects such as *one by one* or *step by step.*
- The agency sense: the passive constructions, an agent and a participant, a TR and an LM.
- The contact sense: a contact schema between a TR and an LM (e.g., *take a pan by its handle*).
- The alone sense: without any help, referring to *by itself* or *by myself.*

In this respect, Cuyckens (1999: 16-20) provides some examples of the preposition *by* with special consideration of the passive voice:

a) Go stand by that tree so I can take your picture (proximity).
b) I drove by the school on my way to work (proximity and past).
c) She came in by the back door (through).
d) We went home by train (means).
e) The policeman was viciously attacked by two hooligans (passive marker).

In these examples from above, the lexical uses of *by* (a-d) and the grammatical use of *by* in the passive voice (e) may not be related and may be homonyms. In semantic analyses, the passive voice and the other uses of *by* are related in a few cases, such as in Langacker (1991: 139-140). In his study, Langacker tries to incorporate the passive use of *by* in the same network with other uses of *by*. For example, current relations of TR and LM by Langacker are:

a) *The willow tree is by the river.*
b) *That's OK by me.*
c) *That sculpture is by Zuniga.*
d) *Bragging by officers will not be tolerated.*

In the first two examples (a-b), the relation of TR and LM is a proximal relation. In the third and fourth examples (c-d), the relation of TR and LM is seen in another sense that is in face-to-face relation.

Cuyckens (1999: 16-20) proposes two types of path that are used in the uses of *by*: the first type is from *by* as a *path along a course* (as means) to *by* as a passive agent, and the second type is from *by* as proximity to *by* as a passive agent. In his conclusion, the author notes that the sense of *by* as a path of development is more reasonable for a semantic representation than *by* as being in a path (see table 14).

Table 14. A summary of the preposition *by*:

The preposition *by* refers to proximity and horizontal directions (closer than near). A presence in the vicinity of an object in an unspecified horizontal region and from a distant perspective (Langacker, 2008; Brenda, 2017).
The agency sense is prevalent in the passive constructions, indicating an agent and a participant, a TR and an LM (*a curfew imposed by the government is still in effect*).
In semantic analyses, the grammatical use of *by* in the passive voice and the lexical uses of *by* are not often related. However, in a few cases, such as Langacker (1991: 139-140), the uses of *by* may be related in a network. Langacker tries to incorporate the passive use of *by* with other uses of *by* in the same network.

3.5 The preposition *Near*

According to the Cambridge dictionary, the English Oxford dictionary and the Merriam Webster dictionary, the first two or three definitions of *near* are the following:

Cambridge dictionary:
1. Not far away in distance *(I'd like to sit near a window, please).*
2. Almost *in a particular state, or condition (the runners looked near exhaustion. I was near tears (almost cried) at one point during the film).*

English Oxford dictionary:
1. At or to ***a short distance away from (a place):*** *the car park near the sawmill. Do you live near here?*
2. ***A short period of time from:*** *near the end of the war.*
3. ***Close to (a state); verging on:*** *she gave a tiny smile, brave but near tears.*

Merriam Webster dictionary:
1. ***Close to*** *(beaches near the city).*

In the Oxford English dictionary (1989), the word *near* is labelled as an adverb and a preposition, later as an adjective and a verb. At the beginning of this relation, both prepositions and adverbs go back to Proto-Indo-European, demonstrating the lack of prepositions in Proto-Indo-European (Saussure, 1959). When the order of certain adverbs changed with a connection to a noun, the prepositional class developed (Lundskær-Nielsen, 1993). Concerning grammar, an attempt was made to classify the two word classes, prepositions and adverbs, in a unified class (Jespersen, 2013). Thus, the boundaries of prepositional and adverbial categories are fuzzier than traditional grammarians pretend (Quirk et al., 1985).

O'Keefe (1996: 281) indicates that the main role of prepositions is to determine these spatial relations in various places and objects so that specifications of movements and changes are seen in relations represented by vectors or directions.

In terms of distance, for example, *near* and *far from* refer to relative distances dependent on contexts (O'Keefe, 1996: 294). These points and directions from a distance are not the same geometrical dimensions, and these points are open to a variation through these three dimensions. The relation *near/far* relates to entities of two dimensions and three dimensions indicates that the surface points are relevant instead of other aspects.

In representing horizontal positions (O'Keefe, 1996: 296), locative prepositions present places by means of distances and directions and are also common in vertical positions or planes. The horizontal directions and courses need to have close coordination with each other. Prepositions indicate relations in places, measures, directions or even a combination of these relations. Static locative prepositions connect two or three objects, and static directional prepositions connect three objects because of the initial direction. In the vertical plane, a direction is given by the motion created by gravity, whereas in the horizontal dimension, the direction is determined by the relative positions in relation to something else or a comparative object.

Even though the classification of prepositions and adverbs is a questionable matter in grammatical terms, both indicate atemporal relations. They may be distinguished in connection with TR and LM (Langacker, 2008; Brenda, 2017). Thus, adverbs include one focal participant, the TR, while prepositions include the TR and the LM. As a sample, *an attractive girl in jeans hovered near*; here *near* locates the girl, giving

prominence to the TR. In the expression, *Europe's centre near Geneva*, Europe's centre is the focal prominence or the TR, whereas Geneva is the secondary prominence or represents the LM status. Then, in this case, *near* includes a TR and an LM.

The earliest evidence of the word *near* dates back to the 9th century, and then, this word became embedded in the English language (the Oxford English dictionary, 1989). In Middle English, the word *near* continued to be used, and the combined preposition *near to* also emerged. Later on, the adjective and the verbal extension began to occur (Brenda, 2017).

According to Brenda (2017), the preposition *near* and the complex preposition *near to* include five distinct senses in the semantic network. These are *In the vicinity, Approach, Interaction, Temporal senses* and *Approximately*. The primary senses encode the spatial relation between two objects (Cuyckens, 1993; Cuyckens & Radden, 2002; Tyler & Evans, 2003). The speaker organises a concrete construal relation with the observed scene to communicate this relationship. This speaker/writer will delineate a schematic scene focusing on the chosen aspects and adding prominence to them.

Interpreting a spatial scene concerns the aspects of specificity, focusing, prominence and perspective (Langacker, 1987, 2008). Thus, the fundamental sense activates various domains in the human conceptual system, such as an object, space, spatial relation and proximity. The users present a sort of prominence to a knowledge structure of one entity near another. This proximity schema may be specified by spatial expressions such as *by, near to, beside* or *around*, and even the near schema by the preposition *near*. In a proximal relation, one object is given more prominence as the TR, and the other one is the LM in the background.

Although not all the content takes part in the association converted by the linguistic expression, the active zone (Brenda, 2017) is the part of a given entity participating in that relation. For example, the variation within an active zone or profile concerns a type of metonymy. Then, the differences between the prepositions *near* and *at* may be useful to clarify divergences as *Europe's centre near Geneva* versus *Europe's centre at Geneva*. Here, the preposition *near* chooses Geneva as an active zone of its LM, which is the side of the city near the centre, whereas the preposition *at* is considered to represent a more significant distance between the spatial scene and the observer. Then, with the use of *at*, the LM is a precise city in a particular area where the TR performs a function.

Moreover, perspective is an aspect of construal, designating a viewing arrangement that refers to the relation between the viewer and the scene. Then a vantage point includes the speaker viewing the scene from a distance and situated "off stage". The preposition *near* includes only the off-stage vantage point. In the construal, some changes are the image schema transformations (object, near-far, path, and goal).

An innovative sense is found when the prepositions locate a new geometric formation between a TR and an LM or a new metaphorical meaning (Tyler & Evans, 2003). The

primary sense of the preposition *near* is In-the-vicinity which contains an object, and a near-far image schema, together with the centre-periphery and scale schemas to determine the distance (Johnson, 1987).

As a topological preposition (Brenda, 2017), *near* does not consider the actual distance of a spatial relation determined by the Euclidean metric. In contrast to projective prepositions, topological prepositions are not based on the observer's viewpoint. Then, all the senses of *near* include a vantage point and the orientation of entities. The viewer is in an off-stage position, and the viewer's viewpoint is subjective (Langacker, 2008). The perception is a symmetrical relation where a TR is near the LM, and the LM is near the TR, too.

In addition, the difference between *near* and *by* resides on the lack or presence of contact and a connection between a TR and an LM essentially (Lindstromberg, 2010). However, the contact between a TR and LM cannot be prevented in small objects and small scales (Brenda, 2017). The following example suggests that a man is in the vicinity: *sometimes, when he had been sitting near the side of the boat.* Here, it is possible that a man is either leaning against the lateral side of this boat or sitting a short distance away.

The preposition *near* decides its search domain establishing a determined region surrounding the LM where to search for the TR. The TR is involved within this region and may also be in contact with the LM on some occasions. The preposition *near* is neutral concerning the orientation of the LM while indicating a profile or the active zone discrepancy.

The preposition *by* in its fundamental sense, concerns the TR's proximal position only in the horizontal plane, unlike *near* which also concerns the vertical plane. This relation between a TR and LM of *by* may involve the two objects either being in contact or in an interaction with one another. The prepositions *next to* and *beside* also relate the spatial structure in the horizontal plane. *Next to* inspires a sequential organisation of a TR and LM without any object intervening in between. *Beside* may be rephrased as "by the side of, close to" and normally excludes contact between the TR and LM (OED, 1989; Lindstromberg, 2010). Thus, small objects (a fork, a knife) located one metre apart would be surely denoted as being far from one another, whereas large objects (a ship and a sailboat) would be recognised as particularly near one another.

Considering other senses (Brenda, 2017), concretely, the interaction sense, image schemas may be metaphorically enlarged to help us organise the meaning of the sense. For instance, in specific frameworks, a geometric connection of proximity between people may occur in a feeling of friendship and familiarity. The interaction sense with the preposition *near* is used with verbs connoting motion (*come, go, get*) or permission (*let and allow*), such as *on no account let that charlatan near me!* (Hesitant to come into contact, but physical proximity) *He is the only person who could have got near the animal* (metaphor of familiarity).

In the Approach sense, the proximity connoted by *near* may be interpreted in situations where people are coming closer to a particular physical, emotional or conceptual state. As *check that all the wedding clothes are near completion*, the TR is the wedding clothes, and the LM is completion, which means the desired state in a spatial location (not in the completed phase yet but near it, metaphor to illustrate a change of emotion).

In the Approximately sense (an extension of the Approach sense), the path and scale schemas (number, amounts, degrees of intensity) are more in the foreground than in the Approach sense. This means a *close approximation* or *near* approach, such as the adverb *nearly* (OED, 1989). The concept of scale of *near* is construed with a high resolution, unlike the scale of the preposition *at* which is a low resolution with coarse-grain constructions, a broader view and the TR is at a particular point (*these experiments had to be performed at 37 degrees Celsius*).

In the sentence *as growth in France's economy slows to an expected 2 per cent this year after two years near 4 per cent*, the LM is 4 per cent, and the TR is the growth in France's economy, which indicates the growth at approximately 4 per cent. In the sentence, *my earlier estimate of around six hours will be somewhere near the mark*, the approximation of the temporal domain is a metaphor, that is, time as space and temporal units as locations.

In the temporal sense, space units do not move objects, and these units are not always on the same path, whereas units of time may be in motion or motionless on the same timeline. This sense is an extension of the In-The-Vicinity sense, also used by temporal phrases such as *morning, end of September, or beginning of the century*. In this sentence, *it was getting near Christmas and we were both under pressure to get orders completed*, the TR is the pronoun it, which refers to the human experience moving towards the holiday, and the LM is Christmas represented as a stationary event.

Moreover, referring to the primary sense of the preposition *near to* (Brenda, 2017), the preposition *to* presents the path, specifically, the end of a path and the directionality meaning components to the semantic structure of the complex preposition *near to*. In this context, for instance, *Where's the fresh meat we were promised? A man standing near to Ruth called out.* The preposition *to* highlights the endpoint of a path linking this man and Ruth.

The conceptual combination analysis of *near to* mentioned above suggests that the primary sense of *near to* incorporates semantic structures from the prepositions *near* and *to*, mental spaces proposing an approached structure with one object proximal to another and positioned at the end of a path (see table 15).

Table 15: A summary of the preposition *near*:

Adverbs include one focal participant, the TR, while prepositions include both the TR and the LM (Brenda, 2017: 1-12).
Interpreting a spatial scene concerns specificity, focusing, prominence, and perspective.
An aspect of construal is perspective: a viewing arrangement (relation between the viewer and the scene) and a vantage point (position of the speaker viewing the scene from a distance, off-stage).
Topological prepositions are not based on an observer's viewpoint. All the senses of *near* include a vantage point, the orientation of entities, the viewer (placed in an off-stage position) and also with a viewer's viewpoint (subjective), and a symmetrical relation (Langacker, 2008).
A main difference between *near* and *at* appears in *Europe's centre near Geneva* versus *Europe's centre at Geneva*. Here, the preposition *near* chooses Geneva as an active zone of its LM (the side of the city near the centre), whereas the preposition *at* represents a considerable distance between the spatial scene and the observer.
The distinction between the preposition *near* and *by* remarks on the lack or presence of contact and a connection between a TR and an LM.
The preposition *by*: the horizontal plane. This relation between a TR and LM of *by* may involve contact or an interaction with one another. *Near* also concerns the vertical plane. The prepositions *next to* and *beside* also relate to the spatial structure in the horizontal plane.
Next to inspires a consecutive organisation of a TR and LM without any object intervening in between. *Beside* may be rephrased as *by the side of, close to*, and normally excludes contact between a TR and an LM.
The difference between small and large objects: Small objects (a fork, a knife) located one metre apart would be undoubtedly described as being far from one another. In contrast, large objects (a ship or a sailboat) would be recognised mainly as being near one another.

3.6 The preposition *Next to*

According to the Cambridge dictionary, the English Oxford dictionary and the Merriam Webster dictionary, the first three definitions of *next to* are the following:

Cambridge dictionary:
*1. Used when describing two people or things that are **very close to each other** with nothing between them (can I sit next to the window?).*
*2. Used to mean `**after**' when making a choice or a **comparison** (cheese is my favourite food and, next to that, chocolate).*
*3. **Almost** (they pay me next to nothing (very little) but I really enjoy the work).*

English Oxford dictionary:
1. *In or into a **position** immediately to one side of; **beside** (we sat next to each other).*
*2. **Following in order** or importance (next to buying a new wardrobe, nothing lifts the spirits like a new hairdo!).*
*3. **Almost** (I knew next to nothing about farming).*

Merriam Webster dictionary:
1. *Immediately following or adjacent to; **beside** (I sat next to my friend).*
2. *In **comparison** to (next to you I'm wealthy).*
3. ***Following right after** (I'd say next to chocolate, strawberry ice cream is my favorite).*
A proximity image schema is expressed by *at, beside, by, near,* and *next to* that encode horizontal directions (Langacker 1987, 2008; Brenda, 2017, 2019). The preposition *next to* refers to horizontal directions between two points, objects or persons.

Concerning the uses of *next to*, Brenda (2019) discusses the meaning of proximity, adjacency, a linear order of objects and sequence in the spatial relations of *next to*. The study presents a primary meaning of an adjacency sense (the location of two adjacent objects) in a spatial relation compared to other abstract senses such as a comparison, an addition, a scale or an almost sense. As there is an evolution in the uses and the frequencies of these words, there is a specific content of meaning in the case of next to. Thence, the uses of *next to* suggest a limited semantic structure as it involves only a few meanings in specific content.

The prepositions *next to* and *beside* relate to the spatial representation between a TR and an LM in the horizontal plane (Lindstromberg, 2010). In using the preposition *next to* it is usually understood that the TR and the LM are in a spatial relation such that no other entity is situated between them. They are organised in a logical sequence.

Beside carries the connotation “by the side of” or “close to” and normally excludes contact between the TR and LM (Lindstromberg, 2010). This preposition carries the concept of proportionality regarding the distance between the TR and the LM relating to size. Thus, for example, small objects such as a knife and a fork, if set one metre apart, they would appear to be quite far from one another. However, large objects such as a

ship and a sailboat would, at this distance, be unusually and dangerously close to one another. Such large objects could be said to be “close to” one another if there was a distance of two thousand metres between them (the objects, obviously, set the parameters as to what is regarded as “close to” one another. For example, two skyscrapers can be within metres of each other). (see table 16).

Sowden & Blades (1996) indicate that there are three points to consider, which are the form of an object (regular or irregular), the dimensional aspect (two- or three-dimensional) and also a classification of abstract senses, or those senses based on what is real or practical. These authors note several factors for comparing the results, such as the age, the location (*next to* or *near to*), the objects, the form of these objects or the reference object (abstract sense or real sense). Those objects which have an equivalent form are more likely located in such a way to be in a contact or touch sense than those that are irregular objects.

The results show that the instructions related to the preposition *next to* indicate more contact locations, that is to say touch locations, than those instructions related to *near to*. In that case, when the age increases, a reduction of contact locations appears in the placements of objects from those participants. The prototype of the preposition *next to* may be distinguished quickly at an initial stage, and similarly, the preposition *next to* is understood by both children and adults. The experiment shows that the placements of children may be estimated in a similar way to adults' answers in a small scale sample.

Table 16. A summary of the preposition *next to:*

The preposition *next to* refers to horizontal directions between two points, objects or persons. The representation of a proximity image schema is presented by the use of English language prepositions such as *at, beside, by, near* and *next to* that encode horizontal directions (Langacker, 1987, 2008; Brenda, 2017, 2019). Brenda (2019) discusses the meaning of proximity, adjacency, linear order of objects and sequence in the spatial relations of *next to*. *Next to* suggests a limited semantic structure as it involves few meanings in specific content. In using the preposition *next to* it is usually understood that the TR and the LM are in such a spatial relation that no other entity is situated between them. They are organised in a logical sequence (Lindstromberg, 2010).
The results show that (Sowden & Blades, 1996) the instructions related to the uses of the preposition *next to* indicate more contact situations, that is to say, situations in which objects et al. are in contact, than those instructions related to *near to*. Those objects with an equivalent form are more likely to be located in a contact or touch sense than those with irregular forms.

Chapter 4: Theoretical framework of this research

In this section, an overview of the theoretical framework outlines the principal parameters to consider in the analysis of prepositions (see section 1). At this point, I consider convenient it to go into detail about these fundamental parameters of my analysis in order to clarify their meanings.

As resolving how to use prepositions in a foreign language is particularly laborious, the principal dimensions are detailed to understand senses and specific meaning. Regarding the understanding of prepositions, questions regarding when and why prepositions are used are only answered up to a certain point in traditional dictionaries.

In general, dictionaries do generally not present reasons why a preposition is used in a given context, and Grammar books tend to state that a provided preposition such as *in* is used in a given phrase (*in my opinion*) or specify usage patterns by considering the contexts in which a preposition is used (Johansson Falck, 2018: 1).

Thus, some authors have proposed Cognitive Linguistics based approaches as an alternative to the traditional task of learning distinct contexts by heart. An organised network of related meanings refers to a representation of English prepositions with a gestalt, a conceptualisation of situations, or even scenes connected, rather than definitions in a dictionary list.

4.1 Principles of construal

Generally, meaning is related to conceptual content and a concrete way of construing this content (Langacker, 2008: 55-60). The notion of construal refers to perceiving and portraying a particular situation in more than one way. At a conceptual level, the content is seen neutrally, but a particular construal is imposed in linguistic terms. An example of this is a glass containing water that occupies half of the volume.

Thus, the semantic contrast offers four options: 1. *The glass with water in it* (container). 2. *The water in the glass* (the liquid it contains). 3. *The glass is half-full* (volume occupied by liquid). 4. *The glass is half-empty* (volume occupied by void).

Therefore, a direct bearing is proposed in the content**,** and expressions may differ in specificity, such as *the glass with water* versus *the container with liquid*. The first phrase has more meaning than the second one. The meaning consists of the construal, in addition to, any specific content primarily.

4.1.1 The study of perception

For the notion of construal and the Cognitive Linguistic perspective on prepositions, Navarro i Ferrando (2006a) provides an effectively developed model for the semantic

representation of prepositions whose senses are derived and organised concerning aspects of construal. Hence, three perceptual dimensions that can intervene in determining the spatial relationship are established between the TR and the LM (see section *2.4.2*), namely topology, force-dynamics and function.

Concerning perspectivisation (Taylor, 2005: 93-94), the distinct uses of a word whose semantic structure is rather complicated usually highlight the elements of frame-based knowledge. The word Monday refers to a position within the days of the week. For instance, my birthday falls this year on a Monday. I complain of a Monday-morning feeling. In the second sentence, it means that Monday follows after the weekend's leisure. Thus, the perspectivisation of a component does not simply background other components in a frame, but rather the other components are overshadowed.

In the study of perception (Varela et al., 2017: 72-74), a question arises: why should evolution occur? Evolution is not just progress but an alternative view of natural drift. An organism and the environment cannot be separate, and these are in evolution as a natural drift or movement. This evolution occurs in the colour spaces, surfaces, and the colour vision or spectrum. Perceiving organisms grasp different perspectives on the world. This sphere can be viewed from a diversity of vantage points.

Gibson's theory (1979) maintains two distinctive features. The first one is suitable for guided action in perception (*picking up* or *attending to*). This theory asserts that the world must be understood in a form that exhibits how this form creates environments for perceiving animals. In this view, specific attributes are obtained from the environment, not obtained in the physical world itself. The most notable attributes consist of what the environment supplies for the animal, which Gibson calls *affordances*.

In precise terms, affordances contain the opportunities for interaction, which the environmental things sustain relative to the animal's abilities. For example, relative to several animals, some entities, such as trees, are available to climb or to allow for climbing. Hence, affordances are essentially ecological points of the world.

In the second feature, Gibson proposes a theory of perception that describes how the environment is perceived. There is enough information in the surroundings to clarify the environment instantly, without any symbolic representation. Thus, there are no variations in the topology of surroundings that specify characteristics of the environment, including affordances.

In a nutshell, the main differences between Gibson's theory and Varela et al. (2017: 203-204) are that the environment is independent for Gibson and established for the latter. Perception is a direct detection for Gibson and a sensory-motor representation for Varela et al. The theory of perception develops through the environment for Gibson, whereas for Varela et al., it proceeds by detailing the sensory-motor patterns that allow for guiding action. This account of perception is significant, in such a way, because this study focuses on the terms of interaction and visual perception.

4.1.2 Perspective: Viewing arrangement

With regard to perspective (Langacker, 2008: 73-78), the viewing of space is a conceptualisation through a metaphor. The viewing arrangement is the perspective, including dynamicity. Thus, the relationship between the viewers and the scene viewed is named a viewing arrangement. In a conversation, the interlocutors are in a fixed position and observe and represent actual circumstances allowing them to discern the status of default cases.

A relevant component inside the viewing arrangement is a supposed vantage point. This is the actual position of the speaker and the listener. The same circumstance can be observed from distinct vantage points, proceeding in various construals. Thus, some aspects of the vantage point are assigned in Cognitive Grammar, such as objectivity or subjectivity (Langacker, 2008: 77-78). Then, the viewing arrangement maximises the asymmetry between the subject (also called the viewer) and the object of perception (also called what is viewed).

In linguistic purposes of perceptual asymmetry (Langacker, 2008: 78-79), the subjects are the speaker and the hearer, who perceive the meanings of constructions with maximal subjectivity and implicit or unquestionable reference. On the opposite side, the object of attention is focused on maximal objectivity with profiling and explicit reference.

In varying degrees, an extreme is the focus of attention used with the first-person (*I*) and second-person pronouns (*you or we*). Here, the speaker and the hearer are viewed, explicitly introduced and objectively construed. In other intermediate possibilities, the speaker and the hearer are not only the subjects but also viewers whose line of sight and vantage point are applied by *behind* or *in front of*. Then, the role is not entirely subjective, but neither is it fully objective and carries an implicit reference.

Another term is *ground*, including the speaker and the hearer, the speech event where they interact and the circumstances (time and place). Thus, the various aspects of the *ground* are part of the content, as objects of conception, and these are often profiled. The usual words are *now*, *here*, *I* and *you*, which put ourselves into a real interaction. The tense is recognised with *was*, *is*, or *will be*, as past, present or future through the speaking time. In an area, the comparison parameter is definiteness, between *the rock* (definite) and *a rock* (indefinite).

4.1.3 The dimensions of imagery

In addition to perspective (Langacker, 2008: 79-85), the temporal dimension (the linear order) is another relevant point. Time as the medium of conception is referred to as processing time which occurs through a period, being the time it takes to process something. Each conceptualisation requires a measure of time processing; even an instantaneous happening occurs within time and experiences a development on a small

scale. Thus, as an aspect of construal, dynamicity belongs to the development of conceptualisation through processing time on larger scales.

For instance, *your camera is upstairs, in the bedroom, in the closet, on the shelf,* or *your camera is on the shelf, in the closet, in the bedroom, upstairs.* Indeed, even though these two sentences describe the same objective situation with identical words, they are semantically distinguishable from each other. Here, the main difference is that the first sentence begins regarding the most extensive area and ends with reference to the smallest one, and the second one begins with reference to the smallest area and ends with reference to the largest one. The words of constructions occur in a temporal sequence, which linguists refer to as a *linear order.* Since these words appear sequentially, an order always incorporates an effect on meaning itself (Langacker, 2008: 79-85).

At the conceptual level, sequencing is not continually driven by the order of words in a speech. For instance: *the hill gently rises from the bank of the river. The hill gently falls to the bank of the river*. In fact, the point of difference is in the direction of mental scanning (Langacker, 2008: 82-83). The concept of upward mental scanning occurs with *rises from* in the first sentence, whereas downward scanning occurs with *falls to* in the second sentence. Although the senses of *rising* and *falling* typically refer to spatial motion, here, they refer to a static situation.

Thus, mental scanning can support a path that is either continuous or discrete. The sentences mentioned above (with the verbs *rises from* and *falls to)* indicate a continuous path. By contrast, the mental scanning involved in the analysis of these sentences supports a discrete path (sizes or mathematical subjects):

- *I'll never get into a size 8, and a size 9 is probably still too small.*
- *Don't mention that calculus-elementary algebra is already too advanced for him.*

These are two paths within a general process that refer to summary scanning. The elements perceived at each stage are added, and the conception is continuously built up and accessible for a specific processing time.

Considering scanning as a point of reference, the attention focuses on a salient or relevant entity to find another entity. The particular reason for scanning along this path is to identify the last element arrived at. For instance, *do you see that boat out there in the lake? There's a duck swimming right next to it.* Here, the speaker wants to focus attention on the duck, but the boat is easier to identify due to the distance. Then, once the listener has seen the boat, the duck may be found next to it (Langacker, 2008: 83-84). In this case, the reference point is the boat, the target is the duck, and the dominion includes everything, the duck and the boat's proximity. Once these elements are pointed out, the target provides an entrance to the dominion, and then this target may feed into the reference point to find another target.

As described by Langacker, a chain of reference points is scanned, as in the sample mentioned above of locations: *upstairs, in the bedroom, in the closet, on the shelf*. A particular location is referred to firstly. After that, access to any smaller location is centred, one of which is the reference point and the other is the target itself (Langacker, 2008: 84-85).

The first dimension of imagery is a *profile* on a *base* (Langacker, 1991: 5-12). This profile is a substructure of a level within the base. The base is essential to the semantic value of each construction. The *semantic value* does not stay in either the profile or the base separately, but in a relationship between these two. Thus, the base for the description of a concept such as *hypotenuse* is the representation of a right-angled triangle, or for *tip,* the base is the representation of an elongated object.

The second dimension of imagery is the *specificity* at which a circumstance is interpreted as in these examples: *That player is tall. That defensive player is over 6' tall.*

The third dimension of imagery proposes the *scale* and *scope of predication*. Consider the notion *island* in its various ranges, the water, the body of water surrounding an island, the finger of land extending into the water as a *peninsula* provides scope. Also, the notion of *bay* designates land and water on a larger scale. Other examples with body parts are illustrated in the semantic and structural meaning. The position is essential in some terms like *head, arm,* and *leg* relative to the body as a whole, whose representation acts as the domain and scope of predication. Each designates this scope of predication for other body parts on a smaller scale (*hand, elbow or forearm on an arm*).

The fourth dimension of imagery presents the relative salience of a predication's substructures. The word salience is a general notion, but it depends on factors such as a projection with profiling, the relation between participants, and the relevance of elements. Thus, relational predications usually demonstrate evidence of an asymmetry in the relation of participants. However, this asymmetry is noticeable in cases with the verbs *go, hit* or *enter,* where a participant changes a position in relation to another participant.

The fifth dimension of imagery is the construal of a situation related to different expectations and suppositions. For instance, here the main distinction between *few* and *a few* is that the former is somehow negative (*few*), and the latter more positive (*a few*). Therefore, these correspondent predications indicate a variance from an implicit reference point in a negative or a positive inclination.

-*He has a few friends in high places.*

-*He has few friends in high places.*

-*Few people have any friends in high places.*

Finally, the last dimension of imagery is perspective (Langacker, 1991: 10-12), which includes other specific factors, such as orientation, a vantage point, directionality, and how an entity is interpreted objectively. For instance, the first sentence below shows orientation and a vantage point. The second and the third sentences below show the direction without any motion. In the third sentence, the sense of movement is abstract, and the mover is an agent construed *subjectively*. The examples of movement are (Langacker, 1991: 10-12):

-*Brian is sitting to the left of Sally.*

-*The hill falls gently to the bank of the river.*

-*The hill rises gently from the bank of the river.*

Therefore, the term perspective includes orientation and vantage point factors in a particular viewing arrangement. The orientation is evident in the samples of *right* or *left*, whose use is indicated by the direction of the speaker and listener. The indication of vantage point is visible from deictic words (*here* or *there*). The degree of *subjectivity* or *objectivity* is visible when the speaker presents a precise entity and situation.

Considering a simple perceptual sample such as the glasses I usually wear. If I take the glasses off, experiment in front of me or hold them, the construal situation is objective because the glasses act as the object of perception. By contrast, the construal of my glasses is subjective, at the moment when I am wearing them, and inspecting another object because then the glasses act as a subject of perception. Thus, the distinction between subjective and objective construal indicates the asymmetry between an entity construed subjectively being seen as implicit, whereas the entity construed objectively is salient, and the focus of attention is explicit.

4.2 The frame of reference between a trajector and a landmark

In this section, the main points of frames of reference are considered for the purpose of our corpus-based analysis of prepositions.

According to Levinson (2004: 34-37), the principal frames of reference are *intrinsic*, *absolute* and *relative* (see section *2.6*). In short, there are some specific differences between these spatial frames of reference. *Relative* occurs in spatial relations between objects from a subjective point of view. Also, inside the *relative* frame, deictic is included, which depends on the LM and the speaker's viewpoint. *Absolute* occurs when entities are fixed bearings and also *environment-centred*. *Intrinsic* refers to the visual perception of objects *(object-centred* and *non-speaker centric)* (see figure 8).

When *relative space* is recognised, it refers to an egocentric coordinate system or *body-centred*, and when *absolute space* is recognised, it refers to a non-egocentric one. Another distinction is between *egocentric* and *allocentric*, which refers to the coordinate

system centred within the subjective point of view. The second one is centred elsewhere within another area, namely the geographic orientation that is not often specified (Levinson, 2004: 37-39). Then, these are related to *body-centred* and *environment-centred* frames of reference. As Campbell (1993: 65-95) argues, the egocentric frame is connected with *body-centred*, a *speaker* and a *body-schema* in a spatial interaction (quoted in Levinson, 2004: 29).

Another feature is based on the theory of vision, whereby frames are *viewer-centred* and *object-centred*. As Levinson (2004: 43-46) notes, the process of the vision from an image to the recognition of an object itself, from 2.5 D sketch to a model of 3D as a structural description. This distinction is related to the linguistic terms of *deictic* and *intrinsic* perspectives. Thence, the *deictic* perspective would be *viewer-centred*, while the *intrinsic* perspective would be *object-centred*.

Moreover, Vandeloise's spatial relations are observed in depth. These relations are associated with frames of reference to interpret interaction in spatial relations and the analysis of prepositions.

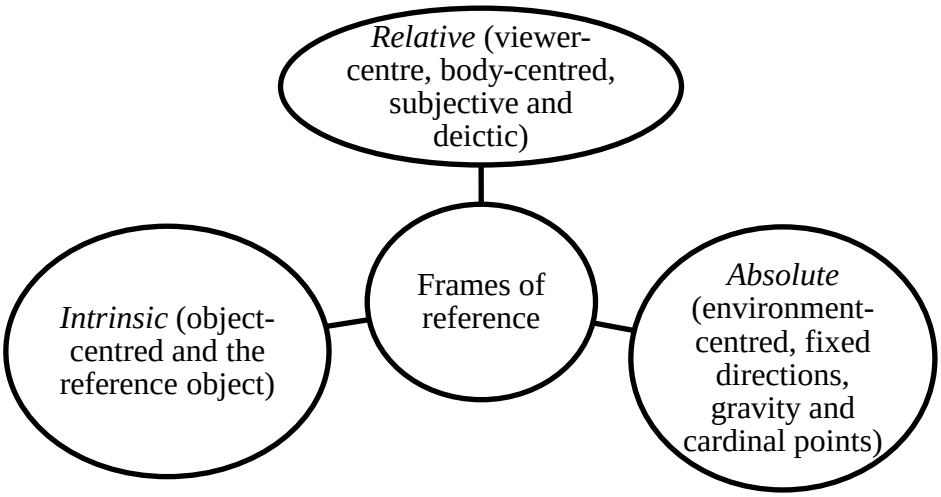
The linguistic principle may go as follows: the *subject of a spatial relation* means the *target*, and the *object of a spatial relation* means the *landmark (see section 2.7).* In short, the primary spatial relations are the following ones (Vandeloise, 1991: 68-70):

- Dimension of landmark
- Speed of the target (subject)
- Speed of the landmark (object)
- Size of the speaker
- Speed of the speaker
- Size and speed of the addressee
- The facility of access and types of access

Regarding access to the meeting point between the LM and the target within a scene, some factors make this access easier or more difficult depending on the following elements listed below:

- The relative speed of target and landmark
- Distance
- Type of access

Figure 8. Frames of reference.



4.3 Topology

In this section, topology is initially described according to four dictionaries and then discussed in light of different approaches. The term topology is defined as follows:

Macmillan Online Dictionary: *the mathematical study of the features that objects still have when they are twisted and stretched out of shape but not torn*.

Merriam-Webster Online Dictionary:

1) Topographic study of a particular place. Specifically: the history of a region as indicated by its topography.

2) a) A branch of mathematics concerned with those properties of geometric configurations (such as point sets) which are unaltered by elastic deformations (such as stretching or a twisting) that are homeomorphisms. b) The set of all open subsets of a topological space.

Cambridge Online Dictionary: *specialised mathematics- the way the parts of something are organised or connected.*

English Oxford Online Dictionary:

1. Mathematics- the study of geometrical properties and spatial relations unaffected by the continuous change of shape or size of figures. 1.1 a family of open subsets of an abstract space such that the union and the intersection of any two of them are members of a family, and which includes the space itself and the empty set.

2. The way in which constituent parts are interrelated or arranged.

Some relevant authors commented on the notion of topology (Talmy, 2000: 27-31; Herskovits, 1980: 2-6; 1986). Topology regards the stage of a physical world in which the physical features in spatial schemas are away from an abstract language approach. A schema comes with geometrical delineations within a physical object. Physical forms are represented by lines, points or planes. The forms are physical when seen and less physical (abstract) when imagined with emotions or feelings. In contrast, an abstract approach removes shapes, curves, magnitudes, angles, or distances between them.

Thus, this abstraction is established in the mathematical field of topology. These relations are metric spaces (classical Euclidean geometry) that observe details of shape, size, angle or distance. In languages, distinctions of this sort are designated by lexical elements (*square, straight, equal, and numerals*). Language presents a noted link with topology at the structural level of conceptual organisation.

As one semantic dimension, topology is approached in semantics so that "The visual perception of objects gives the speaker clues for establishing and conceptualising topological relations like coincidence, contact, inclusion, proximity, and the like" (Navarro i Ferrando, 1998: 171).

Considering a form of representation (Chatterjee, 2001), the system of symbols concerns language, which needs to refer to spatial information (spatial perspectives, the geometry of spatial relationships, the division of figure from ground, and the dynamics of force). Thus, spatial representations convey geometric information.

The principal distinction between spatial representations and language is that these representations can be geometric, perceptual, or sensory in the case of spatial representations. In contrast, language can be conceptual, algebraic, or amodal (Chatterjee, 2001). Similarly, both of them can be concrete or abstract. The primary geometric forms such as lines, points and planes are the notion schemas. These schemas share the properties connected with perceptual representations and language but convert spatial features in basic qualitative ways rather than specific images and metrics.

Moreover, the topological extension is commented on by Tyler & Evans (2003: 58; 70-72; 123-131). Spatial relations and conceptualised space are not established as being at a fixed distance or in a fixed size, contour or at a fixed angle. These relations are topological in nature, involving relativistic relationships rather than absolute *fixed quantities* (Talmy, 2000: 170). Hence, a configuration of TR and LM can be formed conceptually, providing that the relation indicated by the proto-scene remains constant.

From a casual perspective, this conceptual space spreads over in a stretchy way. This is analogous to the surface of a balloon, which can be deflated and inflated. For example, drawing a face on a balloon means that all its parts, the eyes, nose and mouth, have created connections to each other (Tyler & Evans, 2003). After that, when this balloon is inflated, the accurate distance between these elements changes. Thus, the possibility

of altering the distance presents itself in various ways by compressing air into one part or other of the balloon. Nevertheless, the relation between these elements remains.

Hence, in topological extension, the human conceptual system for spatial areas does not judge the metric distances but rather the flexible judgements in relation to representation, which are nonetheless systematic.

Recognising the assumption that semantic representation induces a conceptually reasoned representation of the scene, many uses of spatial particles have previously been labelled as arbitrary. When language indicates the real world, then the objectively metric traits and principles of Euclidean geometry come into view to hold the space and physical area, which forms the grounds of linguistic descriptions.

The traditional form of representing information has been using semantic features (Brugman & Lakoff, 1988: 2-4). These features are limited, significant by the connection to things but without inherent meaning. Moreover, cognitive topology is also necessary to represent information because of the characterisation of structures connected to the human body in spatial relations. These spatial relations are paths, defined regions, tops, among others. These structures of cognitive topology are different from semantic features: inherent as natural ability, analogue (comparable or with similarity) and not limited, since the relations occur in a natural procedure through the human sensory-motor system.

Hence, this provides a basis for a topology representation (Brugman & Lakoff, 1988: 2-5): topological characteristics of concepts are necessary to designate the image-schemas representations about the natural procedures in cognitive topology, instead of using an arbitrary analysis. These topological concepts are applied to understand how a preposition is used for a boundless space in visual scenes.

4.4 Force dynamics

Talmy proposes a semantic category in the linguistic discipline named force dynamics (2000: 9-14; 428-430). In this category, entities interact regarding force, the effort of force, the resistance, the overcoming of this resistance, the resistance to the force, or the act of moving such resistance.

Firstly, this category is a generalisation over the notion of *causative* since it analyses *causing* within a framework that also involves *letting*, *slow progress* or *collaborating*. Lexical items refer to physical force interaction. This linguistic system presents a similarity to this conception for force interaction in early physics, in the early science and treatments of modern science.

Concerning the organisation of linguistic meaning, the application of force concepts remained disregarded until an initial attempt in Talmy (1983: 229-240). Force dynamics is a relevant parameter to analyse the prepositions in this study. Talmy proposes the

fundamental force-dynamics distinctions for their application to the linguistic expression of physical force (Talmy, 2000: 413-428):

1. Steady-State Force-Dynamic Patterns: the role distinction between two entities is the resistance of two forces. A steady-state refers to a condition that does not change and is regular in a movement. The first force is the focal attention to know whether the entity can prove its force tendency or overcome it. The focal force entity is named the Agonist, and the other force that confronts it is the Antagonist.

2. Shifting Force-Dynamic Patterns: a type of changing pattern is a shift in the state of impingement, and here the Antagonist enters or departs this state of impingement. For instance (Talmy, 2000: 422): *the ball's hitting it made the lamp topple from the table.* In this example, an Antagonist enters into a position against an Agonist that will remain in position until influenced by the Antagonist changing its dynamic and causing a change from a state of rest to one of action.

3. Secondary Steady-State Force-Dynamics Patterns: an Antagonist opposes an Agonist. Two entities are in opposition of force and allow for *extended letting*. For instance, *the plug's staying loose let the water drain from the tank.* In this example, there is prolonged facilitating of motion (the loose plug allows the water to flow, thus facilitating the motion of the water).

4. The relation of Agency to the Force-Dynamic Patterns: an agent that plans the occasion of a physical event, as in *I broke the vase*. This is a voluntary act by the agent to move specific body parts. Another element can be included in this sentence that leads to the final event, as in *I broke the vase by hitting it with a ball*.

5. Alternatives of Foregrounding in Force-Dynamics Patterns: the Agonist can be in the foreground, and the Antagonist is in the background either by exclusion or disposition. For instance, *the ball kept rolling.* Alternatively, the Antagonist can be in the foreground as the subject, and the Agonist is in the background as the direct object. For instance, *the wind kept the ball rolling.*

6. Force-Dynamic patterns with a weaker Antagonist: all the force dynamic patterns occur with a stronger Antagonist. Nevertheless, this framework allows patterns with a weaker Antagonist. Some examples are in patterns, such as *the shed kept standing despite the gale blowing against it.* Here the Antagonist is invading against the Agonist. In this case, for the *despite* or *although* formulations, the Agonist plays as a subject.

7. Particularised Factors in Force-Dynamic Patterns: factors refer to any element or event representing the pattern. This identity includes an essential notion, where this factor is specified, such as *be* or *move* and includes some lexical items. For example, *the log stayed on the incline because of the ridge there.*

Thus, these factors are essentially the ones in accord with a concrete conceptual prototype for force interaction (Talmy, 2000: 467): “A stronger force opposing a weaker force head-on, with all-or-none conditions”.

4.5 Image schemas in language structure

The relation between perception and meaning focuses on the interactions of the body when experiencing the world (Johnson, 1987, 1989: 66-57; 216-220). In the objectivist view of meaning, objects hold limited properties and have relations. In the objectivist paradigm, the abstract relation between representations and objective reality is the meaning itself. Also, literal concepts can be seen as containing meaning with settings of objects, relations and properties. This meaning is objective and in relation to the world, not dependent on any person or community. Then, the theory of meaning and understanding are not the same. The reasoning is seen as a process that occurs in a person's mind and has a connection with symbols from which the meaning is drawn by relation with the objective relation.

Moreover, the theory of meaning is related to understanding since understanding is the way of experiencing the world, comprehending it and communicating the sense of existence. This understanding is an imaginative task, the ability to make sense of objects and explain arguments. From this assumption, Johnson and Lakoff examine the term *image schemas,* which are the imaginative procedures connected with meaning and perception.

Visual reality maps onto understanding and knowledge related to the centre-periphery image schema (Johnson, 1987: 165-168). The centre of perception tends to be more important than the periphery. An image schema of topology is a developing pattern of our imaginative experience and organised with an orientation of centre-periphery. In understanding and reasoning aspects, most abstract concepts are based on bodily experience.

Some fundamental questions focus on a reflection about their usage: What features are shared by most image schemas? How can image schemas be grouped? How might a representation of graphics influence a linguistic analysis?

In comparison with a scene or a script, the term “schema” means: “a cognitive representation comprising a generalisation over perceived similarities among instances of usage” (Kemmer & Barlow 2000: xviii).

The term “image” means an equal representation of interactions, activities or objects. A representation involves a perception based on visual, motor, olfactory or auditory experiences with topological or dynamic features (Oakley, 2007).

Oakley (2007: 214) points out, “[...] a schema has been historically defined as a fixed template for ordering specific information, whereas an image has been defined as a representation of specific patterns capable of being rendered schematically”.

For Cienki (1997), some graphic representations suggest a more primary perception (a path) than others in which there is a complex representation (dynamic states). Mandler (1992) argues that some schemas are more fundamental than others. The more basic schemas development is essential to distinguish a trajectory and form groups.

Santibáñez (2002), following other proposals (Cienki, 1997; Peña, 2000), points out that not all these image schemas should be classified on the same level. Underlying the basic level for the image schema of an object, for example, there is a connection with other dependent schemas. The basic level develops an interaction with entities so that the complementary schemas are link, part whole and centre-periphery schemas that focus on various aspects of an object schema.

According to Johnson (1989: 115-116), the relational items connected with the orientation of centre-periphery are:

- *Centre, periphery, figure, ground, self, other, here, there, near, far, toward, away from, important or unimportant*.

- Container schema: *inner, outer, mine, not mine, core or periphery.*

In addition, there are two categories of image schemas related to concrete and literal senses:

a) Biologically-based, image schemas connected with the experience in a changing environment.

b) Imaginative structures (metaphors, radial categories or metonymies).

A linguistic meaning is the significance of a word, which expresses a description of an experience, an interaction, goals or aims.

Thus, a distinction between mental pictures and image schemata is that the latter play a part in determining general knowledge in a way that the previous do not. Schemata are more abstract and flexible than mental pictures. In general, to show how precise metaphorical projections need meaningful connections and suggested patterns, the process is to explore the organisation of the image schemata upon which these meanings are based and determine why the specific mappings of source domains onto target domains happen.

The types of image schema are relevant for determining the spatial relationship expressed by prepositions. In connection with this study, the analysis of prepositions presents a proposal with image schemas. Image schemas and their subgroups by Johnson (1987) are detailed below**:**

- Topology:
- Containment; centre-periphery (near-far); scale: height or distance/ qualitative (degree of intensity) and quantitative (increase or decrease).

- Spatial motion:
- Path (source-path-goal/from-to); cycle: complex cycles (breathing, walking-standing, wakening-falling asleep), cyclic processes (seasons, day and night, the

stages of progress in animals or plants, the life cycle from birth to death), or cyclic climax *(rise* and *fall).*

- Force group:
- Compulsion (obligation, force, pressure); blockage; counterforce (face-to-face); diversion (*against the wind*); removal of restrain (control, there is nothing blocking; e.g., *a door is opened*); enablement (there is an access in order to do an activity; e.g., *pick up*); attraction (*vacuum, magnet*); link (*family, snaps of coat*); and balance (axis, point, twin-pan and equilibrium).

Image schemas and their subgroups by Lakoff (1987) are detailed below:

- Transformations:
- path to end focus; multiplex to mass (*cattle* and *cows*, a single mass and groups); following a trajectory; superimposition (the size increases and decreases); reflexive (part of entity is TR and other part is LM, use of prepositions *out/over*; e.g., *the syrup spread out*; *roll the log over*); and rotation (blocks access of vision, continuous vision).

- Spatial group:
- covering; above; across; contact; vertical orientation (*up-down*); length (extended TR, use of prepositions *over/up*); linear order.

Johnson (1987: 58-64; 165-167) proposes the following Image schemas:

Topology group:

1. Containment: this means to experience our physical containment, to encounter containment and being bounded, in the three-dimensional containers into which things are put (water, food, air), when people move in and out of rooms, vehicles, clothes or other bounded spaces, manipulate objects, placing in containers (bags, boxes or cups). In the case of one, two, or three dimensions, physical *in-out* orientation implies differentiation, separation and enclosure, indicating limitation and restriction.

2. Centre-periphery: from the vantage point (viewpoint), the attention is focused on one object after another object or on the perceptual field, and then, the world is scanned. An object can be seen in the foreground at a moment or in the background at another moment. At a certain distance, an object can be seen from the perceptual centre which fades off into the perceptual horizon. Thus, this schema represents the centre point, the perceptual and experiential centre (experiential space), and a wavy line that is the horizon on the periphery of vision. In this schema, some events, persons, or things are more relevant and central to the interactions, whereas others are appreciably peripheral

at a given point in time. For instance, metaphorically, as an abstract interpretation, a friend is more central to one's interaction with society than anyone else.

Therefore, the key points are the limits of perception, the nature of the body, and our awareness to focus on the centre-periphery of the experienced reality. This image schema is experienced with others superimposed to determine orientation. Some other image schemas superimposed are the following:

- Having a centre and a periphery, the near-far schema is experienced through our conceptual or perceptual experience. The things considered near depend upon the context, but when this schema of near-far is established, a scale is classified for deciding relative nearness to the centre point.

- In most cases, there is a container schema superimposed on the orientation of the centre-periphery. Considering our interests, purposes, capacities, or values (defining physical and mental identities, *body* and *mind*), people draw the contents with marked boundaries in a setting.

- After a container schema is superimposed, then a central point (*inner*) or the determination of an *outer* object relative to it is experienced by the viewer. This perception is likely to occur for the inner-outer orientation in the perceptual field and particular abstract objects (geometrical figures or models).

- This *inner-outer* pattern provides the force of a subject-object orientation through our subjectivity, which refers to an innermost or a central point of our perceived object.

- Thus, this *innermost* or deep dimension supplies to a *self-other* distinction which can appear the *mine-thine* (mine and yours) valuation applied upon it. These meaning structures are central to our experience and understanding, and the superimposition of schematic structures are also in metaphorical concepts understood at many diverse levels.

3. Scale: Here, considering the metaphor *more is up* clarifies many linguistic expressions that involve amount. For example, *the crime rate keeps rising*. *That stock has fallen again. Our sales dropped last year*. This image schema refers to the qualitative and quantitative aspects of experience. On the subject of quantitative aspects, objects can be organised in various ways, increasing or decreasing. Whereas in qualitative aspects, objects or events can be in varying intensity, such as one potato being *hotter than another*. *One blue is more profound than another*. *One light is brighter than another.*

Thus, the world is experienced through the terms *more, less* or *the same.* For example, the number of objects, the *amount* of material, the *degree* of physical power or the *intensity* of feeling. These are the aspects with which humans experiment and form part

of this schema's basis. A common feature is assigned by both the *scale* and *path* schemas. These can be either opened or closed schemas. They can continue in one orientation having no specified limit or at a fixed position. These image schemas of topology are significant for determining, for example, a distance, a height or proximity in interpreting an analysis of prepositions.

The spatial motion group (Johnson, 1987: 65; 160-161):

1. Path: the path schema consists of "parts" and "relations". This image schema needs three components (1. a source point A - a starting point; 2. a terminal point B - a goal; and 3. a direction tracing a path between these two points - a sequence of locations connecting the source with the goal), and a relation (pointed out as a force vector moving from A to B). This from-to schema manifests in several types of events, such as walking from one place to another, throwing a baseball to someone, hitting someone, or even giving one's mother a gift.

2. Cycle: this image schema occurs along with complex interacting cycles (breathing, walking-standing, wakening-falling asleep), some cyclic processes (seasons, day and night, the stages of progress in animals or plants, and the life cycle itself from birth to death). The primary meaning is that it begins at an initial point, advances through connected situations and ends at the same place where the cycle begins a new cyclic pattern. This representation includes a climactic structure with a sine wave (*rise* and *fall*), called the cyclic climax.

Thus, a cycle produces a spherical motion and has some features (from Eviatar, 1985, in Johnson, 1987: 161):

- A cycle consists of temporal boundaries in ordinary activities (shorten a week just to five days).

- A cycle may be sequential, multiple or overlapping (temporal for -hours or days- or functional for -cycles for doctors).

- A cycle can be regarded in a quantitative model (time) or a certain qualitative point (day, night, a weekend or a week).

- A cycle can be *natural* or *conventional,* i.e. have a traditional and cultural aspect.

Thus, it results that, both in a circular form and in the sine wave representation of a climactic structure, the cycle schema forms a basic pattern for the aim of experiencing and understanding temporal sequences and events or even non-temporal entities (numbers).

The image schemas of force are significant for determining the relations between a TR and an LM in the analysis of prepositions. For example, there is an opposition of two forces, pressure, control, and access to do an activity or blockage. The most common image schemas that represent force patterns are the following (Johnson, 1987: 84-87; 127-135; 158):

1. Compulsion: this image schema means force, obligation or pressure. This situation occurs as external forces, such as when wind, physical objects, water, or people move other entities. Compulsion sometimes refers to a force that overcomes resistance. Otherwise, it refers to a resisted force. This force has a direction and moves along a path.

2. Blockage: in the attempt to interact with objects or persons forcefully, this pattern occurs when an object encounters another object that blocks and resists the force. For instance, in the movement of a baby who learns how to crawl, as that baby finds a wall, it blocks the process of her journey. A force vector that encounters an obstacle represents this image schema.

3. Counterforce: here two equally strong forces encounter each other face-to-face on the path. For instance, these forces are familiar in the football linemen, in the head-on meeting of forces.

4. Diversion: this schema shows how two forces smash or collide with a resultant change in force vectors. For example, when someone is rowing a boat at an oblique angle against the wind, the initial force will be lost.

5. Removal of restraint: here, nothing blocks the passage. For example, when a door opens, the entrance is open to allow entry into the room. This image schema suggests the removal of a barrier or its mere absence.

6. Enablement: this image schema focuses on the movements or manipulation of objects when motion brings about a sense of power or lack of power. For example, picking up an object, the groceries, but not lifting the front of a car. Here the usual gestures for force are included in this structure of possibility, including a potential path of motion. Accordingly, this image schema is represented by a potential force vector or the absence of an obstacle.

7. Attraction: an object moves along a path under the influence of an attracting force. For example, in the case of a magnet that draws metal toward itself, when a vacuum cleaner draws dirt into itself, or the earth's gravitational pull draws someone back down as she jumps. This force is a kind of gravitation towards an object, and sometimes there may be additional objects incorporated in the relation of attraction.

8. Link: this image schema occurs when the linked objects are in contact. These objects connect by concrete or abstract linkages with the combination of perceptual capacities or the situation of the perceived environment. Thus, a link appears in common physical cases, such as when the plug fits into the wall socket as an electrical fitting, the buttons of the coat snap together, or a child holds the parent's hand. In the structure of the link schema, there are two elements, A and B, linked by a bounding area.

Thus, linkages may be not only physical, spatial bindings or attachments, but also *temporal connections* (a temporal sequence), *causal connections* (a network is seen as a set of links to comprehend a place), *genetic connections* (a connection via the link of a common source), or *functional linking* (an object may have a relation with a functional unity).

9. In the balance group (Johnson, 1987: 125-131), there are image schemas of axis balance, point balance, twin-pan balance or equilibrium. A prototypical balance schema consists of force vectors, which represent weight, an axis or point about the distribution of forces. This balance includes a symmetrical or proportional organisation of forces close to a point and axis. In all expanded senses of balance based on this original schema, both the axis and force vectors maintain a metaphorical extension:

1. Axis balance: force vectors and an axis represent this image schema.

2. Point balance: the symmetrical force vectors decrease to two symmetrical vectors since the equivalent weights from the balancing force vectors are in balance at a point. Equivalent weights occur when the forces are the same on each side of the supporting point.

3. Twin-pan balance: the axis decreases to an essential point that functions as a support. For instance, in the balance of a rational argument, the winner of an argument feels the *balance tip* in her favour. In the *legal balance*, the judge must estimate the *weights* of damages and award compensation proportional to the damages in a civil case, or at least "let the punishment fit the crime" in a criminal case. In *mathematical equality*, whatever is included on one side, the same must be included on the other side to maintain equality.

4. Equilibrium: the symmetrical force vectors encounter each other at a point onto a curved surface or a sphere (container-surface). Here there is a balance between the *internal* and *external* forces, which relates to a three-dimensional container. In the *systematic balance*, for example, the circulatory or respiratory system of our body must be in a dynamic equilibrium and have a balance of forces for the purpose of functioning correctly. In the *psychological balance*, within an emotional experience, for instance, people usually seek an emotional balance, and the emotions must be *under control*.

The image schemas of transformational aspects are significant for determining the relations of movement between a TR and an LM in the analysis of prepositions. Transformational aspects of image schemas introduced by Lakoff (1987: 416-460) may focus attention on specific aspects of a scene for the elaboration of a concept:

a) Path-focus to end-point-focus: in imagination, this operation implies coming after the moving object in a path and then focusing on the point where this object comes to a stop or where it will proceed to rest.

b) Multiplex to mass: when we look at a group of various objects or individuals, the fact of moving away from the group makes it become a single and alike mass where the identity of individuals fades away. Therefore the image created by perception provides just a mass. Thence, we may move back to the position where the mass (cattle) turns again into a collective or multiplex entity (cows).

c) Following a trajectory: a moving object is perceived continuously; then, mentally, we can indicate the path it follows or the trajectory it is about to follow.

d) Superimposition: there is a large sphere and a small cube in a scene, the size of the cube increases until the sphere fits inside it. Then, the size of the cube decreases and fits within the sphere.

e) Reflexive: this operation can be easily described using the preposition *out.* For instance, *Harry ran out of the room.* In this situation, the TR moves from the interior of the room to the exterior. *The syrup spread out*. When someone accidentally spills the syrup on the table, its boundary moves, that is the jar in which the syrup was contained, since part of that motion was inside the jar, and after that motion, part of the syrup is outside the previous boundary that is the jar. That connection between the TR and the LM is called *reflexive*. This term *reflexive TR* refers to an entity. In some cases, also, a part of a unique entity appears as a TR, and another part of that entity appears as an LM. For instance, *roll the log over*. Here the path indicates the object moving above the grass and across the grass, called the *reflexive path*. The reflexive TR appears in this sentence *roll the log over,* since half of the log appears as a TR and the other half appears as an LM when it rolls over the grass.

f) Rotation: in this transformation, the TR blocks access of vision to at least a part of the LM. There is a continuous motion and in some cases, a lack of orientation. For instance, *there were flies all over the ceiling. As the rain came down, it froze, and ice spread all over the windshield.*

In the spatial group, Lakoff describes further aspects of schemas (Lakoff, 1987: 104; 276; 419-428):

a) Covering: there are quantifiers mixed with *over,* such as *all* to describe the covering schema. These quantifiers occur with masses (most wine that can be seen as mass when referring to amounts within containers. Otherwise, it is seen as volume or quantity) and multiplex entities (mostly ducks). At that point, imagine individual cows in a field where the perception occurs as multiplex entities. After moving a distance away from this field, the perception is a mass. This movement indicates the perceiver is still within the vision of the field but further away than initially. For instance, *I walked all over the hill*. Here, the path covers the LM through a collection of points when the TR is moving along that path.

b) Above: this schema has no specific path and no boundaries. Here, the contact sense does not occur between a TR and an LM, as in some examples such as *the helicopter is hovering over the hill.* Here the helicopter is moving above the LM. When the helicopter lands, it is not over the hill; at that moment, it is on the hill.

c) Across: This aspect specifies the *above/across* sense. The preposition *over* matches both meanings *above* and *across*. An example of it is *the plane flew over*. Here the plane is the TR. At this point, the LM is omitted. However, the path is *above* the LM, and also *across* the boundary from one point to the opposite, and there is no contact between the TR and the LM.

d) Contact: This schema refers to a situation where a TR and an LM touch. For instance, *Sam walked over the hill.* A hill is extended and vertical, and the action of walking requires contact with the ground.

e) Vertical orientation: a metaphor consists of a source domain, a target domain, and a source-to-target mapping. When a metaphor is *natural*, the structure of our experience guides its development. The phrases *more is up,* and *less is down* describe this vertical orientation. For instance, *the number of books published each year keeps going up. That stock has fallen again.* The source domain is verticality, and the target domain is quantity. Here the domain of verticality correlates with the *up-down* schema, which functions in association with gravity.

f) Length (extended TR): For instance, *the bird flew over the yard. The telephone line stretched over the yard.* In the latter example, *over* describes the extension of a long, thin TR such as the telephone line. Let us look at another example, like *the rocket shot up,* in contrast with *the lamp was standing up*. Here, in the first case, *up* is used to indicate the motion path of a TR, and in the second case, *up* is used for the extension of a long, thin object such as the lamp. These structures suggest that an *image schema transformation* exists, considering a motion schema where a TR moves and a long, thin object schema that is extended. These schemas establish a basis for category extension.

g) Linear order: this schema refers to a TR, an LM and other entities involved along a line and an order such as a queue. The schema of a linear order may be classified within the parameters of topology and dynamics.

The Glossary of Cognitive Linguistics offers a list of image schemas as in table 17 (Evans, 2007: 108):

Table 17. The list of image schemas (Evans, 2007: 108):

SPACE	Up-down, front-back, left-right, near-far, centre-periphery, contact, straight, verticality.
CONTAINMENT	Container, in-out, surface, full-empty, content.
LOCOMOTION	Momentum, source-path-goal.
BALANCE	Axis balance, twin-pan balance, point balance, equilibrium.
FORCE	Compulsion, blockage, counterforce, diversion, removal of restraint, enablement, attraction, resistance.
UNITY/ITERATION, MULTIPLICITY	Merging, collection, splitting.
IDENTITY	Part-whole, count-mass, link (age), matching, superimposition.
EXISTENCE	Removal, bounded space, cycle, object, process.

Gallese & Lakoff (2005: 12-13) identify that an image schema is constituted by a network with the following parameters:

1. One group with a parameter.
2. One group for each *parameter value* or variety of values.

3. One *controller* group, when the controller is in an active state, other parameters and the adjunct values are also in that active state.

Image schemas appear in an interaction, starting from our body, our brains and even our social interaction in the physical world. These schemas, then, do not have an interior part and neither are they an exterior reality.

Therefore, from these schemas, some parameters may be identified: including an agent and object (size, shape, and fragility), an initial condition (location), a starting phase (direction), a central phase (with force extending to the end phase), purpose (condition and values) and the final phase (e.g., the agent commands an object).

In descriptions by Boers (1996: 7) and Lakoff (1987: 445), the image schemas are described as concrete forms of perception in a sensing movement (natural kinaesthetic). These image schemas are not immovable pictures but are constructions of an activity involved with our bodily experience.

In the list of image schemas, Johnson (1987: 126) includes other types mentioned by Boers (1996: 7): *matching, iteration, process, surface, object or collection.* The variety of image schemas is not limited, but also some subtypes may be included, such as in the schema of *force* (compulsion, blockage, and counterforce).

4.6 Horizontal orientation and asymmetry

In a scene, there is a primary object and sometimes a secondary object. Talmy (2000: 183-185; 203-205) suggests that the spatial and temporal qualities assigned to the primary object are uncertain. It is not fixed but capable of being moved. It is smaller than the secondary object. In a geometric view, it is easy to point to in its process. It has been on the scene recently. It has salience but is less visible. As soon as it is visible, it is more marked with the characteristic of being dependent.

The characteristics of a secondary object are: it is named the reference entity, and it knows the properties of the primary object. It is located for all times, and it is large and complex in its process. It is more quickly identified than the primary object on the scene. It has little salience, and it is visible instantly. It is situated in the background when the primary object is recognised so that it appears as an independent object.

The terms figure and ground are connected to the distinct objects named the primary object and the secondary object. The figure is an entity that is moving or capable of moving to an orientation in a path. The ground is a fixed reference entity from which the figure or its orientation in a path can be identified. For example, *the bike and the house are near each other.* Here, *the bike* is the figure, and *the house* is the ground. Therefore, in the characterisation of a location by more than one object, the basis for the identification of the primary reference object is that it is the one that has the identical

semantic role as the unique ground object. The second reference object does not appear explicitly in a scene, but a concrete spatial term may indicate it.

For instance, *John is ahead of Mary (in the line).* Here, the queue is the ground from end to the front, and it can also serve as the secondary reference object, which contains a primary reference object inside this scene. It is necessary to locate the primary object that is *Mary*, also the figure that is *John* in this case, including the direction of the secondary object that is a queue, namely, the ground from end to front.

For instance, *in this fish species, the swim bladder is ventral to the spine* (the organ in the body that may hold liquids, and it is situated on the abdominal section). Here, the interior of a body as an organism could be ground and the secondary object. Then, the figure is *the swim bladder*, the primary object is *the spine*, and the reference of a secondary object is *ventral to*. Some other examples are (Talmy, 2000: 196-201):

- *The mosaic is on the east wall of the church*. (The physical contact is with a part of the primary object, which is the church).

- *The bike is on the east side of the church*. (The location is adjacent to the primary object itself, which is the church).

- *The bike is eastward of the church*. (At an uncertain location from the primary reference, which is the church).

Moreover, the expression *on the east side of* refers to the identification of a secondary object since in this position of *the east side*, the hearer needs to look outside the principal object itself of *the church* in the earth's orientations (*the bike is on the east side of the church*), whereas the expression *on the left side of* refers to the identification of a primary object as *the church* (*the bike is on the left side of the church*).

On the point of the external secondary reference object, another type of secondary object is included, namely, one object situated at an external point from the primary object, in which case this would be either nearest to it or furthest from it. For example, the speaker can act as an external secondary object. *The bike is on this side of the church*. Here, it is understood that the speaker is the external secondary object because of the expression *on this side of the church,* which is nearer to me. *The bike is on the other side of the church.* Here, it is understood that the speaker is the external secondary object because of the expression *on the other side of the church* that is further from me.

Hence, by way of the external secondary object, another option for identifying the figure is through the Figure-encountering path. Here, the external object can be a guide to indicate the figure along a path from the primary object to the secondary object. The same method is also used to identify the secondary object itself. For instance, *John is ahead of/east of Mary.*

Despite having ground geometries with homologous parts which are identified as the same parts from each other, there is a dominant group of ground objects which are asymmetrical. As far as asymmetric ground geometries are concerned (Talmy, 2000: 196-201), there are three points on which to comment, which are asymmetry of parts, asymmetry in direction and asymmetry of motion. In asymmetry of parts, the structure is basically from dissimilar parts which are separated from each other, and some of them lack direction or goal. Hence, the term asymmetry refers to the forms which are not symmetrical parts. These parts are related to the structure of the object but not in similar ways to each other, and these parts have their distinct characteristics.

According to Talmy (2000: 196-201), there are three ways to identify a figure type:

- The first type is in contact with an asymmetric part. The figure is in contact with the physical part, e.g., *the mosaic is on the front of the church. The boy is in the front of the line.* This type often appears after using *front, back, right* or *left.*

- The second type is adjacency to an asymmetric part, which indicates the object's part and the volume of space so that this part is adjacent and proximate to the figure. This type does not appear after *the* when using the words *front* or *back*, e.g., *the bike is in front of the church. The bike is at the back of the church. The police officer is in front of the line.*

- The third type is at some distance from an asymmetric part, which is similar to the second type, although the difference is that the adjacency characteristic is eliminated. Thus, the figure is situated in a specific space by a reference to an object at some distance. This type appears with the expressions *to the right of* or *to the left of* so that these examples are without adjacency: *the bike is to the right of the church. The bike is a way off from the front of the church.*

Moreover, asymmetry in direction (see figure 9) is another form of asymmetry related to a straight route such as motion along a figure's path in a direction or opposite direction. In these cases, the direction of a figure along a path can be identified by two asymmetric forms, one of them refers to a part, and the other one refers to a direction.

An example is when people are in a queue, using the forms *ahead* or *forward* (moving in a direction), *backward* or *back down* (the opposite direction), and *toward the front* or *toward the rear* (asymmetry of parts). Some examples are: *They passed his $20 bill ahead or forward along the line, and passed his ticket back down the line.* Another example is from the interior of a body using the term *toward ventral or dorsal side (In an affected fish, the parasites hatch along the spine and move through the tissue toward the ventral/dorsal edge of the fish).* A further example is in the degree of a slope, such as increasing or decreasing the amount of gradient (Talmy, 2000: 196-201). The terms used are *along* or *against (The growing axon moves along/against the interstitial chemical gradient to encounter its target).*

Another form of asymmetry is asymmetry of motion. In that case, the ground is moving, and the figure is located on this ground. The terms used are *with* for heading the same direction or *against* for heading the opposite direction. A sense of force dynamics is included in this context of the figure and the ground. E.g., *Jane swam with/ against the current. Jane sailed with/ against the wind.* Other forms are used, such as *upstream* or *downstream,* in expressions like *Jane swan upstream. Jane drove her car downstream. Jane ran downstream.*

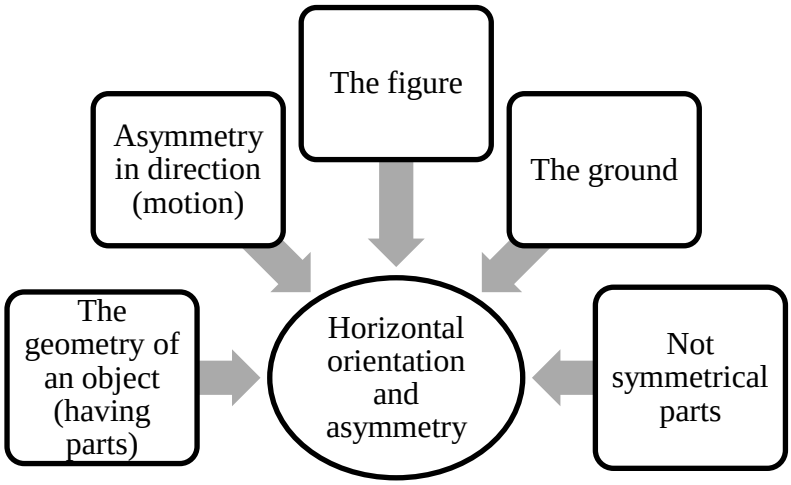
Furthermore, by means of the Earth as a ground with an asymmetric geometry, the ground object of the Earth is indicated so as to structure space with the human body at the same time. Here the locations of parts or directions in these three usages are north or south, up or down, and east or west. In saying, for instance, *the balloon floated north/ east,* it would be mentioning the motion toward the north or the east. Nevertheless, the common usage of these geometric terms tends to be the sense for using terms of direction associated with space. When the expressions relating to space indicate a reference point in such case, *Sue drove north* or *Sue drove toward the north,* both of them would appear involved in direction.

Referring to forms with relatively specific reference, the main parameters in the domain of spatial relations, such as English prepositions or deictic use, may be the following ones (Talmy, 2000: 241-242):

- A division of a spatial relation from a figure to a ground.
- A geometric schema of a figure and a ground. In geometry, the symmetry or the asymmetry of a figure and a ground.
- The asymmetry of an object focused on its parts or on the asymmetry of direction.
- The dimensions of an object in a geometric schema. The boundary formation of an object.
- The geometry of an object is seen as a continuous object or as a composite object, therefore as having parts.
- The orientation of a figure itself to the ground.
- The relative distance or magnitude as a measure of a figure associated with the ground.
- The presence or nonexistence of the contact sense from the figure with respect to the ground in a scene.
- The figure's division of material or physical substance with respect to the ground.
- A presence or nonexistence of having a reference from a figure or a ground.
- The addition or non-addition of other reference objects.
- In the exterior of a scene, the acts of projecting a secondary reference object.
- An attribution of asymmetry for a primary reference object.
- A relative position of the figure and ground focused on the speaker, the earth, or other added secondary object in a scene.

- A mapping of one object onto another, being inserted in a placement from a figure to a ground.
- A perspective from a viewpoint to adopt this arrangement or configuration on a scene.
- A variation of the location of a figure or from the perspective of time, such as paths including motion, among others.

Figure 9. Horizontal orientation and asymmetry.



4.7 The scale of animacy

Animacy is a relevant parameter to determine the relationship between the participants and the use of a preposition in a context. Feist (2000) highlights some points to understand the role of animacy. This author reports some experiments about geometry, function, and animacy of the figure and the ground, considering examples of the prepositions *in* and *on* (Feist, 2000: 125-159). In her study, Feist uses the terms figure and ground, meaning TR and LM. She shows that animacy influences the English speakers in choosing *in* or *on* appropriately. To determine animacy, not only does the speaker look at the scene, but it is inevitable to look at the ground and at the figure. Furthermore, background information about the ground may contribute to deciding the use of one spatial term or another. Thus, the use of spatial terms may involve the animacy of the ground. A ground, which is animated, serves to confirm the control over other objects and the location of the figure. Scenes with an animate ground generate different prepositional uses from scenes with an inanimate ground.

Regarding general conceptual information about the figure (TR), Feist suggests that an intention assigned to a figure can influence a preposition choice. For instance, the preposition *in* means that the ground includes the figure (*Rommel is in Cairo*), whereas

the preposition *at* means that the figure intentionally reaches the final destination (*Rommel is at Cairo*). In Feist's view, the choice of prepositions *in* or *on* is influenced by the animacy of the ground and the figure. Feist (2000: 216-218) presents examples of prepositions regarding their attributes, the value in a scene, the value in lexical entry, and the comparison among these values. In this example, *a pear in a bowl*, comparing the value in a scene and the value in lexical entry, here the scene matches the value of a function, in which the ground is a container to carry out the containment as a *function*. Here, there is also coincidence since the scene matches the value of *qualitative physics*[4], where the ground bounds the movement and the position of the fruit. In addition, in this scene, the value of the animacy of the figure is inanimate and non-self-determining.

Feist (2000: 227-229) reports an experiment where participants completed some sentences with the prepositions *in* or *on* without pictures. The sentences are: *the firefly is in/on the hand. The firefly is in/on the dish. The coin is in/on the hand. The coin is in/on the dish.* Making this choice without pictures means that there is no access to the attributes of *geometry* and *qualitative physics*; despite not having this, speakers located the ground's function, the ground's animacy and the figure's animacy into the information relating to nouns for a ground and a figure (*firefly, hand, dish, coin*). Thus, when the inanimate ground refers to a bowl as a container, the uses of *in* are more frequent, whereas when there is an inanimate ground such as a plate which is a surface, the uses of *in* are fewer. In fact, there is an influence on the animacy of the ground and its concavity as a curve inward like the inside of a sphere. The uses of *in* are higher for the animate ground as a hand than for the inanimate ground. This distinction seems to be due to the control of the ground over the motion of the figure. In such a case, a hand can proceed to close and become more concave. In the representation of spatial relations, Feist orders abstract attributes according to their influence in preposition choice: *Function, geometry, qualitative physics, animacy of the ground* or the capacity of self-determination, *animacy of the figure* or the capacity for self-determination mainly.

Feist (2008: 1195, 2009) notes that the kind of information gathered influences the spatial language, such as the kind of functional, geometric or physical information. The experiments show that the animacy of the figure and the ground, or their opposites, namely, inanimate figures and animate grounds, according to the perception of participants, influences on preposition choice (Feist, 2009).

Thus, as for describing a spatial location, the extra-geometric components, i.e., the kind of functional, physical or even geometric information in a context, are the relevant elements and principles for a description of a situation.

[4] Note: According to Feist (2000: 62), "*qualitative physics* refers to the Ground's exerting a force on the figure that encounters the force of gravity. This force can come from below, as when a book rests atop a table [...]*".*

In reference to gestalts of force concerning animate and inanimate entities, Johnson (1987: 81-83) introduces some features of force regarding objects (inanimate) and people (animate):

- A force schema involves energy or even the intensity of force. When this force produces an effect on us or an object, we perceive it in the perceptual area. The character of a force is experimented within an interaction (see figure 10).

- The schema of force involves the movement of an object in a specific direction, that is to say, a vector quality or a direction and course followed by something. The object may be changed or moved to another position in this movement, or the force applied does not move the inanimate object.

- In the schema of force, there is a *path of motion* that is connected with the vector quality or a direction. In this schema, there should be a movement of a force vector along a path.

- The action of a force has *origins* and *sources*. The object under the influence of the force occurs because an agent with power moves another object, such as a cup that then, for example, moves from the middle of a table to the back of the table. This cup does not move by its own force but rather by the force of an agent that is animate.

- The action of force has a *degree of intensity*. In an area where there is a movement, the degree of power or intensity may be measured.

- When there is a force in an interaction, a *structure* or *a sequence of causality* (relating to a cause) may be involved. For example, when a door closes, it could be because of a mechanism or the wind that was in action causing it to close. In a sequence of causality, the agent could be either animate and a being of existence or an inanimate object and event. In both cases, the significant forces are described by a human experience and perception in relation to a structure or a sequence.

Force-dynamics properties are also commented on by Talmy (2000: 435), referring to *repose*, *animation* and *generativity* in a scale of animacy. The first concept, *repose* is considered to be the basic state in which there is no effort to move *something*. The second concept *animation* is involved with force properties in the physical process, and thus the physical process represents the force-dynamic situation. The third concept, *generativity* is considered to be the general inclination of force-dynamics properties in order to link or to fix the entities and having no specific limits.

The study of Olloqui-Redondo et al. (2019) presents the influence of animacy and the syntactic constructions to decide the preferred frame of reference for English and Spanish. Depending on the cultural context and social factors, the interpretations of

static lateral relations may vary in spatial relations. In the contrast of both languages, in Spanish, the preference is an intrinsic frame in inalienable possessions (i.e., that cannot be taken away). However, in the position of an object related to another object (relatum), when the relatum is not a usual and inalienable possession, the Spanish speakers prefer their own perspective (i.e., relative). In English, speakers focus on the syntactic constructions related to grammatical sentences. Thus, the linguistic characteristics and the inalienable possessions shed light on the distinction between these two languages.

Robinette et al. (2010) note the difference between the possessive constructions using Saxon genitive (the‘s particle) and non-possessive constructions. A possessive construction connects more with an intrinsic frame, such as *the teacup to the teapot's left,* than a non-possessive construction, such as *the teacup to the left of the teapot,* which often suggests a relative frame.

With regard to conceptual archetypes (Langacker, 2008: 355-356), the diversity of conceptual archetypes act as prototypes, being animate or inanimate. The common archetypes are the following:

- The creation of a scene into *the global setting* and the *animate participants*. These participants interact with each other and with inanimate objects, and they move into this scene and a *location*.

- The *interaction* in a *chain of action* is a force on a series of objects or participants from the first participant to the next one.

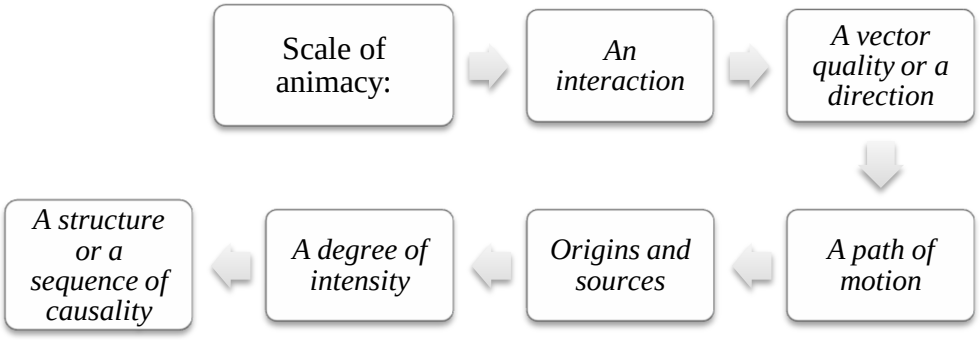
- Actions and events are considered archetypes in which there are participants, a location and a setting in one classification, and the participant's role is in another classification.

- In the latter case, one of the participants is the *agent* who does the interaction and the action of force in the initial process, and another participant is the *patient* who is often inanimate and is involved in the final process as a consequence of external forces.

- An agent often uses an instrument in action, usually an inanimate one. This *instrument* serves as an intermediary between the agent and the patient.

- Another participant is the *experiencer,* often animate, who refers to a perceptual experience. On the opposite side, there is a *mover* who may be inanimate and moves in connection with external forces.

Figure 10. The scale of animacy.



4.8 Relative function

The dimensions of topology, dynamics and function should be considered each in a parameter of similar significance to provide the specific meaning of prepositions (Navarro i Ferrando, 1998, 2001, 2006a; Silvestre-López, 2009: 51-64). In context, each preposition presents a concrete functional relation between TR and LM, such as control, operation, intentionality, among others (Navarro i Ferrando, 2006a). The functional relation develops from bodily experience, interaction and movement in scenes. In this section, the pattern of function and, specifically, relative function is presented.

Furthermore, image schemas are often viewed as abstract concepts over experiences. These concepts mean representations of experiences and somehow extract certain structural elements that are common to all experiences. Words may associate complex combinations of image-schematic structures where the relative function of the participants constitutes a crucial element in the conceptualisation (Dodge & Lakoff, 2005: 57-85).

Regarding prepositions, *over* presents a semantic extent (Deane, 2005: 235-268) that can be rephrased as *above*, *across* or *on*. Including various themes of the possible Brugman-Lakoff analysis:

-Verticality: *the lamp hangs over the table.*

-Boundary-traversal: *he walked over the hill.*

-Surmounting: *he jumped over the wall.*

-Covering: *he put his hands over his face.*

-Potential interaction: *pull the lamp over the table.*

-Contact or absence: *Harry climbed all over the canyon walls.*

From these themes, only one potential interaction is related to relative function.

In short, the sense of *over* is a schema including both topological and functional dimensions instead of just metric similarity.

Moreover, Vandeloise (1991: 89-98) indicates that prepositions connote a geometric analysis, including a localisation, concepts of simple physics, possible encounter, and also lateral or general orientation. For instance, let us look at these examples: *The thread is in the pliers* (gripping tool). *The thread is in the clothes peg* (clip for hanging laundry). These sentences present the same geometric relation, but the distinction is in the functional relation, the presence or absence of containment.

Similarly, Herskovits (1986) also mentions function, perspective, and topological structure, although this author proposes typical geometric meanings. Vandeloise (1991: 89-98) indicates that the principal reference frames for humans are attached to the line of sight, the frontal or lateral orientation, and the direction of movement or interaction, and also, the vertical gravity (gravity always acts towards the centre of the earth, therefore, downwards, in a vertical direction).

Image-based semantic representations, like a piece of fruit, are difficult to imagine without the illustration of a specific colour or shape. Some linguists suggest images are inadequate for the representation of abstract concepts. These objections relate to visible force: there is a coordinate connection between meanings and images. These images are mere perceptual experiences without complex or abstract structure. These images can represent the function between TR and LM.

As for functional relations and lexical specification (Coventry, 1998: 247-262), functional relations are understood as spatial relations between objects and how these relations interact with each object. There are two types of confusing situations and errors that speakers may be aware of. The first one is when the preposition is not suitable (*decoding errors*). Here the language can suggest a model of a scene, therefore, an interpretation. The second one is when the lexical entry is not suitable within the sentence (*encoding errors*). Here, a spatial scene with derived models of scenes can be suggested to convert a sentence into a rule.

Cognitive linguists have coined the term *experientialism* for concepts related to the experienced world. This term is supported by empirical proof so that prepositional uses are not decided by spatial relations but by functional relations. Lakoff (1987: 420-424) suggests that a full and specified lexical entry should be determined to embody polysemy in sentences and to identify a selection of senses in context. In this case, the prototype can be valid to avoid homonymy. This is because there are many senses that share no single feature at all and therefore are described as homonymy.

This lexical specification can be presented by three levels (Coventry, 1998). The first one (on the right) is the real situation in the world (a spatial scene). The second one (on the left) is the knowledge about language that comes to mind. Finally, the third one (in

the middle) is language use, the information stored in the mind and the interaction with the real situation of the world itself. Thus, in most approaches there is a coordinated mapping of spatial relations with the meaning of a concept.

For instance, Herskovits (1986: 128-130) classifies prepositions onto a map of spatial relations with the relationship between the concept, language use and interaction with the world. However, Herskovits and some other linguists (Coventry, 1998: 250-260) made three errors of methodology. The first is that the interpretation of the meaning is not a direct reflection. The second error is when confusion of categories and lexical concepts without a principle occurs. Since first of all, it is necessary to categorise relations, and after that, it is necessary to map the spatial relations onto language use. The third one is to understand geometry before making an interpretation of meaning.

In short, the relations are between a language and the world, and a prior knowledge influences language use (Coventry, 1998). Functional relations present information from the real world about object functions. For a representation, one must introduce a spatial scene and that aforementioned knowledge along with the information stored in the mind. These models of scenes are formed by the continuity or discontinuity of a figure and a ground, functions of objects, movement over time and knowledge of types of interactions. Moreover, empirical data is needed for comprehension and to facilitate the corrections of any possible confusions within decoding (to interpret a code or to extract meaning from written symbols) and encoding (to convert information into code) errors.

Briefly, a relative function implies perceptual experiences, functional relations (spatial relations between objects and how these relations interact with each object), lexical specification, the position of the objects and the three dimensions (topology, dynamics and function).

Sentences involving spatial prepositions express where an object (located object) is located in relation to another object (reference object). Understanding the meaning of such expressions is relevant since they are a set of closed class terms and have the role of organising structure for conceptual material. Most approaches to spatial prepositions require properties of the objects involved as restraints on their use (Coventry, Cangelosi, Rajapakse, Bacon, Newstead, Joyce & Richards, 2004: 98-110).

Coventry et al. (2004) present an overview of the functional geometric framework, *what* and *where* information together to support the specific meaning of spatial terms, and finally, an outline of the implementation of this framework. As computational models have focused on mapping particular prepositions onto geometric estimations in the scene where they are described, this computational model is observed for the processing of visual scenes and the determination of the appropriate spatial preposition in particular contexts.

This model consists of three main sections: Vision Processing (visual object recognition, spatial location and motion information), Elman Network (predictive, time-

delay connectionist network), and Dual-Route Network (feed-forward neural network, that obtains in input the grounded *visual* information and linguistic data, such as the name of the located object, the name of the reference object and the spatial prepositions *over, above, below, under*). This model is both able to clarify what happens to objects in a scene and to describe where objects are added in a scene and in a context within these prepositions *over, under, above or below*.

In general, *semantic* representations encode specific information about objects in a scene, whereas *pragmatic* representations encode visual characteristics in relation to affordances, such as the very many visual characteristics used in planning motor programs for handling objects. These points include information about size, weight, the shape of objects, or location of handles. Then, specific knowledge about objects is also necessary, such as a *dish* or *plate,* as they realise a containment or a support relation.

Implementing the functional geometric framework (Coventry et al., 2004), the following experiments are considered, and three variant reference objects, a plate, a dish and a bowl, are involved in the scene. Each container is introduced in each of 3 x 2 positions *higher* than the other objects, corresponding to the three levels of distance on the *x*-axis and two levels on the *y* axis from the other object. The container is presented to pour liquid until it ends up inside the plate, dish or bowl (the functional condition), or to avoid the plate, dish or bowl (non-functional condition) or when the liquid has not been poured.

In the first experiment, participants watch films of the pouring scenes and then of the static scenes when no movement is involved. The results show the effects of geometry and function together with interactions. Experiment 2 compares the entire films with just the end states, and then watching them makes no difference to the otherwise appropriate classification.

Indeed, experiment 3 compares the end states to an earlier frame in the film in order to estimate whether participants predict what will happen to the liquid. The last one, experiment 4 confirms this information by discovering a correlation between decisions of how much of the liquid make contact with the pertinent part of the plate, dish and bowl and a correlation with relations for *over, under, above or below*.

These experiments show that participants employ both information about the geometry in the scene and the interaction information between the pouring container and a recipient container in the scene. Accordingly, the influence of geometry is stronger for *above/below* than for *over/under,* while the influence of function (whether the liquid enters or misses the container or is predicted to enter or miss the container) is stronger for *over/under* than for *above/below*. So, data from these experiments are used for testing and learning with the model commented on above in order to see the relevance of the position of the objects themselves.

In addition, even high-level students experience difficulties in learning prepositions and in using them correctly in conversations. As Carrillo & Ferreira (2020) show in a study

on some of the common mistakes when a speaker of Spanish uses the prepositions *a, en, de, para* and *por*, that speaker may have difficulty in translating them into English because in Spanish these prepositions are sometimes added and sometimes omitted depending on context (*e.g.*, in Spanish *depender de* and *llegar (a))*. Their equivalent English verbs *to depend on* and *to arrive at* always take a preposition (except when a verb is in imperative).

Cognitive Linguistics approaches offer an alternative to the traditional ways of learning by memorising distinct contexts. Bratoz (2014) suggests a pedagogical approach in which the theory can be translated into practical proposals by regarding the central uses of the prepositions *in, on* and *at*. Here, the aim is to point out the benefits of cross-linguistic differences between the native (L1) and target language (L2) and the cultural context. In this article, the experimental group who work with this approach are more accurate in marking the correct preposition. Thus, a Cognitive Linguistics approach focuses on a clarification of errors and a reduction of rote learning and memorisation. Further experimental research should be done in this line to facilitate the learning of a foreign language.

4.9 Determining different senses

Tyler & Evans (2003: 43-44; 48; 73-74; 76-79), consider that linguistic analysis may be subjective, and for this reason, propose a methodology for determining senses and, therefore, minimising that subjective bias. In view of this proposal, two criteria determine a distinct sense of a preposition.

As for the first one, a sense may be distinct when the containing information is an additional meaning, that is to say when a distinct sense involves a non-spatial meaning or a distinct feature of the proto-scene where the TR and the LM are conceptualised. The second one is when the sense is independent of the context, that is, in the case where the distinct sense is not deduced from another sense in that context.

For instance, *1. The helicopter hovered over the ocean. 2. The hummingbird hovered over the flower.* Here, the preposition *over* denotes a spatial relation where the TR is higher than the LM. 1 and 2 do not include additional meaning. However, in 3 and 4, the distinct sense appears. *3. Joan nailed a board over the hole in the ceiling. 4. Joan nailed a board over the hole in the wall.*

In examples 3 and 4, the preposition *over* does not mean to enter into a spatial configuration to the LM. In example 3, the axis is horizontal, and the TR, *the board* is below the LM, *the hole in the ceiling*. In example 4, the axis is vertical, and the TR, *the board* is next to the LM, *the hole in the wall*. Essentially, the preposition *over* covers the hole obscuring the view, and in this case, this notion is an additional meaning. Hence, the first criterion applies, and the second one does not appear since there is no way to

see the meaning of *covering* from context. Supposing that the primary sense of *over* involves a spatial relation and the TR is higher than the LM.

In addition, in 5. *The tablecloth is over the table*, the meaning *covering* appears from the context. The TR, *The tablecloth* is in contact with the table and higher than the LM. Hence, the interpretation is that part of the table is covered and obscured from view because of the position of the tablecloth over the table. However, such interpretation is not likely to appear in examples 3 and 4. Since in 3, it is understood that the board is below the ceiling, and in example 4, it is understood that the board is *next to* the wall. There is not an additional meaning that is derived from context.

Generally, in semantic networks, there is a primary sense connected with spatial relations and other senses derived from this primary sense. One of the difficulties is sometimes to know which sense is the most appropriate for being identified as a primary sense. The primary sense of *over* means *above* and *across*, and Lakoff adds a TR moving along a path such as *the plane flew over the city* (Lakoff, 1987; Brugman & Lakoff, 1988). Thus, this prototypical sense is situated in the central position, and others are in the peripheral area.

Therefore, some questions may arise related to the issue of the **prototype** (Tyler & Evans, 2003: 45-50). For instance:

- Is a prototypical sense the most frequently used?
- Is it the linguistic form that native speakers agree is *the most basic*?
- Is it the one that shows the most specific form?

The prototype notion is useful for categorising objects and perception, but it is sometimes unreliable for non-objects and relations or processes.

Moreover, in some cases, two types of evidence for choosing a primary sense without arbitrariness are suggested. This linguistic evidence adds these two types: the first is the earliest confirmed meaning, and the second is the predominance within a semantic network. For instance, there are fifteen distinct senses of the preposition *over*. From this methodology, eight involve configurations where the TR is higher than the LM; four involve configurations where the TR is on the other side of the LM; one includes some configurations of covering, and two include spatial reflexivity. Hence, the predominance criterion suggests the primary sense of *over* is for a scene where the TR is higher than the LM.

Turning to the distinct sense, language is considered to be a system based on usage and at the same time, it is considered as evolving from grammatical aspects. This distinct sense is related to the primary sense, and indeed, this distinct sense should be found in corpora instances. However, some linguists express disapproval towards increasing the number of senses (Sandra & Rice, 1995; Tyler & Evans, 2003). In fact, the process of analysing senses aims to establish distinct meanings. Then, considering the fact that

there is no standard agreement in assigning senses to prepositions, the principle proposed by Tyler & Evans (2003) should be taken into consideration.

In a recent experimental study of the abstract prepositions *in* and *on*, Johansson Falck (2018) has noted that the use of metaphorical or literal language and the correspondent comprehension are controlled by embodied experience procedures (e.g., Bergen & Wheeler (2010: 150-158) mentioning also muscular movement or perceptual skills added through experience with the body, world and mind).

In order to determine the senses of prepositions, a related classification focuses on the terminology assigned (Johansson Falck, 2018). The notions involved in the case study of abstract *in* and *on* are categories connected to the varieties of body-world knowledge.

In Cognitive Linguistics, learners are inclined to accept that abstract *in* and *on* come from the central spatial locations or relations (Lindstromberg, 2010; Navarro i Ferrando, 1999, 2000). Hence, the linguistic analysis of Johansson Falck presents that the abstract uses of *in* and *on* are categories of associated notions analysed with the spatial relationships related with the prepositions and embodied perceptions and experiences of concepts. Remarkably, the exchange of experiences and the communication of meanings show helpful information in terms of learning and teaching English for L2 students. Thus, students work with both grammar and embodied motivation.

Language expresses bodily feelings, whereas the mind (e.g., fear, happiness, love or ambition) is seen as a container for memorising concepts. Students worked with the categories *in* and *on,* and the connections of these categories with the body-world knowledge were learning points for them. Thus, experiences influenced the constructions and pictures (e.g., the learners' design in which a heavy burden is carried). In conclusion, Johansson Falck shows the motivation for practising grammar and doing so in an amusing way rather than just asking for the correct answer, attaining a positive result in the learning process.

4.9.1 The primary sense of a preposition

Some questions about the primary sense may arise: Which one is the primary sense? How do linguists decide on the primary sense? What kind of evidence needs to be accounted for? Is information from dictionaries reliable?

In this subsection, I have looked up the definitions of prepositions (*at, beside, by, near,* and *next to*) from the *Concise Oxford English Dictionary* (Stevenson & Waite, 2011). As a first approximation to the assumed primary sense of each preposition, I write the definitions of each preposition in the same order of reference used in this dictionary:

- The preposition *at*:
- *prep. 1. expressing location or arrival in a particular place or position. Used in speech to indicate the sign @ in email addresses. 2. expressing the*

time when an event takes place. 3. expressing attendance of an educational institution or a workplace. 4. denoting a particular point or segment on a scale. Referring to someone's age. 5. expressing a particular state or condition. Expressing a relationship between an individual and a skill. 6. expressing the object or target of a look, shot, action, or plan. Expressing an incomplete or attempted action. 7. expressing the means by which something is done.

- The preposition *beside*:
- *prep. 1. at the side of; next to. Compared with. 2. In addition to; apart from.*

- The preposition *by*:
- *prep. 1. through the agency or means of. Indicating how something happens. 2. indicating a quantity or amount, or the size of a margin. Identifying a parameter. Expressing multiplication, especially in dimensions. 3. indicating the end of a time period. 4. near to; beside. Past and beyond. 5. during. 6. according to.*

- The preposition *near*:
- *prep. (also near to). 1. at or to a short distance away from (a place). 2. a short period of time from. 3. almost. 4. similar to.*

- The preposition *next to:*
- *prep. archaic next to. Phrases next to: 1. beside. 2. following in order or importance. 3. almost. 4. in comparison with.*

In my research, I consider the concrete senses separated from the metaphorical senses. The metaphorical instances found through *the Metaphor Identification Procedure (MIP)* (Pragglejaz Group, 2007: 3) are not included in this analysis.

In order to rule out metaphorical instances, the MIP is applied in the following steps, as for the prepositions analysed in this study:

1. First of all, read the text to understand the meaning of the text in a general way.

2. Identify the lexical items in the explanation of the text.

3. a) In each lexical item, find the meaning from the context, so that a relation is suggested by the text. In the contextual meaning, consider what information is before and after the lexical item.

   b) Ask whether this word has more basic meanings than the one in the context. A basic meaning is likely to be:

- A concrete sense, that is easy to understand, see or hear.
- A bodily experience with action.
- An accurate and specific meaning and not a vague explanation.
- Traditionally older.
- A basic meaning need not necessarily be a frequent meaning.

c) Compare the meaning of this word and whether the contextual connotation varies from the basic meaning, and how this text may be interpreted.

4. When the answer is affirmative, the meaning of the word varies from the basic meaning, then, this word has a metaphorical sense.

Chapter 5: Research questions and hypotheses

Though there has been progress in adding new accounts in the field of Semantics, some questions have arisen and still need to be developed by researchers: why has spatial semantics received such attention? What have linguists and researchers done about the polysemy of prepositions? What have they not done yet? What have they not done following a suitable procedure?

The field of spatial semantics has attracted much interest from the 1980s to now. One of the bases for this intense interest is that spatial semantics observes the main characteristics of human perception and experience. Additionally, there are close similarities between a relative position in space, bearings and other structures of spatial orientation such as temporal or abstract extensions of meanings relative to spatial concepts.

In terms of prepositional usages, there is still no precise approach that facilitates a set of criteria to choose and know which preposition may be convenient in context with nouns, adjectives or verbs. In dictionaries, however, there are short explanations of these meanings. After these definitions, some examples are given but not an interpretation of meaning in context.

Research questions about the parameters of this study:

Topology: Is topology a significant parameter in defining the meaning of a preposition, and to what extent?

Dynamics: Is dynamics a significant parameter in defining the meaning of a preposition, and to what extent?

Function: Is function a significant parameter in defining the meaning of a preposition, and to what extent?

Intentionality (function and dynamics): Within the parameter of dynamics and function, is intentionality relevant between a TR and an LM in determining the meaning of a preposition?

Frame of reference: Is the frame of reference a relevant parameter in determining the use of a preposition?

Relative position: Is asymmetry a relevant parameter between a TR and an LM in determining the use of a preposition?

Animacy: Is the animacy of a TR and an LM a relevant parameter in determining the use of a preposition?

Relative size: Is the relative size of a TR and an LM a relevant parameter in determining the use of a preposition?

Image schema: Is image schema a relevant parameter in determining the use of a preposition?

In the following, I formulate a hypothesis for the meaning of *at, beside, by, near* and *next to.* A hypothesis for the meaning of *at:*

According to the studies in sections 3.1 and 3.2, a hypothesis about the meaning of the preposition *at* may be developed. The hypothesis about the meaning of *at* consists of predicting a predominant value for each of the parameters established for the analysis in this study (see section 1.3 and 6.2). Therefore, according to the parameters established for the analysis, it may be expected that the following values will appear as predominant:

Regarding topology, some authors propose that the predominant value is the sense of coincidence, while others claim that the predominant value is the reference point. Then, the hypothesis may point to a sense of coincidence or a reference point (Deane, 1993; Navarro i Ferrando & Gösser, 2011; Knaś, 2007).

Regarding dynamics, in the consulted literature, most authors indicate that the predominant value is the sense of horizontal movement by a frontal position of a TR. In view of that, the hypothesis points to a sense of horizontal movement by a frontal position of a TR (Deane, 1993; Navarro i Ferrando & Gösser, 2011).

Regarding function, in the consulted literature, most authors indicate that the predominant value is the sense of usage or manipulation. Then, the hypothesis points to a sense of usage or manipulation (Vandeloise, 1991; Deane, 1993; Navarro i Ferrando & Gösser, 2011).

Regarding the intentionality of dynamics and function, there is little information about this parameter. The hypothesis may point to no mutual attention from the position of the TR to the LM, including an active TR and a passive LM (Navarro i Ferrando & Gösser, 2011).

Regarding the frame of reference, most authors show that the predominant value is the intrinsic frame of reference. Given that, the hypothesis points to an intrinsic frame of reference (Vandeloise, 1991; Kokorniak, 2007).

Regarding the relative position of a TR and an LM, most authors in the literature indicate that the predominant value is asymmetry. In that case, the hypothesis points to an asymmetry position (Vandeloise, 1991; Kokorniak, 2007).

Regarding animacy, in the consulted literature, most authors think that the LM is a location without precision and with a reference point. Therefore, this is an inanimate LM. No author has dealt with animacy for a TR and an LM. On that account, the hypothesis may point to an animate TR and an inanimate LM (Herskovits, 1986; Knaś, 2007).

No author has dealt with the relative size of a TR and an LM. Some authors indicate that the LM is a location without precision and a reference point. On that account, the hypothesis points to the TR as smaller than the LM, as in TR<LM (Herskovits, 1986; Knaś, 2007).

Regarding image schema, there are no analyses focused on this aspect in the consulted literature. Although CG studies image schemas, the analyses on the preposition *at* do not clearly define image schemas for this preposition. Then, the hypothesis may point to any of the three groups of image schemas (topological schema, spatial schema or a force schema).

A hypothesis for the meaning of *beside:*

According to the studies of section 3.3, the formulation of a hypothesis about the meaning of the preposition *beside* may be put forward. The hypothesis about the meaning of *beside* consists of predicting a predominant value for each of the parameters established for the analysis in this study (see section 6.2). Therefore, according to the parameters established for the analysis, it may be expected that the following semantic values will occur as predominant:

With regard to topology, most authors show that the predominant sense is proximity. *The definition of the preposition beside is at the side of, next to or compared with. Beside may be rephrased as "by the side of, close to" and typically excludes contact between the TR and the LM.* Then, the hypothesis points to a value of proximity (Langacker 1987, 2008; Brenda, 2017, 2019; Lindstromberg, 2010; Rissanen, 2004; Stevenson & Waite, 2011).

With regard to dynamics, no analyses focus on this aspect in the literature. *Beside* is understood as an entity being *by the side of* or *close to* another entity and does not typically include contact between the TR and LM. *Beside* carries the meaning of a location in spatial proximity, extending from a TR to the sides of an LM. These uses of *beside* have special features not relative to a convex or rounded surface. On that account, the hypothesis points to a sense of horizontal movement by/along with the side of an LM (Lindstromberg, 2010; Zwarts & Gärdenfors, 2016).

With regard to function, spatial language may be in equilibrium with space and functionality. In the representation of a model, this specific function has an effect such as accessibility or interaction in a scene with a specific object. Then, the hypothesis points to a sense of accessibility or interaction (Coventry, Carmichael & Garrod, 1994).

With regard to the intentionality of dynamics and function, there is little information about this parameter. *Beside* indicates the location of an object or a person in a close position to a place. The TR may be an animate or an inanimate entity. In view of that, the hypothesis may point to no mutual attention between the TR and the LM, including an active or passive TR and a passive LM (Rissanen, 2004).

With regard to the frame of reference, the preposition *beside* carries the meaning of a location in spatial proximity, extending from a TR to the sides of an LM. Therefore, the hypothesis points to an intrinsic frame of reference because of the position of a TR proximal to the intrinsic side of an LM (Zwarts & Gärdenfors, 2016).

There is little information about the relative position of a TR and an LM. The majority of authors indicate that the predominant value is asymmetry in horizontal positions. Then, the hypothesis points to an asymmetrical relative position (Vandeloise, 1991; Kokorniak, 2007).

With regard to animacy, *beside* indicates the location of an object or a person in a close position to a place. The TR may be an animate or an inanimate entity. Therefore, the hypothesis predicts an animate or inanimate TR and an inanimate LM (Rissanen, 2004).

There is little information regarding the relative size of a TR and an LM. *Beside* indicates the location of an object or a person in a close position to a place. The TR may be an animate or an inanimate entity. Then, the hypothesis may point to a smaller TR than the LM, as in TR<LM (Rissanen, 2004).

With regard to image schemas, there is little information about the analysis of this aspect. A proximity image schema is plausible for *beside* encoding horizontal directions. That being the case, the hypothesis may point to a topological proximity schema (Langacker, 1987, 2008; Brenda, 2017, 2019).

A hypothesis for the meaning of *by:*

According to the studies of sections 3.2 and 3.4, a hypothesis about the semantic values of the preposition *by* can be put forward. The hypothesis about the meaning of *by* consists of predicting a predominant value for each of the parameters established for the analysis in this study (see section 6.2). Therefore, according to these parameters, it may be expected that the following values will occur as predominant:

Each study points at a different sense regarding topology, which brings about a controversial issue. Some authors claim that the predominant value is proximity. There is an object that is better described by the preposition *by* than by *near* because of its closer proximity, and there is a presence in the vicinity of an object in an unspecified horizontal region and a distant region. *By* may also indicate a reference point. In the vicinity sense, the object may or may not be in contact. Then, the hypothesis may point to a sense of proximity or a reference point (Langacker, 2008; Brenda, 2017; Knaś, 2007; Lindstromber, 2010: 146-150; Quirk et al., 1985: 687-713).

In relation to dynamics, some authors indicate that the predominant value is the sense of horizontal movement facing the side related to the LM, or next to the side of the LM. The motion sense may be a motion without stopping at a point of the LM, or an intermediate stop. That being the case, the hypothesis points to a sense of horizontal movement facing the side, or next to the side of the LM without stopping or an intermediate stop (Knaś, 2007; Lindstromberg, 2010).

In relation to function, some authors indicate that the predominant value is the agency sense that appears in passive sentences and introduces a creator of the action. A TR is an action in passive construction and an LM is a creator of the action. In his study, Langacker tries to incorporate the passive use of *by* in the same network with other uses of *by*. In the uses of *by*, there is an observer through the scene who focuses more on the details. Then, the hypothesis points to the agency sense (Langacker, 1991: 139-140; Kokorniak, 2007: 120).

In relation to the intentionality of dynamics and function, no author has dealt with the aspect of mutual attention versus no mutual attention. A TR receives an action in passive constructions and an LM is a creator or participant in the uses of *by*. Then, the hypothesis may point to no mutual attention between the TR and the LM including a passive TR and an active LM (Langacker, 1991: 139-140).

In relation to the frame of reference, no author has dealt with this aspect. Then, the hypothesis may point to a relative or an intrinsic frame of reference.

In relation to the relative position of a TR and an LM, there is little information about this aspect. In the uses of *by*, the predominant value may be asymmetry since a TR is an action in passive construction and an LM is a creator or participant of the action. On that account, the hypothesis points to an asymmetry position (Langacker, 1991: 139-140).

In relation to animacy, no author has dealt with this aspect. If an LM is a creator or participant in the passive constructions, the LM may be animate. Then, the hypothesis may point to an inanimate TR and an animate LM (Langacker, 1991: 139-140).

In relation to the relative size of a TR and an LM, no author has dealt with this aspect. If an LM is a creator or participant in the passive constructions, the LM will be small. Then, the hypothesis points to the TR that is bigger than the LM as in TR>LM (Langacker, 1991: 139-140).

In relation to image schema, no author has dealt with this aspect. Then, the hypothesis may point to spatial schema or a force schema because of the uses of *by* in passive constructions.

A hypothesis for the meaning of *near*:

According to the studies of section 3.5, the formulation of a hypothesis about the meaning of the preposition *near* is open to development. The hypothesis about the meaning of *near* consists of predicting a predominant value for each one of the parameters established for the analysis in this study (see section 6.2). Therefore, according to the parameters established for the analysis, it may be expected that the following values will appear as predominant:

Concerning topology, the preposition *near* means *not far away in distance* (Cambridge dictionary). In the consulted literature, the primary sense of the preposition *near* is in

the vicinity which contains an object. The prepositions *by* and *near* indicate proximity, horizontal directions and a presence in the vicinity of an object in an unspecified horizontal region, but *by* indicates a closer object than *near*. The difference between the preposition *near* and *by* refers to the lack or presence of contact between a TR and an LM. The similarity between the preposition *beside* and *near* is that they carry the meaning of a location in a spatial proximity which extends from a TR to the sides of an LM. In the approach sense, the proximity connoted by *near* may be interpreted in situations in which people are coming closer to a certain physical, emotional or conceptual state.

That being so, the hypothesis of topology points to a sense of proximity or contiguity (in the vicinity). *By* refers to a location of a closer object than *near*. In the case of *near*, the location refers to an unspecified horizontal zone and an undetermined orientation of LM (Johnson, 1987; Langacker, 1987, 1991, 2008; Lindstromberg, 2010; Zwarts & Gärdenfors, 2016; Brenda, 2017).

Concerning dynamics, some authors indicate that the predominant value is the sense of horizontal movement to a relative orientation of an LM. *Near* refers to a presence in the vicinity of an object being near or moving near in an undetermined orientation. In my analysis of the examples of *near*, there is only horizontal plane. Then, the hypothesis points to a movement to an undetermined orientation of an LM. (Zwarts & Gärdenfors, 2016; Langacker, 1987, 1991, 2008; Brenda, 2017).

Concerning function, the predominant value is interaction. The interaction sense with the preposition *near* is understood with verbs connoting motion (*come, go, get*) or permission (*let and allow*). In view of this, the hypothesis points to an interaction between the TR and LM (Brenda, 2017).

Concerning the intentionality of dynamics and function, no author has dealt with the aspect of mutual attention or no mutual attention between the TR and LM. Then, the hypothesis may point to a predominant value of mutual attention or no mutual attention between an active or passive TR and an active or passive LM (Langacker, 1991: 139-140).

Concerning the frame of reference, some authors indicate that the predominant value is intrinsic in reference to the use of the prepositions *beside* and *near*. The prepositions *beside* and *near* carry the meaning of a location in a spatial proximity which extends from a TR to the sides of an LM. On that account, the hypothesis may point to an intrinsic frame of reference due to the position of a TR to the sides of an LM (Zwarts & Gärdenfors, 2016).

Concerning the relative position of a TR and an LM, the predominant value is a symmetrical relation in the perception that a TR is near the LM, and the LM is near this TR. Then, the hypothesis may point to a symmetrical relative position (Langacker, 2008).

Concerning animacy, no author has dealt with the aspect of the preposition *near*. A study indicates the main role of prepositions is to determine these spatial relations in various places and with regard to objects, so that specifications of movements and changes are seen in these relations and these are also represented by vectors or directions. Then, the hypothesis may point to an animate or an inanimate TR and an animate or an inanimate LM (O'Keefe, 1996: 281).

Concerning the relative size of a TR and an LM, no author has dealt with this aspect. Then, the hypothesis points to any of the three possibilities, the TR that is bigger than the LM as in TR>LM, the TR that is smaller than the LM as in TR<LM or the equal relative size as in TR=LM (Langacker, 1991: 139-140).

Concerning image schema, a study explains that *near* may represent a near-far image schema, together with the centre-periphery and scale schemas to determine the distance. In that case, the hypothesis points to the centre-periphery (near-far) or the scale image schema (I only analyse height or distance for the scale image schema) (Johnson, 1987).

A hypothesis for the meaning of *next to:*

According to the studies of section 3.6, the formulation of a hypothesis about the meaning of the preposition *next to* is open to development. The hypothesis about the meaning of *next to* consists of predicting a predominant value for each of the parameters established for the analysis in this study (see section 6.2). Therefore, according to the parameters established for the analysis, it may be expected that the following values will appear as predominant:

As for topology, the definition of *next to* says: *used when describing two people or things that are very close to each other with little or nothing between them; beside.* The prepositions *next to* and *beside* also relate to the spatial structure in the horizontal plane. *Next to* implies a sequential organisation of a TR and LM without any object intervening between them. The preposition *next to* refers to horizontal directions between two points, objects or persons. Those objects with an equivalent form are more likely to be located in such a way as to be in contact or touch rather than those that are noticeably dissimilar to each other in size.

Therefore, in the case of the preposition *next to,* the hypothesis of topology points to a sense of contiguity (very close to each other) with little or no space between them (Cambridge dictionary and English Oxford dictionary; Lindstromberg, 2010; Langacker, 1987, 2008; Brenda, 2017, 2019; Sowden & Blades, 1996).

As for dynamics, some authors argue that the predominant value is the sense of horizontal movement towards the lateral side of an LM. The preposition *next to* refers to horizontal directions and an intermediate entity between two points, objects or persons. Then, the hypothesis points to a horizontal movement towards the lateral side of an LM (Langacker 1987, 2008; Brenda, 2017, 2019).

As for function, no analysis in the consulted literature focuses on this aspect. A study indicates that the predominant value of next *to* carries a sequential organisation. *Next to* carries a sequential organisation of a TR and LM without any entity intervening between them. In that case, the hypothesis points to a sequential organisation or position between the TR and LM without any object intervening between them (Lindstromberg, 2010).

As for the intentionality of dynamics and function, no author has dealt with mutual attention or no mutual attention between the TR and LM. Then, the hypothesis may point to a predominant value of either of both mutual attention or no mutual attention between an active or passive TR and an active or passive LM (Langacker, 1991: 139-140).

As for the frame of reference, the predominant value is intrinsic in reference to using the preposition *next to* (*beside* and *near* also indicate an intrinsic frame). *Next to* carries a sequential organisation of a TR and LM without any object located between them. Then, the hypothesis may point to an intrinsic frame of reference due to the lateral side of an LM. (Lindstromberg, 2010).

As for the relative position of a TR and an LM, no author has dealt with the aspect of the preposition *next to*. Those objects which have an equivalent form are more likely to be located in such a way to be conceptualised in a contact or touch sense than those that are irregular objects. On that account, the hypothesis may point to a symmetrical or asymmetrical relative position (Sowden & Blades, 1996).

As for animacy, no author has dealt with this aspect of the preposition *next to*. The preposition *next to* refers to horizontal directions and an intermediate entity between two points, objects or persons. Then, the hypothesis may point to an animate or an inanimate TR and an animate or an inanimate LM. (Langacker 1987, 2008; Brenda, 2017, 2019).

No author has dealt with the relative size of a TR and an LM. Then, the hypothesis points to any of the three possibilities, the TR that is bigger than the LM as in TR>LM, the TR that is smaller than the LM as in TR<LM or the equal relative size as in TR=LM (Langacker, 1991: 139-140).

As for image schema, the representation of a proximity image schema is favoured by prepositions like *next to* that encode horizontal directions. The hypothesis points to the centre-periphery (near-far) image schema (Langacker 1987, 2008; Brenda, 2017, 2019).

Chapter 6: Methodology

In this chapter, the materials, the procedure and the definitions of sense parameters are introduced for a detailed analysis of the meanings of *at, beside, by, near* and *next to.* I describe the materials used, the process of analysis, the meaning of the parameters used in this study, and their values.

6.1 Materials

In reference to the analysis of prepositions, the methodology used consists of extracting one thousand examples of each of these five prepositions, namely *at, beside, by*, *near* and *next to*, in a relevant context for plausible interpretation. That context may range between two to three sentences, with the purpose of clarifying the spatial scene. Additionally, it is necessary to plan a criterion to determine the statistics from this quantity of examples so that the results show how the English language is used for these specific prepositions. In this study, the examples are extracted from a simple search on the *British National Corpus* (BNC). A question may arise: how many instances are necessary for reliable and statistically significant analysis in Linguistics? What instances of prepositions should be included and excluded in this analysis?

A corpus provides real examples of words and grammatical structures in context, and its quantitative use is valuable for linguistic analysis. Considering the measurement (Janda, 2013: 4-7), the reliability increases in proportion to the number of examples (the more examples used, the more accurate the results).

A quantitative corpus analysis in Linguistics should be acceptable with one thousand random examples. Johansson Falck & Gibbs (2012) present a combination of corpus data from the *British National Corpus (BNC)* and experimental research with one thousand examples, indicating how physical experiences motivate metaphorical understanding. For example, Johansson Falck (2013) also analyses one thousand random instances from the BNC for two other papers, working with the terms *path, road* and *way*, and the verbs accompanying these terms (2010). Johansson Falck (2017) also analyses one thousand instances of abstract uses of *in* and *on* from the BNC. These instances include spatial, abstract and temporal uses of these two prepositions. Navarro i Ferrando & Gösser (2011) propose the semantic structure of *behind* focused on the three meaning dimensions of topology, force-dynamics and function analysing a sample of one thousand examples drawn from the BNC.

The material for the analysis in this study consists of 1,000 examples of each of five prepositions (*at, beside, by, near* and *next to*). First, the scope of each example is read and interpreted in a context of several lines extracted from the corpus of a range of genres (spoken, fiction, magazines, newspapers, academic papers, among others). From these, I chose the genre of fiction books and newspapers. I propose a comparative study of the variation and frequency in the use of these five prepositions identifying each semantic parameter in the analysis. Recognising that learning the uses of prepositions is to command the literal or physical uses primarily, I start with these senses, including the

corresponding parameters. Thus, in this analysis, the included senses are the literal or concrete, conceptualising physical perceptions. On the other hand, metaphorical meanings and idiomatic expressions are excluded (see the list in section 6.1.1).

For deciding which instances are metaphoric, *the Metaphor Identification Procedure (MIP)* was employed (Pragglejaz Group (2007). Throughout the process, the aim is to identify the following structures of nominal forms and verb particle forms:

- Noun + preposition + noun (*e.g., a picnic at the beach*).
- Verb + preposition + noun (*e.g., look at somebody*).
- Adjective + preposition + noun (*e.g., good at tennis*).
- Metonymic extensions of the spatial *at* involving people in events and activities (*e.g., at the party, at the concert, at the meeting, at school*).
- The domain of a scale including a distance or height (*e.g. work at height*) but excluding the metaphor of a scale of values (e*.g. at 0,7 kg, at a speed of 1km/h*).
- The grammatical construction of passive voice including an agent (*e.g., the dialogue was written by us*).

These examples depict physical perception scenes in which the TR and the LM are nouns. Phrasal verbs with diverse meanings are excluded. For our purposes, spatial instances include a spatial TR and a spatial LM. The prepositional categories which have emerged from the corpus are compared in tables including the following parameters:

- The percentage of the three dimensions (topology, dynamics and function), animacy TR, animacy LM, each frame of reference (relative, intrinsic and absolute), the intentionality, the relative position, the relative size and the image schema are compared.

This research focuses on prepositions and spatial relations of horizontal directions. To understand these settings, I explain the representation of these prepositions that need topological characteristics and a description of image schemas. These topological concepts are applied to recognise how a preposition depicts a precise spatial relation in mental scenes.

The three dimensions of topology, dynamics and function are identified for a spatial relationship between the TR and LM. Topology as one of these dimensions is described as an observed perception of objects that a speaker experiences. This speaker establishes coincidence, contact, proximity or inclusion on a topological arrangement (Navarro i Ferrando, 1998).

6.2 Procedure

The procedure considers the following parameters:

-The primary meaning (basic or prototypical) of each preposition and distinctions in construal (see section *4.9.1*).

-In the construals/interpretations: the location of entities, TR and LM, their interaction or other semantic parameters such as setting or the kind of process (see section 4.6)

-The dimensions of topology, dynamics and function between objects (Navarro i Ferrando, 1998) (see section 4.1.1).

-The scale of proximity or distance in a horizontal axis (see section 4.3).

-The active zones of TR and LM in a scene: the orientation to a side, the frontal part, mutual attention, facing each other or face-to-face. Orientation of the TR is determined or undetermined (see section 4.6).

-Spatial relations (static or dynamic) and directions through a horizontal axis (see section 4.4).

-The principles of construal in section 4.1 (Langacker, 2008): perspective (vantage point: a position of speaker and hearer; viewing arrangement: relation between viewers and the scene) or temporal dimension (processing time, dynamicity, conceived time, or reference point).

-The dimensions of imagery (see 4.1.3) (Langacker, 1991): the primary entity (TR) and secondary object (LM) of a scene; the level of specificity; in a scale, the scope of predication; the relative salience; construal; perspective.

-Frames of Reference (see 4.2) (Levinson, 2004): relative (viewer-centred), intrinsic (object-centred) or absolute (environment-centred).

-The control of the TR and the LM in each scene as for which of them controls the scene. The TR is exposed to the LM's constraints, influence or action (see section 4.8).

-The relative size or unequal relative size of the TR and the LM in a scene (see section 4.6).

-Force dynamics (Talmy, 2000): dynamic movement relations, a sequence or balance between TR and LM (see section 4.4).

-Image Schemas (Johnson, 1987): spatial motion group, force group, balance group (see section 4.5).

-Image Schemas (Lakoff, 1987): transformational group and spatial group (see section 4.5).

-Horizontal orientation (Talmy, 2000): symmetry or asymmetry of the TR and the LM (see section 4.6).

-The scale of animacy for humans, animals, mobile objects, static objects or others for both TR and LM (Feist, 2000) (see section 4.7).

-Relative function (Vandeloise, 1991): functional relations of control, operation, interaction or accessibility (see section 4.8).

In summary, four main areas of meaning are analysed for every instance, namely dimensional parameters, frames of reference, image schemas and dimensions of construal.

1. I consider the most relevant perceptual dimension among topology, dynamics or function in each example (see sections 4.1.1 and 4.3). These three parameters are realised in every spatial relation (Navarro i Ferrando, 1998):

- Topology: reference point, coincidence, contact, contiguity, proximity, separation or distance; in case something might be in between the entities (*e.g., the botanic centre is near the hotel*. Something may be in between these buildings); the relative size of TR and LM (TR=LM, TR>LM or TR<LM); symmetry/asymmetry (the same or different position or size).

- Dynamics: vertical/horizontal axis, gravity, orientation (*e.g., look at*), motion, pressure, sequence, stative, or balance (in cases that there is a verb, the balance information comes from the verb such as *sit down*); relative orientation (undetermined for *near*), lateral orientation (*e.g., next to*); degree of animacy for both TR and LM (animate or inanimate); the relative size of TR and LM (TR=LM, TR>LM or TR<LM); symmetry/asymmetry (the same or different position or size).

- Function: control, operation/interaction, purpose (in order to), support, link, concealment (hiding), company, or accessibility; mutual attention or no mutual attention of TR and LM; degree of animacy for both TR and LM (animate or inanimate); the relative size of TR and LM (TR=LM, TR>LM or TR<LM); symmetry/asymmetry (the same or different position or size); TR and LM may be active or passive.

2. Regarding the **frame** of reference (see section 4.2) (Levinson, 2004), I consider which one best matches each example (intrinsic, absolute or relative) with the appropriate characteristics:

- Intrinsic: object-centred; non-speaker centric; directions are indicated; canonical positions of objects. Some examples are front/back, sides, lefts and rights. The speaker mentions specific sides.

- Absolute: environment-centred (cardinal directions such as North or South); fixed bearings; abstract notions, and environmental gradients (mountain slopes, wind directions or river drainages).

- Relative: viewer-centred; speaker-centred (centred on any of the speech participants); subjective (in a sentence, the subject *I* is the subtype named deictic. TR is inside the scene, such as *I was at home*). The speaker does not mention specific sides (in scenes with no corners, such as the *trees*).

3. As for image schemas (see section 4.5), I consider one image schema based on Johnson (1987), Lakoff (1987), Boers (1996), Cuyckens (1999) or Evans (2007). These schemas and their subgroups are detailed below:

a) Image schemas by Johnson (1987):

- Topology: containment; centre-periphery (near-far); scale: height or distance/ qualitative (degree of intensity) and quantitative (increase or decrease).

- Spatial motion: path (source-path-goal/from-to); cycle: complex cycles (breathing, walking-standing, wakening-falling asleep), cyclic processes (seasons, day and night, the stages of progress in animals or plants, the life cycle from birth to death), or cyclic climax *(rise* and *fall).*

- Force group: compulsion (obligation, force, pressure); counterforce (face-to-face); diversion (*against the wind*); removal of restraint (control, there is nothing blocking; e.g., *a door is opened*); enablement (there is an access in order to do an activity; e.g., *pick up*); attraction (*vacuum, magnet*); blockage; link (*family, snaps of coat*); and balance (axis, point, twin-pan and equilibrium).

b) Image schemas by Lakoff (1987):

- Transformations: following a trajectory; a path to end focus; multiplex to mass (*cattle* and *cows*, a single mass and groups); reflexive (a part of the entity is TR and another part is LM, use of prepositions *out/over*; e.g., *the syrup spread out*; *roll the log over*); rotation (blocks access of vision, continuous vision) or superimposition (the size increases and decreases).

- Spatial group: covering; above; across; contact; vertical orientation (*up-down*); length (extended TR, use of prepositions *over/up*), linear order.

c) An explanation based on Cuyckens (1999). Cuyckens (1999: 16-20) proposes two types of a path in the uses of the preposition *by*: the first type is from *by* as a *path along a course* (as means) to *by* as a passive agent, and the second type is from *by* as proximity to *by* as a passive agent. Then, the type of *path along a course* (as means) refers to a movement.

Underlying the different classifications above, I classify image schemas from an exhaustive list proposed by different authors (Johnson, 1987; Lakoff, 1987; Boers, 1996; Cuyckens, 1999; Evans, 2007):

- Topological space: front-back; left-right; centre-periphery (near-far); contact; straight; scale: height or distance/qualitative (degree of intensity) and quantitative (increase or decrease); covering; above; across; vertical orientation (*up-down*); length (extended TR, use of prepositions *over/up*); linear order.

- Containment: container; in-out; surface; full-empty; content.

- Locomotion/motion: momentum; path (source-path-goal/from-to); path along a course (means in the case of *by*); process.

- Locomotion/motion: cycle: complex cycles (breathing, walking-standing, wakening-falling asleep); cyclic processes (seasons, day and night, the stages of progress in animals or plants, and the life cycle from birth to death); cyclic climax *(rise* and *fall).*

- Balance: axis balance; twin-pan balance; point balance; equilibrium.

- Force: compulsion (obligation, force, pressure); blockage; counterforce (face-to-face); diversion (*against the wind*); removal of restraint (control, there is nothing blocking; e.g., *a door is opened*); enablement (there is an access in order to do an activity; e.g., *pick up*); attraction (*vacuum, magnet*); resistance; link (*family, snaps of coat*).

- Unity/iteration/multiplicity: merging (join or combine with); collection (grouping); splitting (divide or separate); iteration (repetition).

- Identity (Evans, 2007)/transformation (Lakoff, 1987): part-whole; count-mass; matching; superimposition (the size increases and decreases); a path to end focus (destination); multiplex to mass (*cattle* and *cows*, a single mass and groups); following a trajectory (evolution or trajectory); reflexive (a part of the entity is TR and another part is LM, use of prepositions *out/over*; e.g., *the syrup spread out*; *roll the log over*); rotation (blocks access of vision, continuous vision).

- Existence: removal (absence); bounded space (having limits); object (entity).

4. Concerning dimensions of construal, the following parameters from the principles of construal (Langacker, 2008) (see section 4.1) are analysed. I consider the vantage point (the viewpoint) as the most relevant in this analysis:

- Vantage point: a position and a viewpoint of the speaker and the hearer. For example, objectivity or subjectivity; speaker (the speaker is *he, she or they*); speaker and hearer (the speaker focuses on the hearer *you*); TR (the speaker and TR are *I* or *we*) or LM (the speaker and LM are *I* or *we*).
- Perspective, viewing arrangement (relation between viewers and the scene).
- Perceptual asymmetry.
- Degrees (*I, you, we*).
- Ground (*now, here, I, you*), place and time.
- Temporal dimension, dynamicity.
- Scanning, reference point.

4.1 In the fourth aspect of dimensions of construal, I also consider the following **dimensions of imaginery** (Langacker, 1991):

- Profile.
- Level of specificity.
- Scale and scope.
- Salience.
- Construal of a situation.
- Perspective (orientation, vantage point).

The results of this analysis of prepositions are displayed in tables to show different categories of parameters and their values, their frequencies in prepositional uses in the corpus, the contrastive differences of the three dimensions of topology, dynamics and function, the frames of reference and the animacy of entities. Thus, the tables show the frequencies for the animacy of entities (TR), the frames of reference, the dimensions and the relative size of TR-LM for each preposition.

From the *Oxford Dictionary of Current Idiomatic English* (Cowie, Mackin & McCaig, 1985), I include below the sets of idiomatic expressions not analysed in this study (see table 18, table 19, table 20, table 21 and table 22).

Table 18. Idiomatic expressions with the preposition *at* (Cowie, Mackin & McCaig, 1985):

At all	At all costs	At all events	At all times
At all hours (of the day/night)	At any moment	At any price	At any rate
At sb's behest	At best/worst	At the best of times	At sb's bidding
At a/one blow	At bottom	At close quarters	At close range
At cross purposes	At one's (own) direction	At the double	At the drop of a hat

At the chalk face	At the coalface	At the double	At your fingertips
At one's ease	At one's elbow	At the eleventh hour	At every turn
At one's (own)/sb's expense	At the expense of sb/sth	At (its/one's) face value	At first
At the first attempt	At first blush	At first glance	At first light
At first sight	At the foot of one's/the bed	At full speed	At a glance
At a (rough/wild) guess	At sb's hands	At heart	At sb's heels
At home (not abroad)	At large	At last	At the last
At the last time	At least	At one's leisure	At length
At long last	At long/short range	At a loss	At the moment
At a low ebb	At the moment/time of speaking	At the moment's notice	At a moment's two hours'/three weeks' notice
At (the) most	At once	At one's sitting	At one remove (from sb/sth)
At one (fell) swoop	At one (o'clock) sharp	At one and the same time	At one time or another
At the outset (of sth)	At the outside	At one's own risk	At one's peril
At a pinch	At present	At a price	At the prospect
At random	At risk	At the risk of doing sth	At a run
At the same time	At second hand	At short notice	Be all at the sea
At sight	At (the) sight of sb/sth	At a snail's pace	At sb's suggestions

At a tender age	At that	At a pinch	At a price
At a push	At this rate	At this stage (of sth)	At the (very) thought of (doing) sth/that
At times	At a time like this/that	At the top of one's voice	At top speed
At (a) walking pace	At what (a) cost/price	At will	Be at the mercy of sth/sb
Be/at behind the wheel			

Table 19. Idiomatic expressions with the preposition *beside* (Cowie, Mackin & McCaig, 1985):

Be beside the point	Be beside yourself	Be beside the mark

Table 20. Idiomatic expressions with the preposition *by* (Cowie, Mackin & McCaig, 1985):

By accident	By/from all accounts	By all means	By any chance
By anybody's/sb's standards	By and by	By chance	By common consent
By/in comparison	By courtesy of sb	By definition	By design
By dint of sth	By the dozen	By fair means or foul	By far the best/the best by far
By the fire(side)	By/in fits and starts	By guess and by God	By hand
By hook or by crook	By the hour	By intent	By itself/oneself
By and large	By/in leaps and bounds	By the light of sth	By/from the look of sb/sth
By means of sth	By mistake	By a mile/by miles	By no means

By a nose	By reason of sth	By return	By right of sth
By rights	By the same token	By the scruff of one's/the neck	By the skin of one's teeth
By some fortunate/chance/ Coincidence	By then	By this/that time	By the time
By trial and error	By turns	By virtue of sth	By the way
By word of mouth	Bygone days/days gone by	By a whisker	Without so much as by-your-leave
Bit by bit	By all odds		

Table 21. Idiomatic expressions with the preposition *near* (Cowie, Mackin & McCaig, 1985):

A near miss	Be near the bone	Be near the knuckle	Be near the mark
Close/near at hand	So near and yet so far	Near and dear (to sb)	A near miss
Near/close to bone/knuckle	One's nearest and dearest	The nearest offer	Come near to (doing) sth

Table 22. Idiomatic expressions with the preposition *next to* (Cowie, Mackin & McCaig, 1985):

Next to nothing	In next to no time	Stand next to	Right next to

6.3 The definitions of sense parameters

With regard to spatial relations between a TR and an LM, I include below my proposal of definitions associated with the parameters and their values used in my analysis.

TOPOLOGY:

REFERENCE POINT: A fixed place or an element in space (LM) is used to help the speaker and hearer localise the TR in the broader space. It does not specify whether there is an exact coincidence of the TR and the LM in the same space.

COINCIDENCE: The TR and the LM occupy the same space.

CONTACT: The TR and the LM touch each other.

CONTIGUITY: The TR and the LM are close to each other without contact, or contact is not specified.

PROXIMITY: The TR and the LM are near each other in space or order.

SEPARATION OR DISTANCE: The TR and the LM are apart or distant in space.

DYNAMICS:

FRONTAL ORIENTATION: The frontal position of the TR in relation to the LM (regarding points on the compass or a specific place or object).

BACKWARD ORIENTATION: The back of the TR faces the LM.

SIDEWAYS/LATERAL ORIENTATION: The side of the TR faces the LM.

FRONTAL ORIENTATION: The frontal position of the LM in relation to the TR (regarding points on the compass or a specific place or object).

BACKWARD ORIENTATION: The back of the LM faces the TR.

SIDEWAYS/LATERAL ORIENTATION: The side of the LM faces the TR.

MOTION (MOVEMENT):

The TR and the LM move towards each other.

The TR moves towards the LM.

The LM moves towards the TR.

The TR moves away from the LM.

PRESSURE: The TR exerts a force on the LM and is in contact with the LM.

SEQUENCE: The TR and the LM are located in an ordered sequence. Also, a series of related scenes or shots may appear in a location (LM).

BALANCE: The TR is in equilibrium with the LM and therefore remains balanced without losing control or motion in terms of weight, number or amount.

RELATIVE ORIENTATION (UNDETERMINED): The orientation of the TR is not determined or specified in relation to the LM.

FUNCTION:

CONTROL: The TR checks, regulates or dominates the LM. The LM checks, regulates or dominates the TR.

PURPOSE: The TR interacts with the LM because it has a desired intention and a goal.

SUPPORT: The TR or the LM extends help to the other participant, which means when the TR - or the LM -sustains weight or pressure.

LINK: The TR and the LM are connected physically.

CONCEALMENT: The animate TR is in the act of hiding in a place out of sight of the LM. The TR and the LM (animate or inanimate) are not visible simultaneously.

COMPANY: The TR is in a state of being with another person or animal (the LM). Both the TR and the LM are people or animals.

INTERACTION: The TR is in the act of talking or doing activities with the LM. Both the TR and the LM act in a reciprocal procedure. In the case of *next to*, a sequential organisation suggests a TR and an LM placed in a sequence.

OPERATION/MANAGEMENT: The TR is in the act of talking or doing activities with the LM. The TR and the LM do not act in a reciprocal procedure.

ACCESSIBILITY: The animate TR can enter, use, or obtain the LM.

REALISATION (for the use of *by*): An activity or a process is realised by an animate landmark in passive sentences.

INSTRUMENT (means of transport or tool, for the use of *by*): A landmark expresses an instrument, which may include a means of transport or travelling.

ALLIANCE (SYNERGY) for the use of *beside*: A TR and an LM have a common interest and a reciprocal effect. There is a cooperative action between a TR and an LM.

INTENTIONALITY:

NO MUTUAL ATTENTION: Neither TR nor LM is doing the activity with, listening to or watching the other. The TR's attention to the LM. The LM's attention to the TR.

MUTUAL ATTENTION: The TR is in the act of doing an activity with, listening to or watching the LM and vice versa.

ACTIVE TRAJECTOR: The TR does activities involving physical movement and energy expending.

ACTIVE LANDMARK: The LM does activities involving physical movement and energy expending.

PASSIVE TRAJECTOR: The TR does not do activities involving physical movement and energy expending.

PASSIVE LANDMARK: The LM does not do activities involving physical movement and energy expending.

THE POSITION OF THE TRAJECTOR AND THE LANDMARK:

SYMMETRY: The TR and the LM form two sides positioned in the same way or are very similar in size, shape or position.

ASYMMETRY: The TR and the LM do not have two sides positioned in the same way or are not similar in size, shape, or position, so there is a lack of symmetry.

THE ANIMACY OF THE TRAJECTOR AND THE LANDMARK:

ANIMATE TRAJECTOR: The TR (people, animals, plants, rivers or festivities) is alive, or when someone controls machines, these have the potential for movement with the expenditure of energy.

ANIMATE LANDMARK: The LM (people, animals, plants, rivers or festivities) is alive, or when someone controls machines, these have the potential for movement with the expenditure of energy.

Some descriptions of animacy:

- People and animals are alive.
- Plants and flowers are alive because they are growing and not dead.
- A flowing river has energy. The river is alive with fish, meaning many fish live in the river.
- A festivity is an event that describes people's behaviour about each other, perhaps engaging with animals, playing music or dancing. Accordingly, one can write, for example, *the festivities were alive with every form of entertainment*.

INANIMATE TRAJECTOR: The TR (objects, materials, artefacts or machines without a human controller) is not alive and has no potential for movement, and therefore there is no motion.

INANIMATE LANDMARK: The LM (objects, materials, artefacts or machines without a human controller) is not alive and has no potential for movement, and therefore there is no motion.

Chapter 7: Results and analysis: *At, beside, by, near* and *next to*

After an overview of the materials and the procedure proposed for the semantic contrast of the prepositions above, the main findings and results are discussed in this chapter. The tables and the detailed exemplification of these prepositions show the results of my study. Analysing the sentences in their context is, in my view, fundamental to the description of space and the perception of parameters and values.

According to Morley (2014: 36), the process of being critical does not mean an agreement with the information read but involves looking for reasons why those ideas usually accepted as plausible should not necessarily be accepted, also identifying problems using methods or arguments. In that case, this should be constructive criticism as to how this research might be improved. With these points in mind, the hypothesis or statement expounded below suggests and improves new aspects of research in the field of Linguistics.

Navarro i Ferrando (2006b) presents the function of the TR as the most prominent dimension of meaning for the preposition *at* in many contexts. When analysing the context, it is necessary to decide each preposition's predominant or most salient dimensions. In the process of comprehending a context, one preposition may highlight a topological dimension (e.g., contact, proximity) or a dynamic dimension (e.g., orientation, motion), whereas using another preposition may highlight a functional dimension (e.g., operation, control) in a similar specific context. Two different prepositions may also highlight different functional dimensions in the same location, whereas the topological relation between TR and LM are identical. The functional dimension concerns an operation and an intention (e.g., studying, working, buying, etc.), being these functions expressed by the preposition *at*, for example. In this case, the TR is carrying out an operation concerning the LM as a setting.

In some cases, in deciding on using a preposition, there is an option in which the topological relation may often present two equally valid prepositions in a situation of construal, and this topological relation does not offer the clue to decide on using one preposition over another. In contrast, in the functional relation of the location, one can choose a particular preposition in a context where other prepositions convey different meanings. Here some questions may arise about function: are functional patterns provided by topological or dynamic patterns? Are functional patterns understood independently from mere spatial conception?

Coventry et al. (2004) understand the functional patterns independently by experiential conception. Regarding spatial locations, the context does not give a concrete semantic meaning for a precise interpretation of the construal on many occasions. In contrast, the function of the TR or the functional experience may determine the semantic meaning for having this specific meaning allotted to it. Consequently, the interpretation of functional relations also presents the semantic motivation for selecting a particular preposition over another.

The term context highlights the TR, the verb, a special focus on the preposition and the LM, including the setting, the sequences of the scenes and the general understanding of the text itself. The interpretation of the text and the TR-LM function are two aspects that count in understanding the context. Therefore, I follow the practice of analysing the context to understand the most prominent dimension (topology, dynamics or function).

7.1 The case of *at*

This section introduces the semantic parameters used for determining the meaning and their predominant values. These prevailing values do not exclude or limit other possible values to occur in usage. These results show the predominant spatial configuration of the entities so that the data depicts the range of frequencies of the values occurring for each parameter. Table 23 shows the frequency of the dimensions and their values in the sample regarding preposition contexts. The table shows the frequencies of occurrence of the dimensions of topology, dynamics and function for 1,000 examples, after analysing the relation of the TR to the LM in context (see section 4.2, 4.3 and 4.4):

Table 23: The semantic dimensions of *at*

AT: THE DIMENSION OF TOPOLOGY	
Semantic value	**Number of tokens**
REFERENCE POINT	60
COINCIDENCE	110
CONTIGUITY	4
PROXIMITY	29
TOTAL	203
THE DIMENSION OF DYNAMICS	
Semantic value	**Number of tokens**
FRONTAL ORIENTATION	67
MOTION (MOVEMENT FORWARDS)	164
TOTAL	231
THE DIMENSION OF FUNCTION	
Semantic value	**Number of tokens**
CONTROL	127
PURPOSE	15
SUPPORT	23
COMPANY	39
OPERATION/MANAGEMENT	188
ACCESSIBILITY	174
TOTAL	566
TOTAL CORPUS	1,000

The table indicates that out of the 1,000 instances in the sample, in 203, the relation between TR and LM showed a prominent topological pattern, and dynamics and function patterns were less relevant for interpretation. The predominant pattern was that the TR and the LM coincide in space (coincidence). In 60 instances, the topological relation conveyed the role of the LM as a reference point (60 instances). Proximity (29) and contiguity (4) were considerably less frequent. Out of the 1,000 examples, 231 showed a prominent dynamic relation between TR and LM, being topology or function less relevant for interpretation. From these, in 164 instances, the TR moved forwards towards the LM, and in 67 occasions, there was only forward orientation without actual motion. Finally, 566 instances showed a predominance of a functional pattern over topological or dynamic ones. In 188 occurrences, the functional pattern was operation/management, where the TR was intentionally addressing the LM for manipulation or action in a canonical way. In 174 instances, the TR-LM relation in the scene expressed accessibility. The TR exerted extensively control over the LM in 127 examples. Other functional relations, like purpose (15), support (23) or company (39), were also interpreted in some scenes.

In the following examples of the prepositions *at, beside, by, near,* and *next to,* I indicate a list of characteristics in the following order:

- According to the tables above, the predominant parameter of dimension and its predominant value in the corpus.
- One, two or three sentences with the suitable preposition (*at, beside, by, near or next to)* from the corpus.
- The reference to newspapers or fiction genre from the BNC corpus, in italics.
- The same enumeration from my analysis of the appropriate prepositions between brackets.
- The analysis of each sentence with the predominant parameters and values.

1.1. Topology: Reference point

[1.1] Animal rights campaigner Vicki Moore was so upset by cruelty to cows and bulls during the festivities **at** Candelada near Avila, Spain, that she wrote to the Prime Minister about it. (*BNC. The Daily Mirror. London. Mirror Group Newspapers, 1992)*. (*At-364).*

Dimension: <u>topology</u>, reference point, to localise the festivities in a concrete space.
Frame of reference: absolute (fixed place).
Schema: centre-periphery.
No mutual attention: TR-the festivities, animate. LM- Candelada, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

1.2. Topology: Coincidence

[1.2] A farm worker looks on astonished as a jet pilot shoots out of his cockpit **at** 300 feet. (*BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-612).

Dimension: topology, coincidence; the trajector (cockpit) and the landmark (a point of 300 feet high) occupy the same space.
The landmark is on a point, 300 feet above the ground.
Frame of reference: absolute (altitude and sea level).
Schema: centre-periphery.
TR- his cockpit (with the pilot), animate. LM- 300 feet, inanimate.
There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

1.3. Topology: Contiguity

[1.3] The colour yellow is a mystical experience shared by everybody " -- demolish.
Ros: (**at** edge of stage) it must have been thunder. (BNC. *Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-48).

Dimension: topology, contiguity, at edge of stage.
The trajector and the landmark are close to each other without contact.
Frame of reference: intrinsic (the frontal part of the edge).
Schema: centre-periphery.
TR- Ros, animate. LM- the edge of the stage, inanimate.
There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

1.4. Topology: Proximity

[1.4] Miniature bulbs, such as Dwarf Narcissi, give enormous pleasure. They are bright and enchanting and look superb in a rock garden, **at** the front of a border or in pots. Best of all, they are easy to grow. Now you can buy a collection of Dwarf Narcissi -- 60 bulbs -- in four varieties. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-182).

Dimension: topology, proximity of flowers (Narcissi).
Frame of reference: intrinsic (the frontal part of the border).
Schema: containment. TR- flowers, animate. LM- the front, inanimate.
There may be something in between.

Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry. Vantage point: speaker.

1.5. Dynamics: Frontal orientation

[1.5] Ros, during this whole business, never quite breaks into articulate speech. His face and his hands indicate his incredulity. He stands gazing **at** the middle barrel. (BCN. *Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).*(At- 96).

Dimension: dynamics, orientation, he is oriented at the middle barrel.
The frontal position of the face (trajector) is in relation to the landmark.
The barrel does not have a frontal part.
Frame of reference: intrinsic (facing the middle barrel).
Schema: Path (from-to).
TR- he, animate. LM-the middle barrel, inanimate. Horizontal axis.
Motion. Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

1.6. Dynamics: Movement and orientation

[1.6] Our teen, a boy of 13, is a fan of the new laser shooting game Quasar, and he soon had the Butlin's version in his sights. Then he had a blast **at** some clay-pigeons, again laser-style. You pay for these on-site extras, but most of the fun is free. (BNC. *The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-395).

Blast- an explosion. Clay-pigeon- disk used as shooting target.
Dimension: dynamics, movement and orientation (to shoot).
A boy of 13 years old using the gun is oriented and pointed at the landmark.
The movement is from the boy who had a blast to some clay pigeons.
There is an intention to arrive at the destination of the landmark.
Frame of reference: intrinsic (the frontal part of the gun).
Schema: compulsion (obligation, force, pressure). Horizontal axis. Motion.
TR- blast, animate. LM- clay-pigeons, inanimate.
Unequal relative size: TR>LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker.

1.7. Function: Control

[1.7] **At** his two shops in Reigate, Surrey, and Beckenham, Kent, he has had to replace full-time staff with part-timers. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At- 146).

Dimension: function, control of shops; there is control because he has had to replace staff. Frame of reference: relative (to replace staff).
Trajector interacts at the landmark, at his two shops.
There is not an absolute or an intrinsic frame of reference.
Schema: enablement.
There is no mutual attention: TR-he has had to replace full-time staff with part-timers, animate. LM- his two shops, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

1.8. Function: Purpose

[1.8] Why do you ask? What are you driving **at**? What's your name? *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At- 72).

Dimension: function, purpose, you are driving at (complement-what).
Frame of reference: relative (The speaker has a purpose).
Schema: enablement.
No mutual attention: TR-you, animate. LM- what (the purpose), inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker.

1.9. Function: Support

[1.9] I grabbed the handrail **at** the edge of the cable car.
(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992). (At-572).

Dimension: function, support. There is a support on the handrail (support rail on a cabin), and a person is in the act to take hold of this handrail.
Frame of reference: intrinsic.
Schema: enablement.
No mutual attention: TR- the handrail, inanimate. LM- the edge of the cable car (a cabin in a mountain area), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM passive.
Vantage point: speaker (I) and trajector are not the same.

1.10. Function: Company

[1.10] [...] Wyatt was a special guest of Fergie **at** the Buckingham Palace ball to celebrate the birthday of the Queen Mother. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-300).

Dimension: function, company.
The guests are in company with other guests to celebrate the birthday of the Queen Mother. Frame of reference: relative.
Schema: enablement for guests.
Mutual attention: TR-the special guest Wyatt, animate. LM- the Buckingham palace ball (people involved), animate. Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active. Vantage point: speaker.

1.11. Function: Operation/management

[1.11] Because it might not be the compassionate, caring Dr Cox who is **at** our bedside. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At- 440).

Dimension: function, operation/management.
Frame of reference: Intrinsic (the lateral side of the bed).
Schema: centre-periphery.
No mutual attention: TR- Dr Cox, animate. LM- our bedside, inanimate.
There may be something in between. Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (we) and landmark (our bedside).

1.12. Function: Accessibility

[1.12] **At** the pyramids, if you shop around, you should get a good half-hour camel trek into the desert for as little as 1. (BNC. *The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At- 259).

Dimension: function, accessibility, there is access to go to the Pyramids for tourists.
Frame of reference: absolute (a fixed construction).
Schema: centre-periphery.
No mutual attention: TR- you, animate.
LM- the Pyramids, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

Within the dimension of function, table 24 indicates the intentionality from the TR to the LM and the most dynamic and intentional entity for the 566 examples:

Table 24: The intentionality of *at* (function)

AT: INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	403
MUTUAL ATTENTION	163
TOTAL	566
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	476
PASSIVE TRAJECTOR	90
TOTAL	566
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	244
PASSIVE LANDMARK	322
TOTAL	566

The table indicates that out of the 566 instances of the intentionality within the functional parameter in the sample, in 403, the relation between TR and LM showed no mutual attention and in 163 showed mutual attention. In 476 instances, the TR was active, and in 90 instances, the TR was passive. In 244 instances, the LM was active, and in 322, the LM was passive.

1.13. Intentionality (function): No mutual attention, active trajector and passive landmark.

[1.13] If you tell me of Sarah's or Rachel's or Rebecca's nursing their children I can answer that the one drew water **at** a well for her father's flocks, another baked cakes on a hearth, and another dressed savoury meat for her husband. (BNC. *Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (At-25).

Dimension: function, operation/management, to extract water for a group of animals (sheep). Frame of reference: intrinsic.
Schema: compulsion (force, compulsion, pressure).
No mutual attention: TR- the lady drew water, animate. LM- a well, inanimate.

Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

1.14. Intentionality (function): Mutual attention, active trajector and active landmark.

[1.14] [...] Wyatt was a special guest of Fergie **at** the Buckingham Palace ball to celebrate the birthday of the Queen Mother. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-300).

Dimension: function, company.
The guests are in company with other guests to celebrate the birthday of the Queen Mother.
Frame of reference: relative.
Schema: enablement for guests.
Mutual attention: TR-the special guest Wyatt, animate. LM- the Buckingham palace ball (metonymy, an event is associated with an experience. People participate in this event), animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker.

Within the dimension of dynamics, table 25 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 231 examples:

Table 25: The intentionality of *at* (dynamics)

AT: INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	159
MUTUAL ATTENTION	72
TOTAL	231
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	195
PASSIVE TRAJECTOR	36
TOTAL	231
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**

ACTIVE LANDMARK	85
PASSIVE LANDMARK	146
TOTAL	231

Table 25 indicates that out of the 231 instances of the intentionality within the dynamical parameter in the sample, in 159, the relation between TR and LM showed no mutual attention and in 72 showed mutual attention. In 195 instances, the TR was active, and in 36 instances, the TR was passive. In 85 instances, the LM was active, and in 146, the LM was passive.

1.15. Intentionality (dynamics): No mutual attention, active trajector and passive landmark.

[1.15] I had thought you should have sat **at** table with me. He sits **at** the table.
(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77). (At-10 and 11).

Dimension: dynamics, frontal orientation, there is not a movement.
Frame of reference: intrinsic.
Schema: centre-periphery. Horizontal axis. No motion.
TR- you/he, animate. LM- table, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker.

1.16. Intentionality (dynamics): Mutual attention, active trajector and active landmark.

[1.16] Ros: (Peevish) Never a moment's peace! In and out, on and off, they're coming **at** us from all sides. *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-82).

Dimension: dynamics, movement.
Frame of reference: relative.
Schema: from-to. Horizontal axis. Motion.
TR- they, animate. LM- us (we are active and seeing their movement to us), animate.
Equal relative size: TR=LM. TR and LM are not in the same position, asymmetry.
Mutual attention: TR active and LM active.Vantage point: speaker.

In table 26, there is a classification of the three frames of reference from the TR to the LM for a total of 1,000 examples:

Table 26: The three frames of reference (*at*)

AT: FRAME OF REFERENCE	
Semantic value	**Number of tokens**
RELATIVE	338
INTRINSIC	653
ABSOLUTE	9
TOTAL	1,000

The table indicates that out of the 1,000 instances of frames of reference in the sample, there was a relative frame in 338 occurrences, there was an intrinsic frame in 653 occurrences, and in 9 occurrences, there was an absolute frame. A predominant value of an intrinsic frame between the TR and the LM is observed.

1.17. Frame of reference: Relative

[1.17] **At** his two shops in Reigate, Surrey, and Beckenham, Kent, he has had to replace full-time staff with part-timers. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At- 146).

Dimension: function, control of shops.
There is control because he has had to replace staff.
Frame of reference: relative (to replace staff. Trajector interacts at the landmark, at his two shops. There is no absolute or an intrinsic frame of reference).
Schema: enablement.
There is no mutual attention: TR-he (who has had to replace full-time staff with part-timers), animate. LM- his two shops, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

1.18. Frame of reference: Intrinsic

[1.18] The colour yellow is a mystical experience shared by everybody " -- demolish.
ROS: (**At** edge of stage). (BNC. *Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-48).

Dimension: topology, contiguity, at edge of stage.
The trajector and the landmark are close to each other without contact.
Frame of reference: intrinsic (the frontal part of the edge).
Schema: centre-periphery.
TR- Ros, animate. LM- the edge of the stage, inanimate.

There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

1.19. Frame of reference: Absolute

[1.19] Animal rights campaigner Vicki Moore was so upset by cruelty to cows and bulls during the festivities **at** Candelada near Avila, Spain, that she wrote to the Prime Minister about it. (*BNC. The Daily Mirror. London. Mirror Group Newspapers, 1992)*. (*At-364)*.

Dimension: topology, reference point, to localise the festivities in a concrete space.
Frame of reference: absolute (fixed place).
Schema: centre-periphery.
No mutual attention: TR-the festivities, animate. LM- Candelada, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

In table 27 below, there is a classification of the relative position from the TR to the LM and vice versa for a total of 1,000 examples. Some examples are not explicit since there is no contextual information to indicate the relative position of the participants in the context (if these examples came from images or videos, the position would be precise):

Table 27: The relative position of *at*

AT: RELATIVE POSITION	
Semantic value	**Number of tokens**
SYMMETRY	90
ASYMMETRY	760
NOT EXPLICIT	150
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative position in the sample, in 90 occurrences, there was a symmetrical position between the TR and the LM, in 760 occurrences, there was an asymmetrical position, and in 150 occurrences, there was not explicit. An asymmetrical value is predominant.

1.20. The position: Asymmetry

[1.20] Miniature bulbs, such as Dwarf Narcissi, give enormous pleasure. They (flowers) are bright and enchanting and look superb in a rock garden, **at** the front of a border or in pots. Best of all, they are easy to grow. Now you can buy a collection of Dwarf Narcissi -- 60 bulbs -- in four varieties. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-182).

Dimension: topology, proximity of flowers (Narcissi).
Frame of reference: intrinsic (the frontal part of the border).
Schema: containment. TR- flowers, animate. LM- the front, inanimate.
There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry (there is no mutual intentionality).
Vantage point: speaker.

1.21. The position: Symmetry

[1.21] (They smile **at** each other). We mustn't drop off like that again. (Pause. ROS takes the letter gently from him.) ROS: Now that we have found it, why were we looking for it? *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-94).

Dimension: dynamics, frontal orientation, they smile at each other.
Frame of reference: relative.
Schema: centre-periphery. TR-they, animate. LM-at each other (they), animate. Horizontal axis. Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Mutual attention: TR active and LM active.
Vantage point: speaker.

In table 28, the animacy of the TR is, in each case, indicated for a total of 1,000 examples:

Table 28: The animacy of the trajector (*at*)

AT: THE ANIMACY OF THE TRAJECTOR	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR	816
INANIMATE TRAJECTOR	184
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR in the sample, in 816 occurrences, there was an animate TR. In 184 occurrences, there was an inanimate TR.

In table 29, the animacy of the LM is, in each case, indicated for a total of 1,000 examples:

Table 29: The animacy of the landmark (*at*)

AT: THE ANIMACY OF THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE LANDMARK	292
INANIMATE LANDMARK	708
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the LM in the sample, in 292 occurrences, there was an animate LM. In 708 occurrences, there was an inanimate LM.

In table 30, the animacy of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 30: The animacy of the trajector and the landmark (*at*)

AT: THE ANIMACY OF THE TRAJECTOR AND THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR AND ANIMATE LANDMARK	265
ANIMATE TRAJECTOR AND INANIMATE LANDMARK	551
INANIMATE TRAJECTOR AND INANIMATE LANDMARK	157
INANIMATE TRAJECTOR AND ANIMATE LANDMARK	27
TOTAL	1,000

The table indicates that out of the 1,000 instances in the sample, 265 instances showed an animate TR and LM, 551 instances showed an animate TR and an inanimate LM, 157 instances showed an inanimate TR and LM. Finally, 27 instances showed an inanimate TR and animate LM. Thus, the predominant value is animate TR and an inanimate LM.

1.22. The animacy: Animate trajector and inanimate landmark.

[1.22] He sits **at** the table. Fill me a glass of burgundy. Pamela fills his glass and stands beside him. (*BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77*). (At-11).

Dimension: dynamics, frontal orientation.
Frame of reference: intrinsic (the frontal part of the table).
Schema: centre-periphery. Horizontal axis.
No motion. TR- he, animate. LM- the table, inanimate.
Unequal relative size: TR<LM.
TR and LM are in the same position (the frontal position), symmetry.
Vantage point: trajector and speaker are not the same.

1.23. The animacy: Animate trajector and animate landmark.

[1.23] Belville: I have done. Nor did I meet you here to be angry with you, I hope I have not so offended you that you refuse to officiate and give us your instructions here tomorrow. He glances **at** Pamela. *(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (At-19).

Dimension: dynamics, frontal orientation, glance, look at.
Frame of reference: relative.
Schema: centre-periphery. Horizontal axis.
TR- he, animate. LM- Pamela, animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
Mutual attention: TR active and LM active. Vantage point: speaker.

1.24. The animacy: Inanimate trajector and inanimate landmark.

[1.24] I extract significance from melodrama, a significance which it does not in fact contain; but occasionally, from out of this matter, there escapes a thin beam of light that, seen **at** the right angle. *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-90).

Dimension: topology, coincidence, a light at the right angle.
Frame of reference: intrinsic.
Schema: centre-periphery.
TR- a beam of light, inanimate. LM-the right angle, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

1.25. The animacy: Inanimate trajector and animate landmark.

[1.25] Cheques have to arrive **at** the registrars by Thursday 10 September, so post them by next Tuesday. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-120).

Dimension: dynamics, movement.
Frame of reference: intrinsic.
Schema: from-to. Horizontal axis. Motion.
TR- cheques, inanimate. LM- the registrars (administrative), animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR passive and LM passive.
Vantage point: speaker.
Prepositional verb: arrive at (this verb requires the preposition *at*). In this case, I analyse the preposition only.

In table 31, the relative size of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 31: The relative size of *at*

AT: RELATIVE SIZE	
Semantic value	**Number of tokens**
TR=LM	77
TR>LM	77
TR<LM	846
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative size for the TR and the LM in the sample, 77 instances showed an equal size for the TR and the LM (TR=LM), 77 instances showed the bigger TR than the LM (TR>LM), and 846 instances showed a smaller TR than the LM (TR<LM). Thus, the predominant and most frequent value is, in this case, TR<LM.

1.26. The relative size of the trajector: TR<LM

[1.26] [...] Wyatt was a special guest of Fergie **at** the Buckingham Palace ball to celebrate the birthday of the Queen Mother. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-300).

Dimension: function, company.

The guests are in company with other guests to celebrate the birthday of the Queen Mother. Frame of reference: relative.
Schema: enablement for guests.
Mutual attention: TR-the special guest Wyatt, animate.
LM- the Buckingham palace ball, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active. Vantage point: speaker.

1.27. The relative size of the trajector: TR>LM

[1.27] [...] And tosses a single coin on the ground between them. The player spits **at** the coin, from where he stands [...]. (*BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-55).

Dimension: function, operation/management to throw up/expel saliva while talking.
Frame of reference: intrinsic.
Schema: from-to.
No mutual attention: TR-the player, animate.
LM- the coin, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

1.28. The relative size of the trajector: TR=LM

[1.28] Ros and Guil have frozen. Guil unfreezes first. He jumps **at** Ros. *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-58).

Dimension: dynamics, movement.
Frame of reference: relative.
Schema: from-to. Horizontal axis. Motion.
TR- he, animate. LM- Ros, animate.
Equal relative size: TR=LM. TR and LM are not in the same position, asymmetry.
Mutual attention: TR active and LM active.Vantage point: trajector.

Table 32 shows the image schemas of the TR and the LM for a total of 1,000 examples (see section 4.5):

Table 32: The image schemas of *at*

AT: IMAGE SCHEMAS	
Semantic value	**Number of tokens**
TOPOLOGY SCHEMA: CENTRE-PERIPHERY	120
TOPOLOGY SCHEMA: CONTAINMENT	150
TOPOLOGY SCHEMA: SCALE	14
SPATIAL SCHEMA: PATH (SOURCE-PATH-GOAL/FROM-TO)	244
FORCE SCHEMA: COMPULSION (OBLIGATION, FORCE, PRESSURE)	75
FORCE SCHEMA: ENABLEMENT	386
FORCE SCHEMA: BLOCKAGE	6
FORCE SCHEMA: LINK	5
TOTAL	1,000

The table indicates that out of the 1,000 instances of the image schema between the TR and the LM, the topology schema of centre-periphery was interpreted in 120 cases. The topology schema of containment was interpreted in 150 instances, and the topology schema of scale was interpreted in 14 instances. The spatial schema of path was interpreted in 244 instances. The force schema of compulsion (obligation, force, pressure) was diagnosed in 75 instances, the force schema of enablement was interpreted in 386 instances, and other instances of force schema, such as blockage (6) and link (5), appeared in some scenes. Thus, the results show a predominant value of the force schema (enablement refers to access to the LM to do an activity).

1.29. Image schema: Topology schema (centre-periphery)

[1.29] The colour yellow is a mystical experience shared by everybody " -- demolish. ROS: (**At** edge of stage). *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986).* (At-48).

Dimension: topology, contiguity, at edge of stage.
The trajector and the landmark are close to each other without contact. Frame of reference: intrinsic (the frontal part of the edge).
Schema: centre-periphery.
TR- Ros, animate. LM- the edge of the stage, inanimate. There may be something in between. Unequal relative size: TR<LM. TR and LM are not in the same position, asymmetry. Vantage point: speaker.

1.30. Image schema: Topology schema (containment)

[1.30] Rosemoor, the Royal Horticultural Society's garden **at** Torrington, Devon, is a superb example of how beautiful vegetables can be. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-251).

Dimension: topology, coincidence.
Frame of reference: intrinsic.
Schema: containment.
TR- The Royal Horticultural society's garden, inanimate.
LM- Torrington, Devon, inanimate.
Unequal relative size: TR<LM. TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

1.31. Image schema: Topology schema (scale)

[1.31] **At** the top of the tree, the nine women richer than the Queen all inherited their wealth. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-518).

Dimension: topology, reference point.
Frame of reference: intrinsic.
Schema: scale (height, ranking).
No mutual attention: TR-the nine women, animate.
LM- the top of the tree (ranking), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

1.32. Image schema: Spatial schema (source-path-goal/from-to)

[1.32] …she runs off in the opposite direction. Ros and Guil have frozen. Guil unfreezes first. He jumps **at** Ros. *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (At-58).

Dimension: dynamics, movement.
Frame of reference: relative.
Schema: from-to. Horizontal axis. Motion.
TR- he, animate. LM- Ros, animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
Mutual attention: TR active and LM active.Vantage point: trajector.

1.33. Image schema: Force schema, compulsion (force and pressure)

[1.33] Andrew, now 29, was 15 that summer when he knocked **at** the door and introduced himself. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At- 101).

Dimension: function, operation/management, to knock at the door.
Frame of reference: intrinsic.
Schema: compulsion (force and pressure).
No mutual attention: TR-he, animate. LM- the door, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

1.34. Image schema: Force schema (enablement, access to the shops)

[1.34] **At** his two shops in Reigate, Surrey, and Beckenham, Kent, he has had to replace full-time staff with part-timers. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At- 146).

Dimension: function, control of shops (he at this two shops).
There is control because he has had to replace staff.
Frame of reference: relative (to replace staff. Trajector interacts at the landmark, at his two shops. There is no absolute/an intrinsic frame of reference).
Schema: enablement (he has access to his two shops).
There is no mutual attention: TR-he has had to replace full-time staff with part-timers, animate. LM- his two shops, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

1.35. Image schema: Force schema (blockage)

[1.35] Singer Richard Marx was left shaking with fear after being held up **at** gunpoint by Chinese gangsters. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-115).

Dimension: topology, reference point (Richard is pointed by gangsters with a gun).
Frame of reference: intrinsic.
Schema: blockage.
Mutual attention: TR-The singer Richard, animate.
LM- gunpoint by gangsters, animate.
Unequal relative size: TR<LM.

TR and LM are in the same position, symmetry. TR active and LM active.
Vantage point: speaker.

1.36. Image schema: Force schema (link)

[1.36] He has just walked 60 miles to get here. Another child suckles **at** his mother's empty breast. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-232).

Dimension: function, operation/management.
Frame of reference: relative.
Schema: link (family).
Mutual attention: TR-another child, animate. LM- his mother's empty breast, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: speaker.

1.37. The vantage point: Speaker is different from trajector

[1.37] Miniature bulbs, such as Dwarf Narcissi, give enormous pleasure. They are bright and enchanting and look superb in a rock garden, **at** the front of a border or in pots. Best of all, they are easy to grow. Now you can buy a collection of Dwarf Narcissi -- 60 bulbs -- in four varieties. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-182).

Dimension: topology, proximity of flowers (Narcissi).
Frame of reference: intrinsic (the frontal part of the border).
Schema: containment. TR- flowers, animate. LM- the front of a border, inanimate.
There may be something in between.
Unequal relative size: TR<LM. TR and LM are not in the same position, asymmetry.
Vantage point: the speaker is different from the trajector.

1.38. The vantage point: Speaker (I) and trajector (I) are the same

[1.38] Manhattan-based Billy, at No 39 in the charts with All Shook Up, is trying to raise cash to stop the closure of The Bitter End, which featured legends like Bob Dylan and Stevie Wonder.' I played some of my earliest gigs **at** the club,' Joel says. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (At-524).

Dimension: function, operation/management.
Frame of reference: intrinsic.
Schema: enablement.

There is no mutual attention: TR- (I) my earliest gigs, animate. LM- the club, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker (I) and trajector (I) are the same.

7.2 The case of *beside*

In this section, the semantic parameters analysed and their predominant values for *beside* are presented. Table 33 indicates the frequencies of the prominence of the three semantic dimensions (see section 4.2, 4.3 and 4.4) in the spatial relation between TR and LM, for the sample of 1,000 occurrences:

Table 33: The semantic dimensions of *beside*

BESIDE: THE DIMENSION OF TOPOLOGY	
Semantic value	**Number of tokens**
CONTIGUITY (TO A SIDE OF LM)	27
PROXIMITY (TO A SIDE OF LM)	260
TOTAL	287
BESIDE:THE DIMENSION OF DYNAMICS	
Semantic value	**Number of tokens**
LATERAL ORIENTATION OF LM	163
MOTION (MOVEMENT ALONG THE LATERAL SIDE OF LM)	325
TOTAL	488
BESIDE:THE DIMENSION OF FUNCTION	
Semantic value	**Number of tokens**
CONTROL	23
ALLIANCE (SYNERGY)	167
ACCESSIBILITY	35
TOTAL	225
TOTAL CORPUS	1,000

The table indicates that out of the 1,000 instances in the sample, in 287, the relation between TR and LM showed a prominent topological pattern, and dynamics and function were less relevant for interpretation. The predominant pattern was that the TR and the LM are in proximity to a side of the LM in 260 instances. In 27 instances, the topological relation conveyed the contiguity (an adjoining position) to a side of the LM. 488 showed a prominent dynamic relation between the TR and the LM, being topology

or function less relevant for interpretation. From these, in 163 instances, the TR is oriented to a lateral orientation of the LM without actual motion. On 325 occasions, there was a movement along the lateral side of the LM. Finally, 225 instances showed a predominance of a functional pattern over topological or dynamic ones. In 23 occurrences, the TR exerted extensively control over the LM. In 35 instances, the TR-LM relation was interpreted as accessibility. In 167 instances, the TR-LM relation was analysed as alliance (synergy) where a common interest was allied.

One representative example of the preposition *beside* for each semantic parameter and their values is presented below:

2.1. Topology: Contiguity (to a side of LM)

[2.1] The door was solid as rock. On the wall **beside** the door there was a row of three electric switches. *(BNC. Longshot. Francis, Dick. London: Michael Joseph Ltd, 1990).* (Beside-915).

Dimension: topology, contiguity (to a side of LM).
Frame of reference: intrinsic.
Schema: centre-periphery.
TR- on the wall (where there was a row of three electric switches), inanimate.
LM- the door, inanimate. There may be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

2.2. Topology: Proximity (to a side of LM)

[2.2] i.e. the old Whitehall Palace in London, which used to stand **beside** the Thames, between the present Houses of Parliament and Charing Cross Bridge. It was there as early as the thirteenth century, parts of it being from time to time rebuilt or embellished. *(BNC. The Dickens index. Burgis, Nina; Slater, Michael; Bentley, Nicolas. Oxford: OUP, 1990, pp. 182-239*). (Beside-132).

Dimension: topology, proximity (to a side of LM).
Frame of reference: intrinsic.
Schema: centre-periphery.
TR- The old Whiteball palace, inanimate.
LM-the Thames, animate.
There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

2.3. Dynamics: Lateral orientation of LM

[2.3] The coach trundled briskly past, browning everyone with dust; the deerhounds checked and growled thunderously at the town dogs until James Flemyng called them loudly to heel. He reined in his horse **beside** Cameron. Mr Cameron --' he began.' Good morning, Mr Flemyng." Good morning. The work goes on again, I see, now that the -- holiday -- is over. *(BNC. King Cameron. Craig, David. Manchester: Carcanet Press, 1991).* (Beside-639).

Dimension: dynamics, lateral orientation of LM, he reined in his horse (he guided and controlled his horse). There is a lateral orientation of LM, and after that, they are in a position of contiguity. Frame of reference: intrinsic (a lateral side).
Schema: path. Horizontal axis. Motion.
TR- he reined in his horse, animate.
LM- Cameron, animate.
Unequal relative size: TR>LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker.
Mutual attention: TR active and LM active.

2.4. Dynamics: Movement along the lateral side of LM

[2.4] As I stood on the walkway, the water level reached above my knees, and I waded along **beside** the wall in the direction of the lower door and the river. *(BNC. Longshot. Francis, Dick. London: Michael Joseph Ltd, 1990).* (Beside- 914).

Dimension: dynamics, movement, to wade (to walk through water). A movement along the lateral side of LM.
Frame of reference: intrinsic (a lateral side of LM).
Schema: path. Horizontal axis. Motion.
TR- I, animate. LM- the wall, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker (I) and trajector (I).

2.5. Function: Control

[2.5] Unlike Mr Anderson last week, furthermore, he had some elementary knowledge of how the controls worked, having sat **beside** his pilot. So he took off. *(BNC. Daily Telegraph, 1994).* (Beside-372).

Dimension: function, control. There is a co-pilot who controls a plane and his pilot.
Frame of reference: intrinsic.
Schema: enablement.

Mutual attention: TR- he, animate. LM- his pilot, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: speaker.

2.6. Function: Alliance (synergy)

[2.6] They had gone to the park. Boats were for hire by the hour and they had rowed on the lake. Afterwards they had tea in a wooden caf **beside** the lake. *(BNC. Amongst women. McGahern, J. London: Faber & Faber Ltd, 1990).* (Beside- 682).

Dimension: function, alliance (synergy), they interact beside the lake and the mountain.
There is a common interest (enjoying nature, relaxing and rest).
Frame of reference: intrinsic.
Schema: centre-periphery.
There was no mutual attention: TR- They had tea in a wooden caf, animate.
LM- the lake, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

2.7. Function: Accessibility

[2.7] The guests enjoyed cool drinks on the arched terrace **beside** the gently-lapping pool. They played tennis, wallowed in the whirlpool bath, and went on trips on a 38ft motor yacht. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (Beside- 7).

Dimension: function, accessibility and interaction to this place.
They were guests who had access to the arched terrace.
Frame of reference: intrinsic.
Schema: centre-periphery.
No mutual attention: TR-the guests on the arched terrace, animate.
LM- the gently-lapping pool (lapping-length of the pool), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

Within the dimension of function, table 34 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 225 examples:

Table 34: The intentionality of *beside* (function)

BESIDE: INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	152
MUTUAL ATTENTION	73
TOTAL	225
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	169
PASSIVE TRAJECTOR	56
TOTAL	225
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	104
PASSIVE LANDMARK	121
TOTAL	225

The table indicates that out of the 225 instances of the intentionality within the functional parameter in the sample, in 152, the relation between TR and LM showed no mutual attention and in 73 showed mutual attention. In 169 instances, the TR was active, and in 56 instances, the TR was passive. In 104 instances, the LM was active, and in 121, the LM was passive.

2.8. Intentionality (function): No mutual attention, active trajector and passive landmark

[2.8] It seems quieter than the other machines,' said Robyn.' It's not running at the moment,' Wilcox said, with a pitying look.' What's up?' he demanded, addressing the back of a blue-overall worker who was standing **beside** the machine. *(BNC. Nice work. Lodge, David. London: Secker & Warburg, 1988, pp. 1-105).* (Beside-1,000).

Dimension: function, control, to be beside the machine.
Frame of reference: intrinsic.
Schema: enablement (access to the machine).
No mutual attention: TR- a blue-overall worker (who was standing and controlling), animate. LM- the machine, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

2.9. Intentionality (function): Mutual attention, active trajector and active landmark

[2.9] I was running **beside** the young detective who carried my bag on his shoulder towards the waiting and very late plane. *(BNC. In the palace of serpents. Pow, Tom. Edinburgh: Canongate Press plc, 1992, pp. 28-124).* (Beside- 84).

Dimension: function, accessibility.
Frame of reference: relative.
Schema: path. Horizontal axis. Motion.
TR- I, animate. LM-The young detective who carried my bag, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (I) and trajector (I).
Mutual attention: TR active and LM active.

Within the dimension of dynamics, table 35 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 488 examples:

Table 35: The intentionality of *beside* (dynamics)

BESIDE: INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	227
MUTUAL ATTENTION	261
TOTAL	488
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	425
PASSIVE TRAJECTOR	63
TOTAL	488
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	312
PASSIVE LANDMARK	176
TOTAL	488

The table indicates that out of the 488 instances of the intentionality within the dynamical parameter in the sample, in 227, the relation between TR and LM showed no mutual attention and in 261 showed mutual attention. In 425 instances, the TR was

active, and in 63 instances, the TR was passive. In 312 instances, the LM was active, and in 176, the LM was passive.

2.10. Intentionality (dynamics): No mutual attention, active trajector and passive landmark

[2.10] **Beside** the Cross one of the men had torn a paper into little bits and scattered them, to a groaning catcall from the crowd. *(BNC. King Cameron. Craig, David. Manchester: Carcanet Press, 1991).* (Beside-626).

Dimension: dynamics, movement, one of the men had torn the paper into little bits and scattered them; lateral orientation.
Frame of reference: intrinsic.
Schema: centre-periphery. Horizontal axis. Motion.
TR- one of the men had torn the paper into little bits and scattered them, animate.
LM- the Cross, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.
No mutual attention: TR active and LM passive.

2.11. Intentionality (dynamics): No mutual attention, active trajector and passive landmark

[2.11] They all moved off together down the tawny dust of the road, close **beside** the shingle banks and black deeps of the river. *(BNC. King Cameron. Craig, David. Manchester: Carcanet Press, 1991, pp. 15-113).* (Beside-641).

Dimension: dynamics, movement, to move off beside the shingle banks.
Frame of reference: intrinsic.
Schema: path. Horizontal axis. Motion.
TR- they, animate.
LM- the shingle banks and black deeps of the river, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. No mutual attention: TR active and LM passive.

2.12. Intentionality (dynamics): No mutual attention, passive trajector and active landmark

[2.12] He wiped the inside of the helmet with his anorak sleeve and put the helmet down **beside** him. *(BNC. Jubilee wood. Hassall, Angela. Oxford: OUP, 1989).* (Beside-726).

Dimension: dynamics, movement, wipe (to clean), and put the helmet down.
Lateral orientation.
Frame of reference: intrinsic.
Schema: path. Horizontal axis. Motion.
TR- the helmet, inanimate.
LM- he, animate.
Unequal relative size: TR<LM. TR and LM are not in the same position, asymmetry.
Vantage point: speaker. No mutual attention: TR passive and LM active.

2.13. Intentionality (dynamics): Mutual attention, active trajector and active landmark

[2.13] It doesn't matter if the dog isn't very well trained. It just has to walk downstairs with the Queen on a lead and sit **beside** her. *(BNC. Northern Echo newspaper, 1994).* (Beside- 587).

Dimension: dynamics, movement, the dog has to walk and sit.
Frame of reference: intrinsic.
Schema: path. Horizontal axis. Motion.
TR- the dog, animate. LM- the Queen, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry. Vantage point: speaker.
Mutual attention: TR active and LM active.

In table 36, there is a classification of the three frames of reference from the TR to the LM for a total of 1,000 examples:

Table 36: The three frames of reference (*beside*)

BESIDE: THE FRAME OF REFERENCE	
Semantic value	**Number of tokens**
RELATIVE	213
INTRINSIC	769
ABSOLUTE	18
TOTAL	1,000

The table indicates that out of the 1,000 instances of frames of reference in the sample, in 213 occurrences, there was a relative frame, in 769 occurrences, there was an intrinsic frame, and in 18 occurrences, there was an absolute frame. A predominant value of an intrinsic frame between the TR and the LM is clearly observed.

2.14. Frame of reference: Relative

[2.14] Unfortunately, difficulty is often experienced in getting fertilizer down to the roots without lifting and replanting in fresh compost or otherwise considerably fouling the water. Special sachets of aquatic plant fertilizer are currently available which can be merely pushed into the container **beside** the plants. *(BNC. Garden pools, waterfalls and fountains. Booth-Moores, Andrew. London: Ward Lock Ltd, 1991).* (Beside- 281).

Dimension: topology, proximity.
Frame of reference: relative (speaker-centred).
Schema: centre-periphery. TR- the container, inanimate.
LM- beside the plants, inanimate.
There may be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry (the container could not have corners). Vantage point: speaker.

2.15. Frame of reference: Intrinsic

[2.15] All bloody! I sat up and she was kneeling **beside** me, picking at herself disgustedly, trying to get rid of the fungi and moulds. And -- unbelievably -- as I watched, the cuts and stabs in her flesh healed. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (Beside- 278).

Dimension: dynamics, movement, she was kneeling.
Frame of reference: intrinsic.
Schema: path. Horizontal axis. Motion.
TR- she, animate. LM- beside me (I), animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker (I) and landmark (I).
Mutual attention: TR active and LM active.

2.16. Frame of reference: Absolute

[2.16] Ian Norrie resumes his tour of bookshops in the regions of Britain, and finds Glasgow an industrial city **beside** the Clyde well endowed with multi-lane carriageways, flyovers and grimy churches, but also rich in art galleries, theatre, famous football teams -- and bookshops. *(BNC. Bookseller, 1994).* (Beside- 284).

Dimension: topology, proximity.
Frame of reference: absolute.
Schema: centre-periphery.
TR- the industrial city of Glasgow, inanimate.
LM- the Clyde (a city), inanimate.

There may be something in between.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry. Vantage point: speaker.

Table 37 shows a classification of the relative position of the TR to the LM and vice versa for a total of 1,000 examples:

Table 37: The relative position of *beside*

BESIDE: RELATIVE POSITION	
Semantic value	**Number of tokens**
SYMMETRY	423
ASYMMETRY	577
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative position in the sample, in 423 occurrences, there was a symmetrical position between the TR and the LM. In 577 occurrences, there was an asymmetrical position. A predominance of an asymmetrical value is observed.

2.17. Relative position: Symmetry

[2.17] And Miss Plum walks through the playground carrying two heavy bags, and in a flash I am **beside** her, smiling a face full of teeth like Tom in a Tom and Jerry cartoon. *(BNC. An alternative assembly book. Hoy, Mike and Hoy, Linda. Harlow: Longman Group UK Ltd, 1991).* (Beside- 544).

Dimension: function, operation and interaction to carry two heavy bags;
Frame of reference: relative, deictic.
Schema: centre-periphery.
Mutual attention: TR- I, animate. LM- she, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active. Vantage point: speaker (I) and trajector (I).

2.18. Relative position: Asymmetry

[2.18] Near the Clonmacnoise entrance, the river had overflowed into the fields, **beside** a misshapen castle tower that perched on a hummock, balanced at an angle and looking as if it were about to fall over. *(BNC. Jaunting through Ireland. Kerridge, Roy. London: Michael Joseph Ltd, 1991).* (Beside- 513).

Dimension: topology, proximity.
Frame of reference: absolute.
Schema: centre-periphery.

TR- the river had overflowed into the fields, animate.
LM- a misshapen castle tower (deformed tower), inanimate.
There may be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

In table 38, the animacy of the TR is, in each case, indicated for a total of 1,000 examples:

Table 38: The animacy of the trajector (*beside*)

BESIDE: THE ANIMACY OF THE TRAJECTOR	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR	691
INANIMATE TRAJECTOR	309
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR in the sample, in 691 occurrences, there was an animate TR. In 309 occurrences, there was an inanimate TR.

In table 39, the animacy of the LM is, in each case, indicated for a total of 1,000 examples:

Table 39: The animacy of the landmark (*beside*)

BESIDE: THE ANIMACY OF THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE LANDMARK	501
INANIMATE LANDMARK	499
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the LM in the sample, in 501 occurrences, there was an animate LM. In 499 occurrences, there was an inanimate LM.

In table 40, the animacy of the TR and the LM is, in each case, indicated for a total of 1,000 examples:

Table 40: The animacy of the trajector and the landmark (*beside*)

BESIDE: THE ANIMACY OF THE TRAJECTOR AND THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR AND ANIMATE LANDMARK	426
ANIMATE TRAJECTOR AND INANIMATE LANDMARK	265
INANIMATE TRAJECTOR AND INANIMATE LANDMARK	234
INANIMATE TRAJECTOR AND ANIMATE LANDMARK	75
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR and the LM in the sample, 426 instances showed an animate TR and LM, 265 instances showed an animate TR and an inanimate LM, 234 instances showed an inanimate TR and LM. Finally, 75 instances showed an inanimate TR and animate LM. Thus, the predominant value is animate TR and LM.

2.19. Animacy: Animate trajector and animate landmark

[2.19] Then he turns towards the wizened, worn-out figure of the 87-year-old woman sitting **beside** him and says: He is doing all right, there seems to be some response. What is so amazing is that this stuff keeps going on. *(BNC. Daily Telegraph, 1994).* (Beside- 371).

Dimension: dynamics, lateral orientation.
Frame of reference: intrinsic. The lateral side of the LM.
Schema: centre-periphery. Horizontal axis. Motion.
TR- the old woman, animate. LM- he, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

2.20. Animacy: Animate trajector and inanimate landmark

[2.20] Although I could not see it, we were travelling **beside** the lake where all these controversies were raging. Mrs Molloy said goodnight at her garden gate, and we rushed onward into the night. *(BNC. Jaunting through Ireland. Kerridge, Roy. London: Michael Joseph Ltd, 1991).* (Beside- 515).

Dimension: dynamics, movement, to travel; lateral orientation.
Frame of reference: intrinsic.
Schema: path. Horizontal axis. Motion.
TR- we were travelling, animate. LM- the lake, inanimate.

Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (we) and trajector (we).
No mutual attention: TR active and LM passive.

2.21. Animacy: Inanimate trajector and inanimate landmark

[2.21] Most trout fishing tackle accessories are available from the well-appointed lodge which is stilted out over the lake **beside** the car park and rearing ponds. Tackle can also be hired. Returns in recent weeks have been impressive and will improve as the weather warms. *(BNC. The East Anglian. Ipswich: East Anglian Daily Times Company, 1993).* (Beside- 445).

Dimension: function, accessibility and interaction to fish;
Frame of reference: absolute.
Schema: enablement (access).
No mutual attention: TR- the lake, inanimate. LM- the car park, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM passive. Vantage point: speaker.

2.22. Animacy: Inanimate trajector and animate landmark

[2.22] Someone had left a copy of the evening paper **beside** him, and he picked it up and glanced at the headline. Cape Colony and Natal [...] 'he muttered.' What was that darlin'?' asked Agnes, showing an interest in his every word. *(BNC. Bell in the tree. The Glasgow story. Chisnall, Edward. Edinburgh: Mainstream Pub. Ltd, 1989).* (Beside- 52).
Dimension: function, control and interaction;
Frame of reference: intrinsic.
Schema: path.
No mutual attention: TR-a copy of the evening paper, inanimate. LM- he, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM active. Vantage point: speaker.

In table 41, the relative size of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 41: The relative size of *beside*

BESIDE: RELATIVE SIZE	
Semantic value	**Number of tokens**
TR=LM	123
TR>LM	276
TR<LM	601
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative size for the TR and the LM in the sample, 123 instances showed an equal size for the TR and the LM (TR=LM), 276 instances showed the bigger TR than the LM (TR>LM), and 601 instances showed the smaller TR than the LM (TR<LM). Thus, the predominant and most frequent value is, in this case, TR<LM.

2.23. Equal relative size: TR=LM

[2.23] Dierdrie sat down noisily **beside** her friend.' Naw,' Sadie refused with a polite shake of her head. Fullup, so ahm ur.' Dierdrie accepted this formal rebuff and stuffed the remainder of her chips and peas into a small but sensuous mouth. *(BNC. Bell in the tree. The Glasgow story. Chisnall, Edward. Edinburgh: Mainstream Pub. Ltd, 1989).* (Beside- 54).

Dimension: dynamics, lateral orientation.
Frame of reference: intrinsic.
Schema: centre-periphery. Horizontal axis. Motion.
TR- Dierdrie, animate. LM-her friend, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

2.24. Unequal relative size: TR>LM

[2.24] Part of the cathedral had been roped off as a theatre, a very Sussex touch. A little later, I stood nervously **beside** my bag, hoping that I was at the right bus stop for Sligo. *(BNC. Jaunting through Ireland. Kerridge, Roy. London: Michael Joseph Ltd, 1991).* (Beside- 518).

Dimension: topology, proximity.
Frame of reference: relative.
Schema: centre-periphery. TR- I, animate.
LM- my bag at the right bus stop, inanimate.
There may be something in between.

Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (I) and trajector (I).

2.25. Unequal relative size: TR<LM

[2.25] Now the sky was blue, and we were bowling along **beside** the edge of the cliffs, with views across the water to distant strands. A jagged castle appeared on a headland, apparently a ruin. By straining my eyes, I thought I might be able to see Donegal across the bay. *(BNC. Jaunting through Ireland. Kerridge, Roy. London: Michael Joseph Ltd, 1991).* (Beside- 523).

Dimension: dynamics, movement, we were bowling along (*bowling along* (colloquial) means to travel quickly); lateral orientation.
Frame of reference: intrinsic.
Schema: path. Horizontal axis. Motion.
TR- we were bowling along, animate.
LM- the edge of the cliffs, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (we) and trajector (we).
No mutual attention: TR active and LM passive.

Table 42 shows the image schemas of the TR and the LM for a total of 1,000 examples (see section 4.5):

Table 42: The image schemas of *beside*

BESIDE: IMAGE SCHEMAS	
Semantic value	**Number of tokens**
TOPOLOGY GROUP: CENTRE-PERIPHERY	524
SPATIAL GROUP: PATH (ALONG SIDEWAYS)	362
FORCE GROUP: ENABLEMENT (ACCESS)	114
TOTAL	1,000

The table indicates that out of the 1,000 instances of the image schema between the TR and the LM in the sample, the topology schema of centre-periphery was interpreted in 524 instances. The spatial schema of path along sideways (a movement to lateral sides: right or left side) was diagnosed in 362 instances. The force schema of enablement (access to the LM to do an activity) was interpreted in 114 instances. Thus, the results show a predominant value of the topology schema (centre-periphery refers to the TR being in the centre and the LM being in the periphery).

2.26. Image Schema: Centre-periphery

[2.26] A 'High Victorian' building, it was built for an Irish metal merchant and has most of its interior courtyard and galleries intact. Its position **beside** Musgrave Street police station. *(BNC. Belfast Telegraph, 1994).* (Beside- 523).

Dimension: topology, proximity.
Frame of reference: intrinsic.
Schema: centre-periphery.
TR- the high Victorian building, inanimate.
LM- Musgrave street, inanimate.
There may be something in between.
Unequal relative size: TR>LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker.

2.27. Image schema: Path (along sideways)

[2.27] The dawn light showed a crowd of men and women with a pack of dogs running **beside** them. Cameron and James recognized none of the faces. *(BNC. King Cameron. Craig, David. Manchester: Carcanet Press, 1991, pp. 15-113).* (Beside- 630).

Dimension: dynamics, movement, to run; lateral orientation.
Frame of reference: intrinsic.
Schema: path (along sideways). Horizontal axis. Motion.
TR- a pack of dogs running, animate.
LM- A crowd of men and women, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

2.28. Image schema: Enablement (access)

[2.28] A place I know: Amid the batter of Hastings. Fiona Pitt-Kethley explains why She loves to eat **beside** the seaside. When London friends come and spend the day with me in Hastings, the first thing they all want to do is sample the fish and chips. *(BNC. Daily Telegraph,1994).* (Beside- 365).

Dimension: function, accessibility and interaction;
Frame of reference: intrinsic.
Schema: enablement (access).
No mutual attention: TR- she, animate. LM- the seaside, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

2.29. Vantage point: Speaker (I) and trajector (I) are the same

[2.29] Part of the cathedral had been roped off as a theatre, a very Sussex touch. A little later, I stood nervously **beside** my bag, hoping that I was at the right bus stop for Sligo. *(BNC. Jaunting through Ireland. Kerridge, Roy. London: Michael Joseph Ltd, 1991).* (Beside- 518).

Dimension: topology, proximity.
Frame of reference: relative.
Schema: centre-periphery.
TR- I, animate. LM- my bag at the right bus stop, inanimate.
There may not be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (I) and trajector (I).

2.30. Vantage point: A speaker and a trajector are different

[2.30] The Bajamunde farm was about 10 minutes -- 15p, with a tip -- along the coast by trishaw, an undemanding trip (even for the driver), through a long avenue of palms **beside** the beach. *(BNC. Daily Telegraph, elect, 1992).* (Beside-380).

Dimension: topology, proximity.
Frame of reference: intrinsic.
Schema: centre-periphery.
TR- A long avenue of palms, animate.
LM- the beach, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: a speaker and a trajector are different.

7.3 The case of *by*

This section is concerned with analysing the parameters and the predominant values associated with the preposition *by*. The three semantic dimensions (see section 4.2, 4.3 and 4.4) from the position of the TR to the LM for 1,000 examples can be seen in table 43:

Table 43: The semantic dimensions of *by*

BY: THE DIMENSION OF TOPOLOGY	
Semantic value	**Number of tokens**
CONTACT	6
CONTIGUITY	2
PROXIMITY	21

TOTAL	29
THE DIMENSION OF DYNAMICS	
Semantic value	**Number of tokens**
MOTION (ALONG THE SIDE OF LM/ PASSING PROXIMAL TO LM)	128
TOTAL	128
THE DIMENSION OF FUNCTION	
Semantic value	**Number of tokens**
CONTROL	246
CAUSE	44
SUPPORT	41
LINK	2
REALISATION	475
INSTRUMENT (MEANS OR TOOL)	32
TOTAL	840
UNCLASSIFIED	3
TOTAL CORPUS	1,000

The table indicates that out of the 1,000 instances in the sample, 29 showed a prominent topological relation pattern between TR and LM. In contrast, dynamics and function patterns were less relevant for interpretation. The predominant value was that the TR and the LM are in proximity in space (in 21 instances). In 6 instances, the topological relation conveyed a contact value between the TR and the LM. A contiguity value (2) was considerably less frequent. One hundred twenty-eight showed a prominent dynamic relation between TR and LM, being topology or function less relevant for interpretation. From these, in 128 instances, the TR moved along the side of the LM or was passing proximally to the LM. Finally, 840 instances showed a predominance of a functional pattern over topological or dynamic ones. In 475 occurrences, the functional pattern was realisation, where the TR was addressing the LM or vice versa for realising an action. The TR exerted control over the LM extensively in 246 examples. In 44 instances, the TR-LM relation in the scene was interpreted as a cause. Other functional relations, such as support in extending help or sustaining weight (41), instrument referring to means or tool (32) or link (2), were also interpreted in some scenes. Three instances were unclassified.

The examples of the preposition *by* are the following:

3.1. Topology: Contact

[3.1] Jersey is the largest and most southerly of the islands, (…) Warmed **by** the Gulf Stream and with an enviably mild climate, it feels like another country -- but with all the

comforts of home and duty-free shopping to boot! *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 377).

Dimension: topology, a contact of the Gulf Stream.
Frame of reference: absolute. Schema: centre-periphery.
TR- Jersey island, inanimate. LM- the Gulf Stream (Atlantic current), animate.
There may not be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry. Vantage point: speaker.

3.2. Topology: Contiguity

[3.2] Le Sport is surrounded **by** tropical gardens on a secluded bay of golden sand. A separate building of charming courtyards, shimmering pools and fountains houses the Oasis restaurant. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By-162).

Dimension: topology, contiguity.
Frame of reference: intrinsic.
There is a passive voice and agent. Schema: centre-periphery.
TR- le sport, inanimate. LM- tropical gardens, inanimate.
There may be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry. Vantage point: speaker.

3.3. Topology: Proximity

[3.3] Knowing this, film-makers added the devilish touch of putting him in crocodile skin shoes. 'It was a very nasty feeling being on the island on my own surrounded **by** crocodiles' he says, shuddering at the memory. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 453).

Dimension: topology, proximity.
Frame of reference: intrinsic (the sides: front, back, right and left).
There is a passive voice and agent. Schema: centre-periphery.
TR- I, animate. LM- crocodiles, animate.
There may be something in between. Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry. Vantage point: speaker.

3.4. Dynamics: Movement (along the side of LM/passing proximally to LM)

[3.4] Lady Davers: Come along with me. We shall go **by** his apartment. Belville enters. Mrs. Jervis: Here he is. Mrs. Jervis exits. *(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (By-16).

Dimension: dynamics, movement along the side of the LM.
Frame of reference: intrinsic.
Schema: path along a course (means). Horizontal axis.
TR- we, animate. LM- his apartment, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker and trajector.

3.5. Function: Control

[3.5] Chess wizard Bobby Fischer was beaten **by** old rival Boris Spassky yesterday -- for the first time in 20 years. The first-to-ten world title battle between the maverick American and the Russian is now all square after four games in Przno, Yugoslavia. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 621).

Dimension: function, control of a player with the other player in the chess game.
Frame of reference: intrinsic (frontal part).
Schema: passive voice and agent.
Mutual attention: TR-Bobby, animate. LM- old rival Boris, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active. Vantage point: speaker.

3.6. Function: Cause

[3.6] Steve McIvor, campaigns director for the anti-vivisection association, said: The public who support safari parks should be outraged **by** the shameful sale of monkeys for the lab trade. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By-91).

Dimension: function, cause. To be anger due to the sale of monkeys.
Frame of reference: relative.
Schema: passive voice and agent.
No mutual attention: TR- the public of safari parks (visitors), animate.
LM- the sale of monkeys, animate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active. Vantage point: speaker.

3.7. Function: Support

[3.7] The tough-guy actor -- filming smash hit movie Patriot Games which is released in Britain to-morrow -- had to be rescued **by** emergency crews after a tough underwater

fight scene left him exhausted. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 331).

Dimension: function, support and interaction, to act in the film and to rescue.
Frame of reference: relative (viewer-centred).
Schema: passive voice and agent.
Mutual attention: TR- the actor, animate. LM- emergency crews, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: speaker.

3.8. Function: Link

[3.8] Martin's body slammed into the concrete parapet.' I was very lucky I did not get wiped out completely,' he says. Later they told me my body just went up in the air, and I was hanging on **by** one hand. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 454).

Dimension: function, link (I was hanging on by one hand).
Frame of reference: relative.
Schema: passive voice and agent. Horizontal axis.
TR- I, animate. LM- one hand, animate.
Unequal relative size: TR>LM.
TR and LM are in the same position, symmetry.
Mutual attention: TR active and LM active.
Vantage point: speaker and trajector are the same.

3.9. Function: Realisation

[3.9] Tracks include Can't Help Falling In Love **by** U2 star Bono, Billy Joel's chart hit All Shook Up and Are You Lonesome Tonight sung **by** Bryan Ferry. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 129 and130).

Dimension: function, realisation and interaction.
Frame of reference: intrinsic.
Schema: passive voice and agent.
No mutual attention: TR- the song, inanimate.
LM- U2 star Bono/Bryan Ferry, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM active. Vantage point: speaker.

3.10. Function: Instrument (means or tool)

[3.10] They will visit Udairpur, the City of Dreams, the most romantic in all India. They

will even travel **by** painted elephant to the Amber Fort in the hills around Jaipur, with its huge gateways and pillared pavilions. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 450).

Dimension: function, instrument (means of transport), travelling to the Ambert Fort.
Frame of reference: intrinsic.
Schema: path along a course (means).
Mutual attention: TR- they, animate.
LM- painted elephant, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
TR active and LM active. Vantage point: speaker.

Within the dimension of function, table 44 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 840 examples:

Table 44: The intentionality of *by* (function)

BY: INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	469
MUTUAL ATTENTION	371
TOTAL	840
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	628
PASSIVE TRAJECTOR	212
TOTAL	840
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	699
PASSIVE LANDMARK	141
TOTAL	840

The table indicates that out of the 840 instances of the intentionality within the functional parameter in the sample, in 469, the relation between TR and LM showed no mutual attention and in 371 showed mutual attention. In 628 instances, the TR was active, and in 212 instances, the TR was passive. In 699 instances, the LM was active, and in 141, the LM was passive.

3.11. Intentionality (function): Mutual attention, active trajector and active landmark

[3.11]We have been instructed **by** the Malawian authorities who are responsible for our fees and nobody else is. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 461).

Dimension: function, support and interaction.
Frame of reference: relative.
Schema: passive voice and agent.
Mutual attention: TR- we, animate. LM- the Malawian authorities, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active. Vantage point: trajector (we) and speaker.

3.12. Intentionality (function): No mutual attention, passive trajector and active landmark

[3.12] A Welly bank to recycle kids' old boots has been set up in Gloucester **by** the local council and rubber firm Dunlop. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 652).

Dimension: function, control of the welly bank and interaction.
Frame of reference: relative (speaker-centred).
Schema: Passive voice and agent.
No mutual attention: TR- the Welly bank, inanimate.
LM- the local council and rubber firm Dunlop, animate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM active. Vantage point: speaker.

3.13. Intentionality (function): Mutual attention, active trajector and active landmark

[3.13] Rules Readers in the Republic of Ireland can book **by** telephoning one of Butlin's Dublin agents. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 254).

Dimension: function, realisation and interaction.
Frame of reference: relative.
Schema: path along a course (means).
Mutual attention: TR- readers, animate.
LM- telephoning one of the agents, animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active. Vantage point: speaker.

Within the dimension of dynamics, table 45 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 128 examples:

Table 45: The intentionality of *by* (dynamics)

BY: INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	68
MUTUAL ATTENTION	60
TOTAL	128
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	99
PASSIVE TRAJECTOR	29
TOTAL	128
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	75
PASSIVE LANDMARK	53
TOTAL	128

The table indicates that out of the 128 instances of the intentionality within the dynamical parameter in the sample, in 68, the relation between TR and LM showed no mutual attention and in 60 showed mutual attention. In 99 instances, the TR was active, and in 29 instances, the TR was passive. In 75 instances, the LM was active, and in 53, the LM was passive.

3.14. Intentionality (dynamics): Mutual attention, active trajector and active landmark

[3.14] He was eventually picked up **by** another driver. Brian added:' I recognised his face off the telly, but didn't realise he was such a big noise. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 674).

Dimension: dynamics, movement, to pick up.
Frame of reference: relative.
Schema: path along a course (means). Horizontal axis.
TR- he, animate. LM- another driver, animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
Mutual attention: TR active and LM active. Vantage point: speaker.

3.15. Intentionality (dynamics): No mutual attention, active trajector and passive landmark

[3.15] Lady Davers: Come along with me. We shall go **by** his apartment. Belville enters. Mrs. Jervis: Here he is. Mrs. Jervis exits. *(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (By-16).

Dimension: dynamics, movement.
Frame of reference: intrinsic.
Schema: path along a course (means). Horizontal axis. Motion.
TR- we, animate. LM- his apartment, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker and trajector.

In table 46 below, there is a classification of the three frames of reference from the TR to the LM for a total of 1,000 examples:

Table 46: The three frames of reference (*by*)

BY: THE FRAME OF REFERENCE	
Semantic value	**Number of tokens**
RELATIVE	590
INTRINSIC	408
ABSOLUTE	2
TOTAL	1,000

The table indicates that out of the 1,000 instances of frames of reference in the sample, there was a relative frame in 590 occurrences, there was an intrinsic frame in 408 occurrences, and in 2 occurrences, there was an absolute frame. A predominant value of a relative frame is clearly observed between the TR and the LM.

3.16. Frame of reference: Relative

[3.16] Until a member of the cast the sound down, "Coriolanus" continues. Pamela is chasing Belville and being caught **by** him. *(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (By-27).

Dimension: dynamics, movement.
Frame of reference: relative. There is a passive voice and agent.
Schema: path along a course (means). Horizontal axis. Motion.

TR- Pamela, animate. LM- him (Belville), animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Mutual attention: TR active and LM active.
Vantage point: speaker.

3.17. Frame of reference: Intrinsic

[3.17] It could have been -- a bird out of season, dropping bright-feathered on my shoulder [...]. It could have been a tongueless dwarf standing **by** the road to point the way. *(BNC. Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (By-44).

Dimension: topology, proximity.
Frame of reference: intrinsic.
The lateral side of the road (LM).
Schema: centre-periphery. TR- a dwarf, animate.
LM- the road, inanimate.
There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

3.18. Frame of reference: Absolute

[3.18] Jersey is the largest and most southerly of the islands, (…) Warmed **by** the Gulf Stream and with an enviably mild climate, it feels like another country -- but with all the comforts of home and duty-free shopping to boot! *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 377).

Dimension: topology, contact of the Gulf Stream.
Frame of reference: absolute.
Schema: centre-periphery. TR- Jersey island, inanimate.
LM- the Gulf Stream (Atlantic current), animate.
There may not be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

In table 47, there is a classification of the relative position from the TR to the LM and vice versa for a total of 1,000 examples:

Table 47: The relative position of *by*

BY: RELATIVE POSITION	
Semantic value	**Number of tokens**
SYMMETRY	262
ASYMMETRY	738
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative position in the sample, in 262 occurrences, there was a symmetrical position between the TR and the LM. In 738 occurrences, there was an asymmetrical position. A predominant value of an asymmetrical value is observed.

3.19. Relative position: Symmetry

[3.19] As A barmaid, I was told **by** a customer-- a Mr Brewster -- that his ancestor founded the annual Brewster Sessions when all pub licences are up for renewal. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 402).

Dimension: function, realisation and interaction with customers.
Frame of reference: relative.
Schema: passive voice and agent.
Mutual attention: TR- I, animate. LM- a customer, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: trajector and speaker.

3.20. Relative position: Asymmetry

[3.20] Lady Davers: Come along with me. We shall go **by** his apartment. Belville enters. Mrs. Jervis: Here he is. Mrs. Jervis exits. *(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (By-16).

Dimension: dynamics, movement.
Frame of reference: intrinsic.
Schema: path along a course (means). Horizontal axis. Motion.
TR- we, animate. LM- his apartment, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker and trajector.

In table 48, the animacy of the TR is, in each case, indicated for a total of 1,000 examples:

Table 48: The animacy of the trajector (*by*)

BY: THE ANIMACY OF THE TRAJECTOR	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR	736
INANIMATE TRAJECTOR	264
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR in the sample, in 736 occurrences, there was an animate TR. In 264 occurrences, there was an inanimate TR.

In table 49, the animacy of the LM is, in each case, indicated for a total of 1,000 examples:

Table 49: The animacy of the landmark (*by*)

BY: THE ANIMACY OF THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE LANDMARK	794
INANIMATE LANDMARK	206
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the LM in the sample, in 794 occurrences, there was an animate LM. In 206 occurrences, there was an inanimate LM.

In table 50, the animacy of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 50: The animacy of the trajector and the landmark (*by*)

BY: THE ANIMACY OF THE TRAJECTOR AND THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR AND ANIMATE LANDMARK	586
ANIMATE TRAJECTOR AND INANIMATE LANDMARK	150

INANIMATE TRAJECTOR AND INANIMATE LANDMARK	56
INANIMATE TRAJECTOR AND ANIMATE LANDMARK	208
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR and the LM in the sample, 586 instances showed an animate TR and LM, 150 instances showed an animate TR and an inanimate LM, 56 instances showed an inanimate TR and LM. Finally, 208 instances showed an inanimate TR and animate LM. Thus, the predominant value is animate TR and LM.

3.21. Animacy: Animate trajector and animate landmark

[3.21] My mother, many years ago, used to sing a song about a miner, warned **by** his daughter. Have you any record of it? Not even for a wind-up gramophone. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 422).

Dimension: function, realisation and interaction.
Frame of reference: relative.
Schema: passive voice and agent.
Mutual attention: TR- my mother, animate.
LM- his daughter, animate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker.

3.22. Animacy: Inanimate trajector and animate landmark

[3.22] Called Don't Go Down the Mine it was written in 1910 **by** William Geddes and Robert Donnelly. A real tear-jerker, it included lines like:' I saw the pit all afire, [...] Daddy, you know it would break my heart, if anything happened to you. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 423).

Dimension: function, realisation and interaction.
Frame of reference: relative.
Schema: passive voice and agent.
Mutual attention: TR- the text of the song, inanimate.
LM- William Geddes and Robert, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker.

3.23. Animacy: Inanimate trajector and inanimate landmark

[3.23] The pine cone hanging **by** his door. He checks it each morning to see whether it is going to rain. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 464).

Dimension: topology, proximity.
Frame of reference: intrinsic.
Schema: centre-periphery. Horizontal axis.
TR- the pine cone (the cone of a pine tree), inanimate.
LM- his door, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR passive and LM passive.
Vantage point: speaker.

3.24. Animacy: Animate trajector and inanimate landmark

[3.24] The winners will be chosen at random **by** our computer. Lines close at midnight tonight. The winners will be notified tomorrow and they can pick up their tickets at the box office. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 17).

Dimension: function, control and interaction.
Frame of reference: relative.
Schema: path along a course (means).
No mutual attention: TR- the winners, animate.
LM- our computer, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

In table 51, the relative size of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 51: The relative size of *by*

BY: RELATIVE SIZE	
Semantic value	**Number of tokens**
TR=LM	228
TR>LM	234
TR<LM	538
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative size for the TR and the LM in the sample, 228 instances showed an equal size for the TR and the LM (TR=LM), 234 instances showed the bigger TR than the LM (TR>LM), and 538 instances showed the smaller TR than the LM (TR<LM). Thus, the predominant and frequent value is, in this case, TR<LM.

3.25. Relative size: TR=LM

[3.25] Columbus is played **by** unknown George Corraface, a handsome young thing in the time-honoured, clean-cut movie mould. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 174).

Dimension: function, realisation and interaction.
Frame of reference: relative.
Schema: passive voice and agent.
Mutual attention: TR- Columbus, animate.
LM- George, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active. Vantage point: speaker.

3.26. Relative size: TR>LM

[3.26] A I think your apple tree is being attacked **by** Fruit Tree Red Spider mite. Next year spray with mancozeb when the buds begin to swell. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 264).

Dimension: function, cause.
Frame of reference: intrinsic.
Schema: passive voice and agent.
No mutual attention: TR- the apple tree, animate.
LM- fruit tree red spider mite, animate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM active. Vantage point: speaker.

3.27. Relative size: TR<LM

[3.27] He was backed **by** the Foreign Office which is advising visitors to America to follow police advice and not resist muggers. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 519).

Dimension: function, realisation and interaction, he was returning.
Frame of reference: relative.
Schema: path along a course (means).
Mutual attention: TR-he, animate.

LM- the foreign office, inanimate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: speaker.

In table 52, the image schemas of the TR and the LM are classified for a total of 76 examples in active voice (see section 4.5). These examples are formulated in the active voice, including the preposition *by* and a noun in a space. The passive construction sentences (grammatical constructions) are not classified because each passive verb (e.g., surrounded by) indicates an image schema. It is necessary to use the preposition *by* with passive verbs so that this preposition does not have a function within any image schema: The passive construction sentences do not express the construal situation or the perceptual space.

Table 52: The image schemas of *by*

BY: IMAGE SCHEMAS	
Semantic value	**Number of tokens**
TOPOLOGY SCHEMA: CENTRE-PERIPHERY	16
SPATIAL SCHEMA: PATH ALONG A COURSE (MEANS)	60
PASSIVE VOICE AND AGENT	924
TOTAL	1,000

The table indicates that out of the 1,000 instances of the image schema between the TR and the LM in the sample, the topology schema of centre-periphery, the TR in the centre and the LM in the periphery, was interpreted in 16 instances. The spatial schema of path along a course (means) was analysed in 60 cases. The predominant schema was the passive voice, and an agent was interpreted in 924 instances.

3.28. Image schema: Centre-periphery

[3.28] Stroll along the banks of the River Arno, sit in the Boboli Gardens **by** the fountains, eat hearty pizzas or huge dramatic sandwiches stuffed with cheese, tomato and salami for around 3. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 119).

Dimension: topology, proximity.
Frame of reference: intrinsic.
Schema: centre-periphery. Horizontal axis.
No motion. TR- the Boboli Gardens, inanimate.
LM- the fountains, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.

No mutual attention: TR passive and LM passive.
Vantage point: speaker.

3.29. Image schema: Path along a course (means)

[3.29] He enters upstage, makes a small arc and leaves **by** the same side, a few feet downstage. Ros and Guil, holding the belts taut, stare at him in some bewilderment. (BNC. *Rosencrantz and Guildenstern are dead. Stoppard, Tom. London: Faber & Faber Ltd, 1986, pp. 9-93).* (By- 61).

Dimension: dynamics, movement, by the same side, the lateral side of LM.
Frame of reference: intrinsic.
Schema: Path along a course (means). Horizontal axis. Motion.
TR- he, animate. LM- by the same side, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker.

3.30. The vantage point: Speaker and trajector are the same

[3.30] Lady Davers: Come along with me. We shall go **by** his apartment. Belville enters. Mrs. Jervis: Here he is. Mrs. Jervis exits. *(BNC. Pamela, or, The reform of a rake: a play adapted from the novel by Samuel Richardson. Morgan, Fidelis and Giles Havergal. UK: Amber Lane Press, 1987, pp. 5-77).* (By-16).

Dimension: dynamics, movement.
Frame of reference: intrinsic.
Schema: path along a course (means). Horizontal axis. Motion.
TR- we, animate. LM- his apartment, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
No mutual attention: TR active and LM passive.
Vantage point: speaker (I) and trajector (we) are the same.

3.31. The vantage point: Speaker and trajector are different

[3.31] They will visit Udairpur, the City of Dreams, the most romantic in all India. They will even travel **by** painted elephant to the Amber Fort in the hills around Jaipur, with its huge gateways and pillared pavilions. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (By- 450).

Dimension: function, instrument (means of transport), travelling to the Ambert Fort.
Frame of reference: intrinsic.

Schema: path along a course (means).
Mutual attention: TR- they, animate.
LM- painted elephant, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: speaker and trajector are different.

7.4 The case of *near*

This section includes the analysis of *near* with its parameters and its semantic values. Table 53 below shows the three perceptual dimensions, and within each dimension, the relevant values highlighting the position of the TR to the LM for 1,000 examples (see section 4.2, 4.3 and 4.4):

Table 53: the semantic dimensions of *near*

NEAR: THE DIMENSION OF TOPOLOGY	
Semantic value	**Number of tokens**
PROXIMITY	196
TOTAL	196
THE DIMENSION OF DYNAMICS	
Semantic value	**Number of tokens**
MOTION (TO A RELATIVE ORIENTATION/ UNDETERMINED AXIS)	204
TOTAL	204
THE DIMENSION OF FUNCTION	
Semantic value	**Number of tokens**
(POTENTIAL) INTERACTION	179
ACCESSIBILITY	416
TOTAL	595
UNCLASSIFIED	5
TOTAL CORPUS	1,000

The table indicates that out of the 1,000 instances in the sample, in 196, the relation between TR and LM showed a prominent topological pattern, and dynamics and function patterns were less relevant for interpretation. The semantic value was that the TR and the LM are in proximity in space (in 196 instances). Two hundred four showed a prominent dynamic relation between the TR and the LM, being topology or function

less relevant for interpretation. Thus, in 204 instances, the TR moved to a relative orientation or undetermined axis. In 595 occurrences, the functional pattern was predominant. The TR addressed the LM for a potential interaction in 179 instances, the TR has prominent accessibility to the LM in 416 instances, and 5 were unclassified.

The examples of *near* are the following:

4.1. Topology: Proximity

[4.1] Our choice has been influenced by the fact that there is no national museum in the North East,' said Dr Alan Borg, museum director-general. The only 'branch' war museum outside London is Duxford, **near** Cambridge, featuring aircraft. *(BNC. Newspaper: Daily Telegraph, 1992).* (Near- 404).

Dimension: topology, proximity (Duxford near Cambridge).
Frame of reference: absolute.
Schema: near-far.
TR- The only 'branch' war museum is Duxford, inanimate.
LM- Cambridge, inanimate.
There may be something in between.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Off stage, away from the scene.

4.2. Dynamics: Movement to a relative orientation/undetermined axis

[4.2] Danger is more likely to come from pedestrians and motorists moving too **near** the swept path, the trams will negotiate on tight bends on central streets. *(BNC. London: The Daily Telegraph plc, 1992).* (Near-229).

Dimension: dynamics, movement, pedestrian and motorists moving; relative orientation.
Frame of reference: relative (speaker-centred, the name of the path does not appear).
Schema: near-far. Horizontal axis. Motion.
TR- pedestrian and motorists, animate.
LM- the swept path, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Off stage, away from the scene.
No mutual attention: TR active and LM passive.

4.3. Function: Potential interaction

[4.3] He aims to protect neighbours from the mess and smell by draining muck and manure into two ponds -- well away from their homes. Sir Andrew is seeking planning

permission for the work **near** Newbury, Berks. *(BNC. The Daily Mirror, 1994).* (Near-197).

Dimension: function, interaction to planning permission for the work.
Frame of reference: relative (viewer-centred).
Schema: near-far.
There is no mutual attention: TR- Sir Andrew (planning permission for the work), animate. LM- Newbury, Berks, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.4. Function: Accessibility

[4.4] The butterfly lizard leiolepis bellani lives **near** beaches and sandy areas in tropical South-east Asia. Its main claim to fame is its elongated ribs with which the lizard can extend a short fringe of skin along either side of its body. *(BNC. London: Guardian Newspapers).* (Near- 224).

Dimension: function, accessibility to live near beaches and sandy areas.
Frame of reference: relative (speaker-centred).
Schema: near-far.
No mutual attention: TR- the butterfly lizard leiolepis bellani, animate.
LM- beaches and sandy areas (in tropical South-east Asia), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker. Off stage, away from the scene.

Within the dimension of function, table 54 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 595 examples:

Table 54: the intentionality of *near* (function)

NEAR: INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	585
MUTUAL ATTENTION	10
TOTAL	595
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**

ACTIVE TRAJECTOR	562
PASSIVE TRAJECTOR	33
TOTAL	595
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	24
PASSIVE LANDMARK	571
TOTAL	595

The table indicates that out of the 595 instances of the intentionality within the functional parameter in the sample, in 585, the relation between TR and LM showed no mutual attention and in 10 showed mutual attention. In 562 instances, the TR was active, and in 33 instances, the TR was passive. In 24 instances, the LM was active, and in 571, the LM was passive.

4.5. Intentionality (function): No mutual attention, active trajector and passive landmark

[4.5] Dolphins swimming **near** the barrier altered their behaviour to avoid it, the result, the scientists believe, of them detecting sonar echoes from the reflectors. *(BNC. Daily Telegraph, 1992).* (Near- 226).

Dimension: function, accessibility, dolphins swim near the barrier.
Frame of reference: relative (speaker-centred).
Schema: near-far.
No mutual attention: TR- Dolphins swimming, animate.
LM- the barrier, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.6. Intentionality (function): Mutual attention, active trajector and active landmark

[4.6] All the relatives are giving Farrah lots of hugs and kisses.' Everyone wants to be **near** her. She looks fantastic and is bearing up really well. *(BNC. The Daily Mirror, 1994).* (Near- 191).

Dimension: function, interaction to talk with them.
Frame of reference: relative (speaker-centred).
Schema: near-far.
Mutual attention: TR- All the relatives, everyone (giving Farrah lots of hugs and kisses), animate.
LM- she (the baby), animate.

Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker. Off stage, away from the scene.

Within the dimension of dynamics, table 55 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 204 examples:

Table 55: the intentionality of *near* (dynamics)

NEAR: INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	193
MUTUAL ATTENTION	11
TOTAL	204
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	181
PASSIVE TRAJECTOR	23
TOTAL	204
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	17
PASSIVE LANDMARK	187
TOTAL	204

The table indicates that out of the 204 instances of the intentionality within the dynamical parameter in the sample, in 193, the relation between TR and LM showed no mutual attention and 11 showed mutual attention. In 181 instances, the TR was active, and in 23 instances, the TR was passive. In 17 instances, the LM was active, and in 187, the LM was passive.

4.7. Intentionality (dynamics): No mutual attention, active trajector and passive landmark

[4.7] Danger is more likely to come from pedestrians and motorists moving too **near** the swept path, the trams will negotiate on tight bends on central streets. *(BNC. London: The Daily Telegraph plc, 1992).* (Near-229).

Dimension: dynamics, movement, pedestrian and motorists moving; relative orientation.
Frame of reference: relative (speaker-centred).
Schema: near-far. Horizontal axis. Motion.
TR- pedestrian and motorists moving, animate.
LM- the swept path, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Off stage, away from the scene.
No mutual attention: TR active and LM passive.

4.8. Intentionality (dynamics): Mutual attention, active trajector and active landmark

[4.8] Tom Boyd, proving that Celtic might be better served by more crosses, placed the ball on the head of the substitute, Andy Payton, who scored with no defender **near** him. *(BNC. Scotsman newspaper, 1994).* (Near- 816).

Dimension: dynamics, movement in the game (Andy with no defender near him).
Frame of reference: relative (speaker-centred).
Schema: near-far.
Mutual attention: TR- Andy, animate. LM- him (anaphora- he), animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker. Off stage, away from the scene.

In table 56, there is a classification of the three frames of reference from the TR to the LM for a total of 1,000 examples:

Table 56: the three frames of reference (*near*)

NEAR: THE FRAME OF REFERENCE	
Semantic value	**Number of tokens**
RELATIVE	881
ABSOLUTE	119
TOTAL	1,000

The table indicates that out of the 1,000 instances of frames of reference in the sample, in 881 occurrences, there was a relative frame, and in 119 occurrences, there was an absolute frame. A predominant value of a relative frame is clearly observed between the TR and the LM.

4.9. Frame of reference: Relative

[4.9] Born of gentlefolk, she lived **near** Godalming in west Surrey. As a child she roamed freely along the country lanes, knew the wild flowers by name and smell and the birds in dialect. *(BNC. Guardian, elect, 1994).* (Near- 267).

Dimension: function, interaction in the area where she lives.
Frame of reference: relative (speaker-centred).
The speaker is who knows about her.
Schema: near-far (without a central point).
No mutual attention: TR- she, animate.
LM- Godalming in west Surrey, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.10. Frame of reference: Absolute

[4.10] But he says we need a lot more heavy rain before he can roll up and put away his prayer mat. Under water [...] aftermath of the River Severn overflowing **near** Tewkesbury. *(BNC. Guardian newspaper, 1994).* (Near- 537).

Dimension: dynamics, movement, the overflowing river; relative orientation.
Frame of reference: absolute (environmental gradient and fixed bearings).
Schema: near-far. Horizontal axis. Motion.
TR- the River Severn overflowing, animate.
LM- Tewkesbury, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Off stage, away from the scene.
No mutual attention: TR active and LM passive.

Table 57 shows the relative position of the TR to the LM and vice versa for a total of 1,000 examples:

Table 57: the relative position of *near*

NEAR: RELATIVE POSITION	
Semantic value	**Number of tokens**
SYMMETRY	22
ASYMMETRY	978
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative position in the sample, in 22 occurrences, there was a symmetrical position between the TR and the LM. In 978 occurrences, there was an asymmetrical position. A value of asymmetry is predominant.

4.11. Relative position: Symmetry

[4.11] The principal rooms look out over Mylor Harbour and Carrick Roads, one of Britain's most beautiful estuaries and busiest day sailing haunts. At Otter Bridge, a deep water mooring **near** the house can be rented. *(BNC. Daily Telegraph, 1994).* (Near-339).

Dimension: topology, proximity.
Frame of reference: absolute (fixed bearings).
Schema: near-far.
TR- a deep water mooring (place: for securing boats), inanimate.
LM- the house, inanimate.
There may be something in between.
Unequal relative size: TR>LM.
TR and LM are in the same position, symmetry (position).
Vantage point: speaker. Off stage, away from the scene.

4.12. Relative position: Asymmetry

[4.12] The stars **near** the middle of the map rise in the east at 05.00 tomorrow and at 04.00 on Christmas Day, climbing to reach the places shown above the ESE to SE horizon at daybreak tomorrow. *(BNC. Guardian, elect, 1994).* (Near- 515).

Dimension: dynamics, movement, to rise in the east. Relative orientation.
Frame of reference: absolute (environment-centred).
Although stars move in a direction, they stand for an absolute frame of reference.
Schema: scale. Horizontal axis. Motion.
TR- the stars, animate.
LM- the middle of the map (rise in the east at 05.00 tomorrow and at 04.00 on Christmas Day), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Off stage, away from the scene.

In table 58, the animacy of the TR is, in each case, indicated for a total of 1,000 examples:

Table 58: the animacy of the trajector (*near*)

NEAR: THE ANIMACY OF THE TRAJECTOR	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR	773
INANIMATE TRAJECTOR	227
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR in the sample, in 773 occurrences, there was an animate TR. In 227 occurrences, there was an inanimate TR.

In table 59, the animacy of the LM is, in each case, indicated for a total of 1,000 examples:

Table 59: the animacy of the landmark (*near*)

NEAR: THE ANIMACY OF THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE LANDMARK	47
INANIMATE LANDMARK	953
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the LM in the sample, in 47 occurrences, there was an animate LM. In 953 occurrences, there was an inanimate LM.

In table 60, the animacy of the TR and the LM is, in each case, indicated for a total of 1,000 examples:

Table 60: the animacy of the trajector and the landmark (*near*)

NEAR: THE ANIMACY OF THE TRAJECTOR AND THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR AND ANIMATE LANDMARK	41
ANIMATE TRAJECTOR AND INANIMATE LANDMARK	732
INANIMATE TRAJECTOR AND INANIMATE LANDMARK	221
INANIMATE TRAJECTOR AND ANIMATE LANDMARK	6
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR and the LM in the sample, 41 instances showed an animate TR and LM, 732 instances showed an animate TR and an inanimate LM, 221 instances showed an inanimate TR and LM. Finally, 6 instances showed an inanimate TR and animate LM. Thus, the predominant value is animate TR and inanimate LM.

4.13. Animacy: Animate trajector and animate landmark

[4.13] They told us that they were good poachers: they never poached deer, or cut fences, or ran their dogs **near** in-lamb ewes. *(BNC. Daily Telegraph, elect, 1994).* (Near- 370).

Dimension: function, accessibility and interaction to hunt/to poach in the fields;
Frame of reference: relative (speaker-centred).
Schema: near-far.
Mutual attention: TR- their dogs, animate.
LM- in-lamb ewes (female sheep), animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker. Off stage, away from the scene.

4.14. Animacy: Animate trajector and inanimate landmark

[4.14] With her diet sorted out, Lisa was also advised to do a lot more exercise, because her job entailed driving around all day rather than walking. Now she has started jogging **near** her home in Diss, Norfolk.' I'm going to really get going,' she says.' I'm also joining my local gym. *(BNC. Today. London: News Group Newspapers Ltd, 1992).* (Near- 651).

Dimension: function, interaction (she has started jogging).
Frame of reference: relative (viewer-centred).
Schema: near-far (jogging near her home).
There is no mutual attention: TR (who has started jogging), animate.
LM- her home (in Diss, Norfolk), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.15. Animacy: Inanimate trajector and inanimate landmark

[4.15] Once the huge car park **near** the Louvre is finished in 1991, tourist coaches will be banned from the centre. Parisians remain unconvinced that the project will be approved. *(BNC. Independent, elect, 1994).* (Near-471).

Dimension: function, accessibility (to finish the project of the huge car park).
Frame of reference: absolute (fixed bearings).
Schema: near-far.
No mutual attention: TR- the huge car park, inanimate.
LM- the Louvre, inanimate. Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.16. Animacy: Inanimate trajector and animate landmark

[4.16] Tesco makes just under seven per cent. Yet Food Giant only takes around four per cent profit. And they say that's plenty for a healthy business. If the chain proves popular you could soon have a Food Giant **near** you. They don't have to build their stores from scratch. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (Near-17).

Dimension: topology, proximity.
Frame of reference: relative (speaker-centred).
Schema: near-far. TR- the food giant (shop), inanimate.
LM- you, animate. There may be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker and hearer (you). Off stage, away from the scene.

In table 61, the relative size of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 61: the relative size of *near*

NEAR: RELATIVE SIZE	
Semantic value	**Number of tokens**
TR=LM	8
TR>LM	40
TR<LM	952
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative size for the TR and the LM in the sample, 8 instances showed an equal size for the TR and the LM (TR=LM), 40 instances showed the bigger TR than the LM (TR>LM), and 952 instances showed the smaller TR than the LM (TR<LM). Thus, the predominant and frequent value is, in this case, TR<LM.

4.17. Relative size: TR=LM

[4.17] Tom Boyd, proving that Celtic might be better served by more crosses, placed the ball on the head of the substitute, Andy Payton, who scored with no defender **near** him. *(BNC. Scotsman newspaper, 1994).* (Near- 816).

Dimension: function, accessibility of the game and interaction (Andy with no defender near him).
Frame of reference: relative (the relative orientation of the players).
Schema: near-far.
Mutual attention: TR- Andy, animate. LM- him (anaphora- he), animate.
Equal relative size: TR=LM.
TR and LM are not in the same position, asymmetry.
TR active and LM active.
Vantage point: speaker. Off stage, away from the scene.

4.18. Relative size: TR>LM

[4.18] Further up the Rhone valley **near** the market town of Cavaillon, there has been a worrying development in what has become known as The War of the Bakers. The small bakers' shops, of which there are fewer and fewer, are finding new competition from chain shop bakers supplied by baker factories. *(BNC. Scotsman newspaper, 1994).* (Near-622).

Dimension: topology and function, proximity and interaction (the competition/the war of bakers).
Frame of reference: absolute (fixed bearings).
Schema: near-far.
No mutual attention: TR- Further up the Rhone valley, inanimate.
LM- the market town of Cavaillon, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.19. Relative size: TR<LM

[4.19] The white ground has the effect of making light seem to emanate from within pictures like the great Picardy Coast Scene with Children -- Sunrise owned by HM the Queen or A Fishmarket **near** Boulogne from the Yale Centre for British Art. *(BNC. Daily Telegraph, 1994).* (Near- 832).

Dimension: topology and function, proximity, interaction (the painting of sunrise is owned by HM the Queen or A Fishmarket).
Frame of reference: relative (speaker-centred).

Schema: near-far.
There is no mutual attention: TR- the painting of Sunrise owned by HM the Queen or a Fishmarket, inanimate. LM- Boulonge, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM passive.
Vantage point: speaker. Off stage, away from the scene.

Our conceptual or perceptual experience construes the localisations according to the near-far schema. The things considered near depend upon the context, but when this schema occurs, there is no centre. In contrast, the scale schema helps decide relative nearness to the central point, such as being near the bottom, the top or the middle of a position.

In table 62, the image schemas of the TR and the LM are classified for a total of 1,000 examples (see section 4.5):

Table 62: the image schemas of *near*

NEAR: IMAGE SCHEMAS	
Semantic value	**Number of tokens**
TOPOLOGY SCHEMA: SCALE (RELATIVE NEARNESS)	8
TOPOLOGY SCHEMA: NEAR-FAR (WITHOUT A CENTRAL POINT)	992
TOTAL	1,000

The table indicates that out of the 1,000 instances in the sample, the topology schema of near-far (without a central point) was interpreted in 992 cases. The topology schema of scale in the viewpoint of a relative nearness was interpreted in 8 instances. Thus, the predominant topology schema was the near-far schema.

4.20. Image schema: Scale

[4.20] The stars **near** the middle of the map rise in the east at 05.00 tomorrow and at 04.00 on Christmas Day, climbing to reach the places shown above the ESE to SE horizon at daybreak tomorrow. *(BNC. Guardian, elect, 1994).* (Near- 515).

Dimension: dynamics, movement, to rise in the east. Relative orientation.
Frame of reference: absolute (environment-centred).
Schema: scale (the stars near the middle of the map).
The position of being near the middle depends on a scale.
TR- the stars, animate. LM- the middle of the map, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Off stage, away from the scene.

4.21. Image schema: Near-far

[4.21] Repairs to Clock Tower at Polesden Lacey, **near** Dorking, are now complete and visitors can see the house free of scaffolding. *(BNC.The Alton Herald. Farnham, Surrey: Farnham Castle Newspapers Ltd, 1992)*. (Near- 889).

Dimension: function, accessibility of the clock tower (Repairs to Clock Tower at Polesden Lacey).
Frame of reference: absolute (fixed bearings).
Schema: near-far (there is not a central point).
No mutual attention: TR- Clock Tower at Polesden Lacey, inanimate.
LM- Dorking, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR passive and LM passive.
Vantage point: speaker. Off stage, away from the scene.

4.22. The vantage point: A speaker different from a trajector

[4.22] The big bang Thick black clouds hover over a village **near** the Pinatubo volcano. Right, how the ash cloud has cooled the earth. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (Near- 31).

Dimension: topology, proximity, the village near the volcano; relative orientation.
Frame of reference: absolute (environment-centred, fixed bearings).
Schema: near-far. Horizontal axis.
TR- a village, inanimate. LM- the Pinatubo volcano, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: a speaker different from a trajector. Off stage, away from the scene.
No mutual attention: TR passive and LM active.

4.23. The vantage point: A speaker and a trajector are the same

[4.23] As I've said before, it's not really realistic to expect us to win the league but the others have to try to catch us first.' If we can stay at or **near** the top until Christmas, then our chances get even better and we can certainly expect to finish in the top six at least. *(BNC. The Daily Mirror, 1994).* (Near- 90).

Dimension: topology, proximity.
Frame of reference: relative.
Schema: scale, a position in the list.
TR-we, animate. LM-the top of the list, inanimate.
There may be something in between.
Unequal relative size: TR>LM.

TR and LM are not in the same position, asymmetry.
Vantage point: speaker (we) and trajector (we).

7.5 The case of *next to*

This section presents the analysis of *next to* including the parameters and their significant values in each table. Table 63 shows the grouping of the three semantic and perceptual dimensions from the position of the TR to the LM for 1,000 examples (see section 4.2, 4.3 and 4.4):

Table 63: the semantic dimensions of *next to*

NEXT TO: THE DIMENSION OF TOPOLOGY	
Semantic value	**Number of tokens**
CONTIGUITY	193
PROXIMITY	94
TOTAL	287
THE DIMENSION OF DYNAMICS	
Semantic value	**Number of tokens**
MOVEMENT (LATERAL ORIENTATION)	121
SEQUENCE	408
TOTAL	529
THE DIMENSION OF FUNCTION	
Semantic value	**Number of tokens**
CONTROL	16
INTERACTION (SEQUENTIAL ORGANISATION)	168
TOTAL	184
TOTAL CORPUS	1,000

The table indicates that out of the 1,000 instances in the sample, in 287, the relation between TR and LM showed a prominent topological pattern. In contrast, dynamics and function patterns were less relevant for interpretation. The predominant value was that the TR and the LM are in a position of contiguity (in 193 instances). In 94 instances, the topological relation conveyed the value of proximity between the TR and the LM. Five hundred twenty-nine showed a prominent dynamic relation between TR and LM, being topology or function less relevant for interpretation. From these, in 121 instances, the TR moved to a lateral orientation to the LM, and 408 instances showed the value of sequence in the sense that the TR and the LM are in a sequential movement. Finally, 184 instances showed a predominance of a functional pattern over topological or

dynamic ones. The TR exerted control over the LM extensively in 16 examples. In 168 instances, the TR-LM relation in the scene was interpreted as interaction in the sense of a sequential organisation.

The examples of *next to* are the following:

5.1. Topology: Contiguity

[5.1] I saw that my faded garment was being hung in the closet **next to** four well-tailored officers' overcoats, gold stars shining on pale blue epaulets, the insignia of the AVO, the state security police. *(BNC. Guardian, elect. newspaper, 1994).* (Next to-24).

Dimension: topology, contiguity.
Frame of reference: intrinsic.
Schema: linear order.
TR- my faded garment in the closet (storage space), inanimate.
LM- four well-tailored officers' overcoats, inanimate.
There may not be something in between.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (I) and trajector are not the same.

5.2. Topology: Proximity

[5.2] Among the most important information was news from Switzerland of a sketch for the Mona Lisa, with the artist's working notes scribbled on the reverse, five other drawings from the Windsor Collection, a map of the New World showing Florida as an island **next to** Japan, and a plate decorated with phalluses, missing since the 1830s. *(BNC. London: The Daily Telegraph plc, 1992).* (Next to-55).

Dimension: topology, proximity. Lateral orientation of LM.
Frame of reference: absolute.
Schema: sequence (contiguous).
TR- Florida as an island, inanimate. LM- Japan, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

5.3. Dynamics: Movement (lateral orientation)

[5.3] I hope you have all been practising during the holiday,' said Miss Hardbroom, as the girls all lined up with their brooms hovering **next to** them and the cats perched on the back, that is to say, most of the cats were perched on the back. *(BNC. A bad spell for the worst witch. Murphy, Jill. Harmondsworth: Puffin, 1988, pp. 7-128).* (Next to-352).

Dimension: dynamics, movement (lateral orientation), the girls all lined up with their brooms.
There is a movement to a lateral orientation in the sense that their brooms are hovering/hanging in the air next to them.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. Motion.
TR- their brooms (tool for sweeping), inanimate.
LM- them (they), animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Mutual attention: TR passive and LM active.

5.4. Dynamics: Sequence

[5.4] Why are you here, my lord?' I said. He smiled.' Because I want to meet you, Mary,' he said.' I want you to come with me to my castle.' He rode **next to** me, and his men rode between me and my friends. *(BNC. Mary Queen of Scots: Oxford Bookworms edition. Vicary, Tim. Oxford: OUP, 1992, pp. 1-39).* (Next to-545).

Dimension: dynamics, sequence, he rode next to me.
There is a value of sequence in the sense that they are contiguous.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. Motion.
TR- he, animate.
LM- me (I), animate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

5.5. Function: Control

[5.5] The farmer put Tess **next to** the threshing-machine, so that she had the hardest and most tiring job of all. She had little chance to talk or rest, and at lunch time was about to start eating when she noticed d'Urberville approaching. *(BNC. Tess of the d'Urbervilles: Oxford Bookworms edition. West, Clare. Oxford: OUP, 1989, pp. 1-119).* (Next to-720).

Dimension: function, control (Tess next to the threshing machine). Also, the dimension of topology (contiguity) may be interpreted.
The predominant value is control in the sense that Tess is located next to the threshing machine and controls the device (to separate the grain from a cereal plant).
Using another preposition could be possible in this example, but the sense would not be the same. Also, in using objects such as a chair next to another chair, the sense is not control but contiguity. Therefore, the use of a preposition may determine the semantic value.
Frame of reference: intrinsic. Schema: sequence (contiguous).

No mutual attention: TR- Tess, animate. LM- the threshing machine, inanimate. Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive. Vantage point: speaker.

5.6. Function: Interaction (sequential organisation)

[5.6] The ocean tilted up to meet him, its dark surface studded with points of light that looked like constellations, fallen stars. The tourist sitting **next to** him asked him what they were. *(BNC. The five gates of hell. Thomson, Rupert. London: Bloomsbury Pub. Ltd, 1991, pp. 123-226).* (Next to-309).

Dimension: function, interaction (the tourist sitting and asked him).
The tourist is next to another person, and this position is contiguous so that this contiguity facilitates an interaction.
Frame of reference: intrinsic.
Schema: sequence (contiguous).
Mutual attention: TR- the tourist, animate. LM- him (he), animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
TR active and LM active.
Vantage point: speaker. Mutual attention: TR active and LM active.

Within the dimension of function, table 64 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 184 examples:

Table 64: the intentionality of *next to* (function)

NEXT TO: INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	141
MUTUAL ATTENTION	43
TOTAL	184
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	122
PASSIVE TRAJECTOR	62
TOTAL	184
INTENTIONALITY (FUNCTION)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	94

PASSIVE LANDMARK	90
TOTAL	184

The table indicates that out of the 184 instances of the intentionality within the functional parameter in the sample, in 141, the relation between TR and LM showed no mutual attention and in 43 showed mutual attention. In 122 instances, the TR was active, and in 62 instances, the TR was passive. In 94 instances, the LM was active, and in 90, the LM was passive.

5.7. Intentionality (function): No mutual attention, active trajector and passive landmark

[5.7] They squat on ragged patches of grass like abandoned containers, painted bright colours, stuffed with more than anyone could want of Do-It-Yourself Equipment, Garden Furniture or, in one case, pure Leather. The Quigleys live **next to** a park. Their house is semi-detached. *(BNC. They came from SW19. Williams, Nigel. London: Faber & Faber Ltd, 1992, pp. 119-250).* (Next to-940).

Dimension: function, interaction (the Quigleys live);
Frame of reference: intrinsic.
Schema: sequence (contiguous).
No mutual attention: TR- the Quigleys, animate. LM- a park, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
TR active and LM passive.
Vantage point: speaker.

5.8. Intentionality (function): Mutual attention, active trajector and active landmark

[5.8] The ocean tilted up to meet him, its dark surface studded with points of light that looked like constellations, fallen stars. The tourist sitting **next to** him asked him what they were. *(BNC. The five gates of hell. Thomson, Rupert. London: Bloomsbury Pub. Ltd, 1991, pp. 123-226).* (Next to-309).

Dimension: dynamics and function, sequence and interaction (the tourist sitting and asked him).
Frame of reference: intrinsic.
Schema: sequence (contiguous).
Mutual attention: TR- the tourist, animate. LM- him (he), animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

Within the dimension of dynamics, table 65 below indicates the intentionality from the TR to the LM and the most dynamic and physical entity for the 529 examples:

Table 65: the intentionality of *next to* (dynamics)

NEXT TO: INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
NO MUTUAL ATTENTION	196
MUTUAL ATTENTION	333
TOTAL	529
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE TRAJECTOR	458
PASSIVE TRAJECTOR	71
TOTAL	529
INTENTIONALITY (DYNAMICS)	
Semantic value	**Number of tokens**
ACTIVE LANDMARK	368
PASSIVE LANDMARK	161
TOTAL	529

The table indicates that out of the 529 instances of the intentionality within the dynamical parameter in the sample, in 196, the relation between TR and LM showed no mutual attention and in 333 showed mutual attention. In 458 instances, the TR was active, and in 71 instances, the TR was passive. In 368 instances, the LM was active, and in 161, the LM was passive.

5.9. Intentionality (dynamics): Mutual attention, active trajector and active landmark

[5.9] Tuan Ti Fo said, going across and kneeling **next to** him. She's a friend.' He half turned, looking back at Marie.' This is Kim. Kim, this is Marie.' She came across, then stood there, shaking her head. *(BNC. Chung Kuo: The white mountain. Wingrove, David. Sevenoaks: New English Library, 1991, pp. 91-171).* (Next to-679).

Dimension: dynamics, movement, Tuan was kneeling next to him. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. Motion.
TR- Tuan, animate. LM- him (he), animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

5.10. Intentionality (dynamics): No mutual attention, active trajector and passive landmark

[5.10] In a hotel corridor, a very tall man in a vest, braces and crumpled suit is stooped **next to** a door, demonstrating that he has no more notion of how a Savoy room key works than your ordinary mortal. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (Next to-3).

Dimension: dynamics, movement, to bend/to stoop next to a door. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. No Motion.
TR- a very tall man, animate.
LM- a door, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.
No mutual attention: TR active and LM passive.

In table 66 below, there is a classification of the three frames of reference from the TR to the LM for a total of 1,000 examples:

Table 66: the three frames of reference (*next to*)

NEXT TO: THE FRAME OF REFERENCE	
Semantic value	**Number of tokens**
INTRINSIC	938
ABSOLUTE	62
TOTAL	1,000

The table indicates that out of the 1,000 instances of frames of reference in the sample, in 938 occurrences, there was an intrinsic frame, and in 62 occurrences, there was an absolute frame. A value of an intrinsic frame between the TR and the LM is clearly predominant.

5.11. Frame of reference: Intrinsic

[5.11] The Ship wailed again.' Er,' came Angalo's hugely amplified voice, apparently talking to someone else.' I'm not sure about this switch, but maybe it's [...]. Certainly, I'm going to press it, why shouldn't I press it? It's **next to** the door one, it must be safe. *(BNC. Wings. Pratchett, Terry. London: Corgi Books, 1992, pp. 13-172).* (Next to-373).

Dimension: topology, proximity.
Frame of reference: intrinsic (the lateral side).

Schema: sequence (contiguous).
TR- the switch, inanimate.
LM- the door one, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker.

5.12. Frame of reference: Absolute

[5.12] The 250-acre site **next to** the river near Stockton sprang to prominence in 1987 when Mrs Margaret Thatcher' walked into the wilderness' in front of the nation's press photographers, and pledged that the site would be transformed. *(BNC. Newspaper: Northern Echo, 1994)*. (Next to-135).

Dimension: topology, proximity.
Frame of reference: absolute (fixed bearings and environment-centred).
Schema: sequence.
TR- the 250-acre site, inanimate.
LM- the river, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position or size, asymmetry.
Vantage point: speaker.

In table 67, there is a classification of the relative position of the TR and LM and vice versa for a total of 1,000 examples:

Table 67: The relative position of *next to*

NEXT TO: RELATIVE POSITION	
Semantic value	**Number of tokens**
SYMMETRY	526
ASYMMETRY	474
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative position in the sample, in 526 occurrences, there was a symmetrical position between the TR and the LM. In 474 occurrences, there was an asymmetrical position. Symmetry is slightly predominant.

5.13. Relative position: Symmetry

[5.13] Alec moved up to the plane and ran a loving hand along its polished propeller blade.' Nellie, the pride of the islands. She'll do a good two hundred miles an hour, and

though she's got dual control you can take out the second seat **next to** the pilot's to make room for a stretcher. *(BNC. The other side of paradise. Barber, Noel. London: Coronet Books, 1992, pp. 3-108).* (Next to-390).

Dimension: dynamics, sequence, you can take out the second seat; lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis.
TR- the second seat, inanimate. LM- the pilot's seat, inanimate.
Equal relative size: TR=LM. TR and LM are in the same position, symmetry.
Vantage point: speaker and hearer (you). No mutual attention: TR passive and LM passive.

5.14. Relative position: Asymmetry

[5.14] She examined the small room minutely, the books on the shelf -- reading out all their titles aloud -- the three prints on the wall, "The Education of the Young Raleigh", "Derwentwater at Dawn" and "The Drunkard's Children" -- drew her boots appreciatively over the mat, picked up the jug of pencils and finally came to the oven which was **next to** the sink. *(BNC. My favourite stories of Lakeland. Bragg, Melvyn. Cambridge: Lutterworth Press, 1981, pp. 117-122).* (Next to-432).

Dimension: topology and dynamics, contiguity and movement, the children came to the oven next to the sink.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis.
TR- the oven, inanimate.
LM- the sink, inanimate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
The oven is next to the sink. The oven and the sink are not identical on both sides.
Vantage point: speaker. No mutual attention: TR passive and LM passive.

In table 68, the animacy of the TR is shown for a total of 1,000 examples:

Table 68: the animacy of the trajector (*next to*)

NEXT TO: THE ANIMACY OF THE TRAJECTOR	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR	695
INANIMATE TRAJECTOR	305
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR in the sample, in 695 occurrences, there was an animate TR. In 305 occurrences, there was an inanimate TR.

In table 69, the animacy of the LM is, in each case, indicated for a total of 1,000 examples:

Table 69: the animacy of the landmark (*next to*)

NEXT TO: THE ANIMACY OF THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE LANDMARK	565
INANIMATE LANDMARK	435
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the LM in the sample, in 565 occurrences, there was an animate LM. In 435 occurrences, there was an inanimate LM.

In table 70, the animacy of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 70: the animacy of the trajector and the landmark (*next to*)

NEXT TO: THE ANIMACY OF THE TRAJECTOR AND THE LANDMARK	
Semantic value	**Number of tokens**
ANIMATE TRAJECTOR AND ANIMATE LANDMARK	510
ANIMATE TRAJECTOR AND INANIMATE LANDMARK	185
INANIMATE TRAJECTOR AND INANIMATE LANDMARK	250
INANIMATE TRAJECTOR AND ANIMATE LANDMARK	55
TOTAL	1,000

The table indicates that out of the 1,000 instances of the animacy of the TR and the LM in the sample, 510 instances showed an animate TR and LM, 185 instances showed an animate TR and an inanimate LM, 250 instances showed an inanimate TR and LM. Finally, 55 instances showed an inanimate TR and animate LM. Thus, the predominant value is animate TR and LM.

5.15. Animacy: Animate trajector and animate landmark

[5.15] At least, not what anyone who knows about money would call money. Lend us a quid.' That was the first thing he ever said to me. We were sitting **next to** one another in class. We were fifteen. *(BNC. Talking it over. Barnes, Julian. London: Pan Books Ltd, 1992, pp. 1-128).* (Next to- 415).

Dimension: dynamics, sequence, we were sitting.
Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. No Motion.
TR- we, animate.
LM- one another, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker (we) and trajector (we).
Mutual attention: TR active and LM active.

5.16. Animacy: Animate trajector and inanimate landmark

[5.16] He sat her down **next to** the piano, and tinkled out an arpeggio to announce the performance. She straightened, took up a position at his side, adjusted her feet in a v like a ballerina in first Position and, holding out the panels of her skirt, nodded to him to begin. *(BNC. The lost father. Warner, Marina. London: Picador, 1989, pp. 42-126).* (Next to-691).

Dimension: dynamics, sequence, he sat her down. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. No Motion.
TR- he, animate. LM- the piano, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. No mutual attention: TR active and LM passive.

5.17. Animacy: Inanimate trajector and inanimate landmark

[5.17] This may include placing new titles in prime positions by the till -- in the way that sweets are put **next to** supermarket checkouts. Publishers are also being invited to pay for four or five copies of a magazine to be lined up against each other along a shelf, so the title appears to be a fast seller. *(BNC. Independent, elect. Newspaper, 1994).* (Next to-43).

Dimension: dynamics, movement, to put sweets. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. Motion.

TR- the sweets, inanimate.
LM- the supermarket checkouts (payment counter), inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. No mutual attention: TR passive and LM passive.

5.18. Animacy: Inanimate trajector and animate landmark

[5.18] Tina would have plumped herself down in the nearest seat even if this had been **next to** a passenger but Cecilia, conforming to usage, sat in the emptiest area of the coach, on the platform side with her back to the window. *(BNC. King Solomon's carpet. Vine, Barbara. London: Penguin Group, 1992, pp. 1-122).* (Next to- 424).

Dimension: dynamics, sequence, Tina would have plumped down (drop) in the nearest seat. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. No Motion.
TR- the nearest seat, inanimate.
LM- a passenger, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. No mutual attention: TR passive and LM active.

In table 71, the relative size of the TR and the LM is, in each case, indicated for the total of 1,000 examples:

Table 71: the relative size of *next to*

NEXT TO: RELATIVE SIZE	
Semantic value	**Number of tokens**
TR=LM	204
TR>LM	345
TR<LM	451
TOTAL	1,000

The table indicates that out of the 1,000 instances of the relative size for the TR and the LM in the sample, 204 instances showed an equal size for the TR and the LM (TR=LM), 345 instances showed the bigger TR than the LM (TR>LM), and 451 instances showed the smaller TR than the LM (TR<LM). Thus, the predominant and frequent value is, in this case, TR<LM.

5.19. Relative size: TR=LM

[5.19] She had not even spoken much, leaving the explanations to Keith and Jinny. She had just sat still, **next to** Bella, and stared at Joe, with fierce, desperate eyes. Joe tapped his fingertips together and looked from face to face. *(BNC. On the edge. Cross, Gillian. Oxford: OUP, 1989, pp. 66-170).* (Next to- 202).

Dimension: dynamics, sequence, to sit next to Bella. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. No Motion.
TR- she, animate. LM- Bella, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

5.20. Relative size: TR>LM

[5.20] One summer evening as darkness fell thousands of sparrows arrived and settled on two houses **next to** me. Can you explain? They were not sparrows in such numbers but could be house martins, which settle on west-facing houses to bask in the setting sun. *(BNC. The Daily Mirror. London: Mirror Group Newspapers, 1992).* (Next to-6).

Dimension: dynamics and topology, movement and proximity, thousands of sparrows (birds/gorrión is in Spanish) on two houses. Lateral orientation.
Frame of reference: intrinsic (the lateral side of the landmark).
Schema: following the trajectory. Horizontal axis. Motion.
TR- Thousands of sparrows on two houses, animate.
LM- me (I), animate.
Unequal relative size: TR>LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker (I) and landmark (I).
No mutual attention: TR active and LM active.

5.21. Relative size: TR<LM

[5.21] The next evening was dark and cloudy; a storm threatened and already the first drops of rain were falling. Mr and Mrs Bumble walked up the main street of the town, then turned towards a group of ruined old houses **next to** the river. *(BNC. Oliver Twist: Oxford Bookworms edition. Rogers, Richard and Dickens, Charles. Oxford: OUP, 1992, pp. 1-102).* (Next to-559).

Dimension: dynamics, movement, Mrs Bumble turned towards a group of ruined old houses; lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. Motion.

TR- a group of ruined old houses, inanimate.
LM- the river, animate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. No mutual attention: TR passive and LM passive.

In table 72, the image schemas of the TR and the LM are classified for a total of 1,000 examples (see section 4.5):

Table 72: the image schemas of *next to*

NEXT TO: IMAGE SCHEMAS	
Semantic value	**Number of tokens**
TOPOLOGY SCHEMA: SEQUENCE (CONTIGUOUS)	459
SPATIAL SCHEMA: LINEAR ORDER	400
SPATIAL SCHEMA: FOLLOWING A TRAJECTORY	141
TOTAL	1,000

The table indicates that out of the 1,000 instances, the topology schema of sequence was interpreted in 459 instances, the TR and the LM being in a contiguous position. The spatial schema of linear order, the TR, the LM and other entities being in order, was interpreted in 400 instances. The spatial schema of following a trajectory, being a path described by an entity moving, was analysed in 400 instances. The predominant schema is the topology schema of sequence.

5.22. Image schema: Linear order

[5.22] She was seated **next to** the Queen and Duke of Edinburgh on the head table while Prince Charles was relegated to a side table. His view of the Queen was obscured by his father's back. *(BNC. Newspaper Today, 1994).* (Next to-85).

Dimension: dynamics, sequence (the protocol, the correct procedure in a linear order concerning other guests).
Frame of reference: intrinsic.
Schema: linear order. Horizontal axis.
The image schema of linear order refers to several entities located in order, and the possible dimensions are topology or dynamics.
TR- she, animate.
LM- the Queen and Duke of Edinburgh, animate.
Unequal relative size: TR<LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

5.23. Image schema: Following the trajectory

[5.23] **Next to** Perdita rode Mike Waterlane on Dopey, a deceptively sleepy-looking pony, who was faster than a Ferrari and nipped all the opposition ponies in the line-out. *(BNC. Polo. Cooper, Jilly. London: Bantam (Corgi), 1991, pp. 162-267).* (Next to-331).

Dimension: dynamics, movement, Mike rode next to Perdita. Lateral orientation.
Frame of reference: intrinsic.
Schema: following the trajectory (the path described by an entity moving).
TR- Mike, animate. LM- Perdita, animate.
Equal relative size: TR=LM.
TR and LM are in the same position, symmetry.
Vantage point: speaker. Mutual attention: TR active and LM active.

5.24. Image schemas: Sequence

[5.24] He locked the door of the room carefully. He didn't put the key in his pocket, but hid it in the plant pot **next to** the door. *(BNC. Dead Man's Island: Oxford Bookworms edition. Escott, John. Oxford: OUP, 1992, pp. 1-39).* (Next to-502).

Dimension: dynamics, movement, he hid the key in the plant pot; lateral orientation.
Frame of reference: intrinsic.
Schema: sequence (the plant pot is contiguous to the door). Horizontal axis.
The image of sequence refers to an entity located next to another entity in a series.
There is an intentionality to be in a sequence. There are no other entities apart from a TR and LM.
TR- the key in the plant pot, inanimate.
LM- the door, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: speaker. No mutual attention: TR passive and LM passive.

5.25. Vantage point: A speaker (I) and a trajector (I) are the same

[5.25] I was seated **next to** Professor St John Goth, as I had been on the previous night; Dominic and Lee were opposite, and Mr and Mrs Maclean from Stirling were on my right. The boys seemed very cheerful. *(BNC. Black justice. Shepherd, Stella. London: Constable & Company Ltd, 1988, pp. 17-132).* (Next to-312).

Dimension: dynamics, sequence (to seat next to someone).
Frame of reference: intrinsic (lateral side).
Schema: following the trajectory. Horizontal axis. No Motion.
TR- I, animate.
LM- Professor St John Goth, animate.
Equal relative size: TR=LM.

TR and LM are in the same position, symmetry.
Vantage point: speaker (I) and trajector (I) are the same.
Mutual attention: TR active and LM active.

5.26. Vantage point: A speaker is different from a trajector

[5.26] Tom pointed to a low round cushiony type of seat, **next to** the armchair. Willie squatted down in front of the shelves and chose three books. He pulled out the pouffe and sat on it with them propped on his knees. *(BNC. Goodnight Mister Tom. Magorian, Michelle. Harmondsworth: Puffin, 1983, pp. 22-156).* (Next to-338).

Dimension: dynamics, sequence, Tom pointed to a low round cushiony seat.
Frame of reference: intrinsic.
Schema: following the trajectory. Horizontal axis. Motion.
TR- a low round cushiony type of seat, inanimate.
LM- the armchair, inanimate.
Unequal relative size: TR<LM.
TR and LM are not in the same position, asymmetry.
Vantage point: a speaker is different from a trajector.
No mutual attention: TR passive and LM passive.

Chapter 8: Discussion

In this chapter, I discuss the principal results obtained. This discussion involves a detailed reflection to show the semantic contrast of the variation and the frequency of each parameter in a comparative study of the findings concerning the prepositions *at, beside, by, near* and *next to*. After analysing the corpus, the following discussion serves to accomplish the objectives of this study. Some relevant aspects about the grammatical description and semantic elements are suggested for reflection. Finally, I propose some suggestions for future research.

The present study focuses on the semantic and spatial relations expressed by a small set of prepositions. It holds, after considering the literature on *at, beside, by, near* and *next to* (Navarro i Ferrando, 1998, 2001, 2006a; Silvestre-López, 2009), the dimensions of topology, dynamics and function to be of equal importance; not only because of the need to consider them but also to show the specific meaning of the prepositions analysed, namely *at, beside, by, near* and *next to.* These dimensions are necessary because they allow for a comprehensive description of the meanings of spatial relations. In interpreting each context from the BNC corpus, in most cases, one of these dimensions mentioned above may be understood as being the most prominent one for the preposition used and for the particular context.

The functional dimension has its origins in a bodily experience, interaction or movements. Thus, a preposition may focus on a particular functional relation between the entities of TR and LM, such as keeping control, operation, support or intentionality, among others. In the same context, however, using a different preposition would focus on a topological or dynamic dimension.

The context is the most relevant aspect to consider for interpreting a preposition's meaning and determining the most prominent dimension. Moreover, the interpretation and the functional relations are also relevant for selecting the proper preposition in each context.

8.1 The semantic characteristics of *at*

According to the frequencies obtained, the predominant parameters of the preposition *at* are the following:

- Topology: The predominant value is coincidence.
- Dynamics: The predominant value is movement (TR moves forwards).
- Function: The predominant value is operation/management.
- Intentionality (function): The predominant values are no mutual attention, active TR and passive LM.
- Intentionality (dynamics): The predominant values are no mutual attention, active TR and passive LM.
- Frame of reference: The predominant value is intrinsic.
- Relative position of TR and LM: The predominant value is asymmetry.

- Animacy: The predominant value is animate TR and inanimate LM.
- Relative size: The predominant value is TR<LM.
- Image schema: The predominant value is force group, enablement (access).

As a consequence of these results, the primary sense of the preposition *at* expresses a series of characteristics: A coincidence between a TR and an LM; a movement in which a TR moves toward the front of an LM; an operation/management in which a TR operates an LM; no mutual attention (interaction) between an active TR and a passive LM because of dynamics and function parameters; an intrinsic frame of reference; an asymmetrical position of the entities; an animate TR and an inanimate LM in a scene; a TR smaller than an LM (TR<LM); and a schema of the force group (enablement: Access).

A hypothesis is a provisional idea or explanation requiring evaluation. It is a crucial component of the scientific method. Every scientific study, whether experimental or descriptive, begins with a hypothesis that the investigation is designed to test; that is, depending on the study's results, the hypothesis will be either confirmed or disconfirmed.

In the following, I address the research questions considering each parameter for *at*:

In the topology dimension, the predominant value is coincidence with 11% out of 20,3%. Then, the hypothesis is partially confirmed since coincidence is the most frequent value, and reference point is the second most frequent value with 6%. The difference between these two values is only 5%.

In the dimension of dynamics, the predominant value is movement forwards with 16,4%. Then, the hypothesis is accomplished with a movement and a frontal position of a TR.

In the function dimension, the predominant value is operation/management with 18,8%. Therefore, the hypothesis concerning *at* that points to usage or manipulation of the LM is related to the prevailing value of this analysis. The data supports a hypothesis that is barely supported by this percentage.

In the parameter of intentionality (in the dimension of function), the predominant values are no mutual attention (40,3% out of 56,6%), active TR (47,6% out of 56,6%) and passive LM (32,2% out of 56,6%). Therefore, the hypothesis is corroborated, given that there is no mutual attention between the TR and the LM.

In the parameter of intentionality (in the dimension of dynamics), the predominant values are no mutual attention (15,9% out of 23,1%), active TR (19,5% out of 23,1%) and passive LM (14,6% out of 23,1%). Consequently, the hypothesis is confirmed with no mutual attention between the TR and the LM.

In the parameter of frame of reference, the predominant value is the intrinsic frame (65,3%). Therefore, the intrinsic frame confirms the hypothesis to a large extent.

In the parameter of relative position, the predominant value is asymmetry with 76%. Then, the hypothesis is proved mainly with the asymmetry position.

In the parameter of the animacy of the TR and the LM, the predominant value is animate TR and inanimate LM with 55,1%. Then, the hypothesis is partially confirmed with an animate TR and an inanimate LM (as a reference point).

In the relative size parameter, the predominant value is the TR smaller than the LM as in TR<LM with 84,6%. Then, the hypothesis is confirmed by the TR being smaller than the LM (TR<LM) in most uses.

In the parameter of image schema, the predominant value is a force group, enablement (access), with 38,6%. The hypothesis concerning *at* that points to any of the three groups of image schemas shows a force group, according to the final results of the data.

8.2 The semantic characteristics of *beside*

The predominant values of *beside*:

- Topology: The predominant value is proximity.
- Dynamics: The predominant value is movement (TR moves along the lateral side of LM).
- Function: The predominant value is alliance (synergy-reciprocal effect).
- Intentionality (function): The predominant values are no mutual attention, active TR and passive LM.
- Intentionality (dynamics): The predominant values are mutual attention, active TR and active LM.
- Frame of reference: The predominant value is intrinsic.
- Relative position of TR and LM: The predominant value is asymmetry.
- Animacy: The predominant value is animate TR and animate LM.
- Relative size: The predominant value is TR<LM.
- Image schema: The predominant value is topology group, centre-periphery.

As a consequence of these results, the evidence shows that the primary sense of the preposition *beside* expresses a series of characteristics: A proximity between a TR and an LM; a movement in which a TR moves along the lateral side of an LM; an alliance (synergy or reciprocal effect) between a TR and an LM; no mutual attention (interaction) between an active TR and a passive LM because of a function parameter; mutual attention (interaction) between an active TR and an active LM because of a dynamic parameter; an intrinsic frame of reference; an asymmetrical position; an animate TR and an animate LM in a scene; a TR smaller than an LM (TR<LM); and a schema of the topology group (centre-periphery).

According to the analysis of the preposition *beside*, the data shows the predominant values and the answers to questions in each parameter for *beside* in order to prove that the hypotheses are barely, partially or satisfactorily completed:

In the topology dimension, the predominant value is proximity with 26%. Therefore, the data support the hypothesis that the preposition expresses proximity. The frequency is satisfactorily supported compared to the other value of contiguity (2,7%).

In the dimension of dynamics, the predominant value is movement along the lateral side of an LM (32,3% out of 48,8%). Compared with the other value of lateral orientation (16,3%), it is primary. Then, the hypothesis is partially confirmed with a movement by/along the side of an LM.

In the function dimension, within the classification of values, the predominant value is alliance (synergy/reciprocal effect) with 16,7%. Then, although the hypothesis of *beside* points to accessibility or an interaction value, the data shows cooperation (synergy/reciprocal effect) between a TR and an LM.

In the parameter of intentionality (in the dimension of function), the predominant values are no mutual attention (15,2% out of 22,5%), active TR (16,9% out of 22,5%) and passive LM (12,1% out of 22,5%). Then, the hypothesis is satisfactorily supported with no mutual attention between the TR and the LM and with an active TR and a passive LM.

In the parameter of intentionality (in the dimension of dynamics), the predominant values are no mutual attention (26,1% out of 48,8%), active TR (42,5% out of 48,8%) and active LM (31,2% out of 48,8%). Then, the hypothesis is partially completed with no mutual attention between the TR and the LM and with an active TR, but a passive LM is not proved in the majority of examples, as the data shows.

In the parameter of frame of reference, the predominant value is the intrinsic frame (76,9%). Then, to a large extent, the hypothesis is confirmed, being the intrinsic frame about the side of the LM a very entrenched feature in linguistic usage.

In the parameter of relative position, the predominant value is asymmetry with 57,7%. Therefore, the hypothesis is partially supported by the asymmetry position. This indicates that the TR and the LM are in an asymmetrical position for *beside*.

In the parameter of the animacy of the TR and the LM, the predominant value is a scene with an animate TR and an animate LM with 42,6%. Then, the hypothesis is partially completed because of an animate TR but is not supported with an inanimate LM, as the data suggests.

In the relative size parameter, the predominant value is the TR smaller than the LM as in TR<LM with 60,1%. Then, the hypothesis is confirmed.

In the parameter of image schema, the predominant value is a topology group, centre-periphery with 52,4%. The hypothesis of *beside* points to a topology group, and the final results show the same image schema.

8.3 The semantic characteristics of *by*

The predominant value of *by* in the analysed parameters:

- Topology: The predominant value is proximity.
- Dynamics: The predominant value is movement (TR moves along the side of LM/passing proximally to LM).
- Function: The predominant value is realisation.
- Intentionality (function): The predominant values are no mutual attention, active TR and active LM.
- Intentionality (dynamics): The predominant values are no mutual attention, active TR and active LM.
- Frame of reference: The predominant value is relative.
- Relative position of TR and LM: The predominant value is asymmetry.
- Animacy: The predominant value is animate TR and animate LM.
- Relative size: The predominant value is TR<LM.
- Image schema: The predominant value is spatial group, passive voice and agent.

As a consequence of the results obtained, the primary sense of the preposition *by* includes a series of semantic attributes: A proximity between a TR and an LM; a movement in which a TR moves along the side of an LM/passing proximally to an LM; a realisation between a TR and an LM; no mutual attention (interaction) between an active TR and an active LM, given a function and a dynamic parameter; a relative frame of reference; an asymmetrical position; an animate TR and an animate LM; a TR smaller than an LM (TR<LM); and a spatial schema of passive voice and agent.

Regarding the research questions in each parameter for *by*:

According to the analysis of the corresponding parameters of the preposition *by*, the data shows the following predominant values:

In the topology dimension, the predominant value is proximity with 2,1% out of 2,9% over contact with 0,6%. The data satisfactorily supports the hypothesis that the preposition expresses the spatial relationship of proximity.

In the dimension of dynamics, the predominant value is motion (along the side of the LM or passing proximally to the LM) with 12,8%. Then, the hypothesis is entirely supported with a movement facing the side or next to the side of the LM without stopping or with an intermediate stop.

In the function dimension, the predominant value is realisation with 47,5%. Then, the hypothesis that points to a grammatical construction where *by* means the agency value is supported by its high percentage of occurrence in most of the cases, but the agency value is not included in this analysis of the dimension of function. In the spatial senses, the LM is a creator of the action in most cases. It is partially proved with the value of realisation (47,5% out of 84%).

In the parameter of intentionality (in the dimension of function), the predominant values are no mutual attention (46,9% out of 84%), active TR (62,8% out of 84%) and active LM (69,9% out of 84%). An active TR is always in active sentences, and an active LM is always in passive sentences due to the agent participant following the preposition. Then, the hypothesis is confirmed with no mutual attention between the TR and the LM (an active LM), but it is not confirmed with a passive TR.

In the parameter of intentionality (in the dimension of dynamics), the predominant values are no mutual attention (6,8% out of 12,8%), active TR (9,9% out of 12,8%) and active LM (7,5% out of 12,8%). An active TR is always in active sentences, and an active LM is always in passive sentences due to the acting agent. Then, the hypothesis is confirmed with no mutual attention between the TR and the LM (an active LM), but it is not confirmed with a passive TR.

In the parameter of frame of reference, the predominant value is the relative frame (59%) formulated with sentences in passive voice. In contrast, most active voice sentences are in the intrinsic frame. Then, the hypothesis is partially proved by the relative frame.

In the parameter of relative position, the predominant value is asymmetry with 73,8%. The meaning of *by* entails a TR and an LM in an asymmetrical position. Then, the hypothesis is satisfactorily proved with the asymmetrical position.

In the parameter of the animacy of the TR and the LM, the predominant value is animate TR and animate LM with 58,6%. Then, the hypothesis is not supported with an inanimate TR, but it is partially confirmed with an animate LM. It implies that the meaning of *by* is, to some extent, related to an animate TR and LM.

In the relative size parameter, the predominant value is the TR smaller than the LM as in TR<LM with 53,8%. Then, the hypothesis is not accomplished with the bigger TR than the LM as in TR>LM.

In the parameter of image schema, the predominant value is a spatial schema of passive voice and agent with 92,4%. Then, the hypothesis is confirmed with spatial schema, but not with a force schema.

8.4 The semantic characteristics of *near*

The predominant values of *near*:

- Topology: The predominant value is proximity.
- Dynamics: The predominant value is movement (TR moves to a relative orientation/undetermined axis).
- Function: The predominant value is accessibility.
- Intentionality (function): The predominant values are no mutual attention, active TR and passive LM.

- Intentionality (dynamics): The predominant values are no mutual attention, active TR and passive LM.
- Frame of reference: The predominant value is relative.
- Relative position of TR and LM: The predominant value is asymmetry.
- Animacy: The predominant value is animate TR and inanimate LM.
- Relative size: The predominant value is TR<LM.
- Image schema: The predominant value is topology schema, near-far (without a central point).

As a consequence of these results, the primary sense of the preposition *near* shows a set of characteristics: A proximity between a TR and an LM; a movement in which a TR moves to a relative orientation/undetermined axis; accessibility between a TR and an LM; no mutual attention (interaction) between an active TR and a passive LM; a relative frame of reference; an asymmetrical position; an animate TR and an inanimate LM; a TR smaller than an LM (TR<LM); a topology schema (near-far: without a central point).

According to the analysis of the preposition *near*, the data shows that the predominant values are the following:

In the topology dimension, the predominant value is proximity with 19,6% out of 19,6%. Then, the hypothesis is satisfactorily completed with proximity but not with contiguity (in the vicinity).

In the dimension of dynamics, the predominant value is motion to a relative orientation/undetermined axis with 20,4%. Then, the hypothesis also suggests an undetermined axis, but considering motion to the sides of an LM, the data shows no motion to the sides of an LM because of relative orientation.

In the function dimension, the predominant value is accessibility with 41,6%. The hypothesis of *near* points to an interaction between the TR and LM. However, the data suggests accessibility between the TR and the LM rather than interaction.

In the parameter of intentionality (in the dimension of function), the predominant values are no mutual attention (58,5% out of 59,5%), active TR (56,2% out of 59,5%) and passive LM (57,1% out of 59,5%). The hypothesis points to the possibility that there is no mutual attention between the TR and the LM, an active TR and a passive LM. The hypothesis is satisfactorily confirmed within the examples of function.

In the parameter of intentionality (in the dimension of dynamics), the predominant values are no mutual attention (19,3% out of 20,4%), active TR (18,1% out of 20,4%) and passive LM (18,7% out of 20,4%). The hypothesis proposes that there is no mutual attention between the TR and the LM, an active TR and a passive LM. The hypothesis is satisfactorily confirmed within the examples of dynamics.

In the parameter of frame of reference, the predominant value is the relative frame (88,1%). Then, the hypothesis is disconfirmed with the intrinsic frame of reference by focusing on a relative nearness and orientation instead of a lateral orientation.

In the parameter of relative position, the predominant value is asymmetry with 97,8%. Then, the hypothesis is not completed with the symmetry position. The meaning of *near* implies a TR and an LM in an asymmetrical position.

In the parameter of the animacy of the TR and the LM, the predominant value is animate TR and inanimate LM with 73,2%. Then, as an option that the hypothesis proposes, there is an animate TR and an inanimate LM, as the data suggests. In most cases, it is confirmed, and the meaning of *near* implies a scene with an animate TR and an inanimate LM.

In the relative size parameter, the predominant value is the TR smaller than the LM as in TR<LM with 95,2%. Then, the hypothesis concludes the same value as in TR<LM.

In the parameter of image schema, the predominant value is a topology group, near-far (without a central point) with 99,2%. Then, the hypothesis of *near* points to a possible topology group and the final results of the data shows the same image schema, concretely, near-far.

8.5 The semantic characteristics of *next to*

The predominant values of *next to*:

- Topology: The predominant value is contiguity.
- Dynamics: The predominant value is sequence.
- Function: The predominant value is interaction (sequential organisation).
- Intentionality (function): The predominant values are no mutual attention, active TR and active LM.
- Intentionality (dynamics): The predominant values are mutual attention, active TR and active LM.
- Frame of reference: The predominant value is intrinsic.
- Relative position of TR and LM: The predominant value is symmetry.
- Animacy: The predominant value is animate TR and animate LM.
- Relative size: The predominant value is TR<LM.
- Image schema: The predominant value is topology schema, sequence.

These results indicate that the primary sense of the preposition *next to* can be characterised as follows: A contiguity between a TR and an LM; a movement in which a TR and an LM are in a sequence; an interaction (sequential organisation) between a TR and an LM; no mutual attention (interaction) between an active TR and an active LM in view of a function parameter; mutual attention (interaction) between an active TR and an active LM in view of a dynamic parameter; an intrinsic frame of reference; a symmetrical position; an animate TR and an animate LM; a TR smaller than an LM (TR<LM); a topology schema (sequence).

According to the analysis of the preposition *next to*, the data shows that the predominant values are the following:

In the topology dimension, the predominant value is contiguity with 18,9% out of 28,7%. To a large extent, the hypothesis is proved with contiguity (with little or no space between TR and LM).

In the dimension of dynamics, the predominant value is sequence with 40,8%. Then, according to the hypothesis, the movement is towards the lateral side of an LM, and the TR is placed in a sequence.

In the function dimension, the predominant value is interaction (sequential organisation) with 16,8% out of 18,4%. The function hypothesis for *next to* indicates the same value as a sequential organisation or position between the TR and LM.

In the parameter of intentionality (in the dimension of function), the predominant values are no mutual attention (14,1% out of 18,4%), active TR (12,2% out of 18,4%) and active LM (9,4% out of 18,4%). The hypothesis points to the possibility that there is no mutual attention between the TR and the LM, an active TR and an active LM. The meaning of *next to* implies a scene with an active TR and LM but not necessarily having mutual attention within the functional pattern.

In the parameter of intentionality (in the dimension of dynamics), the predominant values are mutual attention (33,3% out of 52,9%), active TR (45,8% out of 52,9%) and active LM (36,8% out of 52,9%). The hypothesis proposes that there is mutual attention between the TR and the LM, an active TR and an active LM. The meaning of *next to* implies a scene with an active TR and LM, and they have mutual attention within the dynamics pattern in most of the examples.

In the parameter of frame of reference, the predominant value is the intrinsic frame (93,8%). The hypothesis is confirmed since the intrinsic frame is pervasive due to the position of the TR contiguous to the lateral side of an LM.

In the parameter of relative position, the predominant value is symmetry with 52,6%. Then, the hypothesis is partially supported with the symmetry position as one of the possibilities.

In the parameter of the animacy of the TR and the LM, the predominant value is animate TR and animate LM with 51%. Then, as an option that the hypothesis proposes, there is an animate TR and LM as the data suggests. The hypothesis is partially confirmed.

In the relative size parameter, the predominant value is the TR smaller than the LM as in TR<LM with 45,1%. Among the three options, the hypothesis is proved to a minor extent as it has a higher frequency than 34,5% in TR>LM.

In the parameter of image schema, the predominant value is a topology group, sequence with 45,9%. The hypothesis of *next to* points to a possible topology group, the centre-periphery (near-far). However, the data shows a different image schema of topology, concretely, sequence (contiguous). Since there is no schema of this structure and characteristics in the previous literature, I propose a new schema of sequence (contiguous), which represents a pattern of interaction where a succession of elements is consecutive to one another.

Table 73. Semantic parameters defining prepositions and their predominant values for *at*, *beside*, *by*, *near* and *next to*.

Parameters	**AT**	**BESIDE**	**BY**	**NEAR**	**NEXT TO**
Topology	Coincidence[5] 11%	Proximity 26%	Proximity 2,1%	Proximity 19,6%	Contiguity 18,9%
Dynamics	Movement forwards 16,4%	Movement along the lateral side of LM 32,3%	Movement (along the side of LM/ passing proximally to LM) 12,8%	Movement (to a relative orientation/ undetermined axis) 20,4%	Sequence 40,8%
Function	Operation/ management 18,8%	Alliance (synergy-reciprocal effect) 16,7%	Realisation 47,5 %	Accessibility 41,6%	Interaction (sequential organisation) 16,8%
The predominant dimension	Function 56,6%	Dynamics 48,8%	Function 84%	Function 59,5%	Dynamics 52,9%
Intentionality (function)	No mutual attention (40,3%), active TR (47,6%) and passive LM (32,2%)	No mutual attention (15,2%), active TR (16,9%) and passive LM (12,1%)	No mutual attention (46,9%), active TR (62,8) and active LM (69,9%)	No mutual attention (58,5%), active TR (56,2%) and passive LM (57,1%)	No mutual attention (14,1%), active TR (12,2%) and active LM (94%)
Intentionality (dynamics)	No mutual attention (15,9%), active TR	Mutual attention (26,1%), active TR	No mutual attention (68%), active TR	No mutual attention (19,3%), active TR	Mutual attention (33,3%): active TR

[5] The results of the predominant values are converted to percentages from the thousand instances in a sample.

	(19,5%) and passive LM (14,6%)	(42,5%) and active LM (31,2%)	(99%) and active LM (75%)	(18,1%) and passive LM (18,7%)	(45,8%) and active LM (36,8%)
Frame of reference	Intrinsic 65,3%	Intrinsic 76,9%	Relative 59%	Relative 88,1%	Intrinsic 93,8%
Relative position	Asymmetry 76%	Asymmetry 57,7%	Asymmetry 73,8%	Asymmetry 97,8%	Symmetry 52,6%
The animacy of TR and LM	Animate TR and inanimate LM 55,1%	Animate TR and animate LM 42,6%	Animate TR and animate LM 58,6%	Animate TR and inanimate LM 73,2%	Animate TR and animate LM 51%
Relative size	TR<LM 84,6%	TR<LM 60,1%	TR<LM 53,8%	TR<LM 95,2%	TR<LM 45,1%
Image schema	Force group: enablement (access) 38,6%	Topology group: centre-periphery 52,4%	Passive voice and agent 92,4%	Topology group: near-far (without a central point) 99,2%	Topology group: sequence 45,9%

Table 73 shows the parameters, their predominant values and the primary senses within the five prepositions of this study. To a certain degree, this study adds valuable information about each preposition's meaning and use. The hypotheses that are not confirmed, including the values, are as follows:

In the function for *at*, the predominant value is operation/management. The hypothesis is barely supported with 18,8% out of 56,6%.

In the animacy for *at*, the predominant value is animate TR and inanimate LM, with 55,1%. The hypothesis is partially confirmed with an animate TR and an inanimate LM (as a reference point).

In short, the percentages of *at* are not high for the predominant value of operation/management (function) and are predominant for an animate TR and inanimate LM (animacy).

In the function for *beside*, the predominant value is alliance (synergy/reciprocal effect) with 16,7% out of 22,5%. The hypothesis points to accessibility or an interaction value, but the data shows alliance (synergy/reciprocal effect) between a TR and an LM to be predominant.

In the intentionality for *beside* (in the dimension of dynamics), the predominant values are no mutual attention (26,1% out of 48,8%), active TR (42,5% out of 48,8%) and

active LM (31,2% out of 48,8%). Then, as the data shows, a passive LM is not proved in most examples.

In the animacy for *beside*, the data suggests the predominant value is an animate TR and LM with 42,6%. As the data suggests, the hypothesis is not supported with an inanimate LM.

In short, the predominant value of *beside* is alliance (synergy/reciprocal effect) for the parameter of function instead of accessibility or an interaction value. A passive LM is not proved in most examples, as the data shows for the intentionality of dynamics. In animacy, the hypothesis is not supported by sufficient evidence to confirm an inanimate LM.

In the intentionality (in the dimension of function for *by*), the predominant values are no mutual attention (46,9% out of 84%), active TR (62,8% out of 84%) and active LM (69,9% out of 84%). The hypothesis is not confirmed with a passive TR.

In the intentionality (in the dimension of dynamics for *by*), the predominant values are no mutual attention (6,8% out of 12,8%), active TR (9,9% out of 12,8%) and active LM (7,5% out of 12,8%). The hypothesis is not confirmed with a passive TR.

The predominant value is animate TR and animate LM with 58,6% in the animacy of the TR and the LM for *by*. The hypothesis is not supported with an inanimate TR.

In short, the intentionality (in the function and dynamics of *by*) is not confirmed with a passive TR. Regarding animacy, the hypothesis is not supported by sufficient evidence to confirm an inanimate TR.

The predominant value in the function for *near* is accessibility with 41,6%. The hypothesis of *near* points to interaction; however, the data suggests accessibility between the TR and the LM rather than interaction.

In the frame of reference for *near*, the predominant value is the relative frame (88,1%). The hypothesis is unconfirmed with the intrinsic frame of reference by focusing on a relative nearness and orientation instead of a lateral orientation.

The predominant value is asymmetry with 97,8% in the relative position for *near*. The meaning of *near* implies a TR and an LM in an asymmetrical position. The hypothesis is not proved with the symmetrical position.

In short, the data suggests accessibility (function) rather than interaction. The hypothesis is unconfirmed with the intrinsic frame of reference. The hypothesis is not confirmed when there is a symmetrical position.

In the relative size for *next to*, the predominant value is the TR smaller than the LM as in TR<LM with 45,1%. Among the three options, the hypothesis is proved to a minor extent as it has a higher frequency than 34,5% in TR>LM.

In the image schema for *next to*, the hypothesis of *next to* points to a possible topology group, the centre-periphery (near-far). The data shows a different image schema of topology, concretely, sequence (contiguous) with 45,9%. Since there is no schema of these characteristics in the previous literature, I propose a new schema of sequence (contiguous).

In short, the percentage is not high for TR<LM as a predominant size. In image schema, the predominant value is a topology group, a new schema of sequence (contiguous).

After a review of the unconfirmed hypotheses, it is observed that the functional pattern, the intentionality, the animacy and the image schema have variations in comparison with the results. Interestingly, comparisons of the five prepositions (*at, beside, by, near* and *next to*) are presented in percentages (see table 73):

Comparing the parameters and the predominant values (i.e. the primary senses) of the five prepositions explains why it is relevant to understand the meaning of a preposition to use it in a proper context. This approach is compatible with the prototype approach: a model or exemplar on which certain qualities characterise an entity (a word in this case).

Table 73 above shows the predominant values of the five prepositions expressed as percentages on each sample of 1,000 instances from the BNC. In the following paragraphs, I present a reflection about the number of cases and the differences between values across prepositions:

In the parameter of topology, there is evidence of the predominant value of proximity in *beside* (26%), *by* (2,1%) and *near* (19,6%). The highest number is 26% in the case of *beside*, and the lowest number is 2,1% in the case of *by*. In the case of *at* it is coincidence (11%) and in the case of *next to* it is contiguity (18,9%).

When a speaker describes a situation of proximity implies the meanings of *beside* and *near*. A situation of contiguity suggests the meaning of *next to* and a coincidence the meaning of *at.* These two prepositions have more uses and frequencies for proximity than others have.

In the parameter of dynamics, it can be seen in table 73 that the predominant value is movement in the case of *at* (16,4%), *beside* (32,3%), *by* (12,8%) and *near* (20,4%). There is a significant difference in the type of movement, for *at* it is a movement forwards (to what is in front), for *beside* it is a movement along the lateral side of LM, for *by* it is a movement along the side of LM/passing proximally to LM without stopping or there being an intermediate stop. For *near*, it is a movement to a relative orientation/undetermined axis without a specification of a side, a front or a back part. Compared to the other prepositions, the highest figure of this parameter is the predominant value of sequence for *next to* (40,8%) in reference to a contiguous location. Another value of *next to* is the motion to a lateral orientation, with fewer results (12,1%) (see table 73).

With regard to the highest percentages, this indicates that choosing the preposition *next to* implies a high frequency for a movement to a contiguous location versus *beside* that implies a high frequency for a movement along the lateral side of LM. These two prepositions have more uses and frequencies for movement than others have.

In the function parameter, the table illustrates the predominant values with different meanings in each one. The value of operation/management for *at* (18,8%), the value of alliance (synergy-reciprocal effect) for *beside* (16,7%), the value of realisation for *by* (47,5%), the value of accessibility for *near* (41,6%) and the value of interaction (sequential organisation) for *next to* (16,8%). In this parameter of function, the highest number is 47,5% in the value of realisation for *by*. The lowest figure is 16,7% in the value of alliance (synergy-reciprocal effect) for *beside*.

With regard to the highest percentages, this indicates that choosing the prepositions *by* and *near* implies a high frequency of the meaning of function. These two prepositions have more uses and frequencies for a functional pattern (realisation or accessibility) than others have.

As can be seen from the table above, there are three perceptual dimension parameters: topology, dynamics, and function. There is evidence that the predominant perceptual dimension is function in three prepositions, namely *at* (56,6%), *by* (84%) and *near* (59,5%). The highest number is 84% for *by*, and with *at* and *near*, the results are similar. In contrast, the predominant dimension is dynamics for *beside* (48,8%) and *next to* (52,9%).

In comparison with the highest percentages, it indicates that choosing the prepositions *by*, *near* and *at* (in the same order of high frequencies) entails more uses of function than others do.

The possibilities of intentionality are: 1) no mutual attention between an active TR and a passive LM. 2) no mutual attention between an active TR and an active LM. 3) no mutual attention between a passive TR and an active LM. 4) no mutual attention between a passive TR and a passive LM. 5) mutual attention between an active TR and an active LM. In the parameter of intentionality, function is considered. The predominant value is no mutual attention between an active TR and a passive LM for *at*, *beside* and *near*. In the case of *by* and *next to*, the difference resides in no mutual attention between an active TR and an active LM.

In comparison with the highest percentages, the prepositions *near*, *by* and *at* (in the same order of high frequencies) entail more uses of no mutual attention for the intentionality (functional pattern) than others do. A passive LM is predominant for *near*, *at* and *beside*, whereas an active LM is predominant for *next to* and *by*.

As for dynamic intentionality, the predominant value is no mutual attention between an active TR and a passive LM for *at* and *near*. We see that these two prepositions favour the role of an intentional TR. In contrast, the predominant value is mutual attention

between an active TR and an active LM for *beside* and *next to,* which suggests that both participants in the scene share an intentional attitude to some extent. As for *by,* there is no mutual attention between an active TR and an active LM, which suggests that this preposition does indicate a particular intentional attitude on the participants but not addressed to each other.

Comparing the percentages for dynamic intentionality, the prepositions *next to* and *beside* entail a high frequency of mutual attention, whereas *near* and *at* entail no mutual attention. A passive LM is predominant for *near* and *at,* whereas an active LM is predominant for *next to*, *beside* and *by*. These frequencies imply their uses and primary senses.

In the parameter of frame of reference, the predominant value is intrinsic for *at* (65,3%), *beside* (76,9%) and *next to* (93,8%). The highest percentage of intrinsic frame of reference is 93,8% for *next to*. In contrast, the predominant value is relative for *by* (59%) and *near* (88,1%). This fact may be relevant for choosing these prepositions to depict situations where the speaker's vantage point is the adopted perspective or in deictic reference relative to the speaker. On the other hand, *at, beside* and *next to* are favoured in non-deictic reference where the speaker's vantage point is less relevant.

In the parameter of relative position, the result obtained is the predominant value of asymmetry for *at* (76%), *beside* (57,7%), *by* (73,8%) and *near* (97,8). However, the predominant value for *next to* symmetry with 52,6%. The highest percentage of asymmetry position is 97,8%. Thus, the majority of examples of *near* show asymmetry.

The meanings of *near, at, by* and *beside* entail an asymmetrical position due to the high frequencies, whereas the meaning of *next to* entails a symmetrical position between TR and LM. The relative position is similar in the first four prepositions.

In the parameter of animacy, the data shows the predominant value is an animate TR and an animate LM for *beside* (42,6%), *by* (58,6%) and *next to* (51%). As for *at* (55,1%) and *near* (73,2%), the predominant value is animate TR and inanimate LM. Thus, the highest percentage is 73,2% for *near*, and the lowest rate is 42,6% for *beside*.

These frequencies imply the uses and differences between these prepositions. The use of an inanimate LM predominates for *near* and *at*. In contrast, *beside, next to* and *by* facilitate an animate LM.

The results show no significant difference between the five prepositions in the relative size parameter. The predominant value is a smaller TR than a LM (TR<LM) for *at* (84,6%), *beside* (60,1%), *by* (53,8%), *near* (95,2%) and *next to* (45,1%). Langacker and Talmy both proposed the theory that a TR is smaller than an LM in the context of prepositions. The highest percentage is 95,2% for *near*. By contrast, the lowest percentage is 45,1% for *next to*. In the case of *next to,* it is expected that most examples show the same relative size as the other prepositions, that is TR<LM. Interestingly, a significant percentage of 20,4% shows an equal or similar size between the participants

(TR=LM) for *next to,* due to the similarity of entities in a sequence and a contiguous position.

In the parameter of image schema, the predominant schema is the topology group with a different value for each preposition. As for *beside*, it is centre-periphery (52,4%), for *near* it is near-far (99,2%) and for *next to* (45,9%) it is sequence. In the case of *at* (38,6%), it is the force group, enablement (access), and for *by* (92,4%), it is the passive voice and agent in the majority of examples. The highest percentage is 99,2% for *near* within the near-far topology schema. These percentages imply the use of a topology schema for *near, beside* and *next to*.

These findings help us understand the meaning of these five prepositions, taking diverse parameters into account. In the following lines, the meanings are described with an emphasis on those semantic characteristics with the highest percentages for each preposition:

In the meaning of *at,* the values showing the highest percentages are the dimension of function (56,6%), the parameter of intentionality (function) (40,3%), an intrinsic frame (65,3%), an asymmetry position (76%) and the relative size of TR<LM (84,6%).

In the meaning of *beside,* the highest percentages correspond to the value of proximity (26%) in the parameter of topology, the dimension of dynamics (48,8%), the parameter of intentionality (dynamics), an intrinsic frame (76,9%) and the relative size of TR<LM (60,1%).

In the meaning of *by,* the highest percentages are the dimension of function (84%), the parameter of intentionality (function) (46,9%), the animacy (animate TR and animate LM) with 58,6%, and an image schema of passive voice and agent (92,4%).

In the meaning of *near,* the highest percentages occur for the dimension of function (59,5%), the parameter of intentionality (function) (58,5%), a relative frame (88,1%), an asymmetry position (97,8%), the relative size of TR<LM (95,2%) and an image schema of the topology group, near-far (99,2%).

In the meaning of *next to,* the highest percentages occur in the value of sequence (dynamics) (40,8%), the dimension of dynamics (52,9%), the parameter of intentionality (dynamics) (33,3%), an intrinsic frame (93,8%) and a symmetry position (52,6%).

A summary of the main findings and the values discussed in this section are provided in the next chapter.

Chapter 9: Conclusions

In conclusion, previous research has been helpful after comparing some studies written by other linguists and authors who explain the use of prepositions and their meaning in different contexts. Therefore, I have noticed that part of the information and clarifications come from dictionaries, one part from linguistic books and another part from grammar books, all of which are necessary to develop knowledge of prepositions. Because of the variety in the number of usages of prepositions in English, those for whom it is not their first language will find such information invaluable.

For example, linguists clarify that understanding the correct usage of prepositions involves understanding different uses of prepositions. Still, this understanding also refers to the perception of geometrical objects and the necessity to identify the logical functions, the geometry of space, the geometrical concepts and the functional relationships of objects or entities.

The issue in this field is in the use of prepositions logically and not by intuition. The description of properties, perceptual concepts, and spatial relations (e.g., contact, distance, inclusion, etc.) is found in linguists and researchers' work. In contrast, grammarians document the meaning of words and expressions derived from the formulation of rules and the explanation of theory in the grammar books. Moreover, reading a wide variety of books is needed to comprehend prepositions better and develop a broad knowledge of their uses.

For example, in the grammar books, grammarians chronicle the development of the meanings of words and supply the latest meanings of those words, sometimes giving examples of their uses in the past which may have been different to how they are used today.

It is appropriate to highlight the positive contributions of grammarians and, for example, state the kind of information that linguists' research contributes to that of grammarians. In that way, the work of both is clearly defined positively to contribute to new explanations. This is an excellent example of how to highlight the work of each while illustrating the division from each other. In that way, I supply a helpful contrast of the work of these distinct groups.

This approach allows me to analyse the same number of examples (one thousand examples of each preposition) from the BNC in view of previous research (see section 6.1). Although this analysis might have involved a larger number of instances, time limitations and COVID restrictions have constrained my research tasks. The intention was to go into detail for nine parameters and a wide variety of values within these parameters. Then, identify the frequency of these values concerning five prepositions expressing spatial relations in the horizontal axis. In a comparative analysis, identifying the frequency of uses is necessary to determine the uses of prepositions and the updated evolution of their applications to express perceived scenes.

Even though some prepositions may appear similar in meaning to others, slight and subtle nuances exist. Thus, exploring the contrasts in their senses is fundamental to developing a description of these nuances. Highlighting the main objective of this research, the differences between the five prepositions have been revealed because of the focus on the function of entities and their geometrical positions analysed in examples within particular contexts. Although observing the concepts of geometry and function is relevant for a correct comprehension of contexts, some difficulties may occur in identifying locations concerning a lack of images and a precision between distance or proximity. However, I have tried to manage it by analysing the full context of each example. As table 73 shows, the percentages show reasoned and coherent results in the interpretations of locations.

In this dissertation, the terms of spatial relations and their implications of contrasts may be useful applications for advanced levels in the English language learning process. In most cases, students often find that acquiring words related to spatial locations is challenging and laborious. If the selected semantic parameters and values are introduced to students of a foreign language, it will be easier for them to understand how the variations of positions and orientations of objects influence the appropriate use of spatial terms such as horizontal prepositions.

In keeping with these findings, previous approaches to the semantics of spatial relations focus on the identification of one parameter, such as the semantic perceptual dimensions (topology, dynamics and function) proposed by Navarro i Ferrando (1998), the frames of reference (relative, intrinsic and absolute) suggested by Levinson (2004), the image schemas identified by Jonhson (1987) and by Lakoff (1987), or animacy, whose relevance was demonstrated by Feist (2000). Therefore, these parameters are the semantic dimensions, the frames of reference, the image schemas, and animacy. In contrast to these previous approaches, I suggest a method to analyse these parameters together that has not been proposed before.

In analysing data, the frequency of occurrences may present an evolution of the senses of a preposition and the direction of variation. However, the low frequency of values (in the cases of *beside*, *near* or *next to*) may show the few uses of a value and a possible change of meaning in spatial relations. In some cases, the variation suggests the disappearance of a value in the examples involving a similar sense and the acceptance of other prepositions in this specific context. In contrast, the variations may suggest a high frequency of uses and, therefore, an increase of these uses being the common uses of a preposition such as *at* or *by*.

Considering that the most common prepositions are a small set, in my analysis, the most common by far are *at* and *by* (according to the Merriam Webster Online Dictionary). In analysing the predominant parameter among the three semantic dimensions of topology, dynamics and function, the results show that *at* has more values than other prepositions and more senses. For example, the usual meaning is when a TR does an action at an event or festivity within the functional parameter. As a dominant linguistic

characteristic in the case of *by*, the uses are in passive constructions and the predominant values of the functional parameter are realisation (47,5%), control (24,6%), cause (4,4%), support (4,1%), instrument (means or tool) (3,2%) or link (0,2%). There are fewer values in the cases of *beside*, *near* and *next to* than for other prepositions because they are usually related to a specific meaning.

The relevance of these findings can also be applied to the analysis of discourse. By understanding the many examples of the two most frequently used prepositions *by* and *at*, students of English will enhance significantly their ability to communicate given the vast network of phrases which can be formed with these prepositions.

In similar ways the uses of the other prepositions studied can have the same knowledge-expanding influence. In the field of pedagogy, the earlier these uses of *by* and *at* along with the aforementioned prepositions are learned the quicker will be the development of children's comprehension of English constructions.

Translation from a language into English is fraught with difficulties. For example, in Spanish the preposition *al lado de* or *cerca de* may be translated as the equivalent to the prepositions *beside*, *by*, *near* or *next to*. The preposition *en* may be translated as *at*, *in* or *on*. Spanish does not contain the same degree of variation in which context determines the use of a particular preposition. In some cases, prepositions in Spanish do not equate with what might be considered to be their English counterparts. For example, *they were at a summer festival. The lake beside the car park. The gardens by the fountains. The valley near the market town. We were sitting next to one another in class.* These are examples of where, in English, context determines the use of *at, beside, by, near or next to.*

The novelty in my approach to this research lies primarily in the fact that it is a method which has not been employed before and should therefore offer a freshness and clarity into the methodology of studying prepositions, yielding new insights into both their uses and into how these uses are to be understood.

9.1 Further research and some suggestions

- Metaphorical structures and idiomatic expressions could be included for further research.
- A teaching focus could be added in a foreign language implementing some tools and exercises.
- A comparison of some prepositions could be presented in English as a foreign language and Spanish as a native language.
- A list of examples of prepositions may emphasise the topology dimension and include the explanations found about the topological dimension from additional sources.

- An exploration and a list of definitions of the term *topology* from different sources to understand this term, including some examples of prepositions within this dimensional parameter and a definition created by myself.
- An analysis of prepositions in literary texts, like the book *The Hobbit* by Tolkien.
- A comparison of prepositions used in the book *The Hobbit* by Tolkien and the BNC corpus.
- A comparison of random samples of two prepositions may be analysed from different corpora such as BNC and COCA.
- An analysis of two genres from a corpus with the analysis of one of the most common prepositions ***at.***
- The metaphorical expressions using the terms of colours and considering the distinct meanings.
- In pedagogy, the description and the uses of two prepositions, for example *at* and *by*, with suggestions of learning exercises for children's literature (books of Roald Dahl).

9.2 Resumen del estudio en castellano

El estudio titulado "la polisemia de las preposiciones *at, beside, by, near* y *next to*: el eje horizontal de las relaciones espaciales" presenta una comparación de significados entre estas cinco preposiciones para así poder usarlas de una manera lógica y no por intuición.

Los gramáticos explican el desarrollo de los significados y los últimos usos de las preposiciones derivados de la formulación de normas y la explicación de teoría en los libros de gramática. Además, los estudios de los lingüistas e investigadores aportan la descripción de las características lingüísticas de las palabras, los conceptos perceptuales y las relaciones espaciales como contacto, distancia o inclusión. Pero esta descripción es también en relación a la percepción de los objetos geométricos, la identificación de la función lógica, la geometría espacial, los conceptos geométricos y las relaciones funcionales de las entidades. De esta manera, los estudios de ambos grupos, los gramáticos y los investigadores, son positivas aportaciones con nuevas explicaciones y clarificaciones.

Al principio del presente estudio puede parecer que algunas preposiciones tengan una similitud de significado con otras preposiciones y no se pueda valorar hasta qué punto existen diferencias en los significados de las relaciones espaciales horizontales. Pero después de realizar un análisis de mil ejemplos de cada preposición se puede comparar los resultados sobre las diferencias de las características y los valores predominantes. En un análisis comparativo, la identificación de la frecuencia de usos es necesaria para identificar los usos de las preposiciones y los cambios actuales.

Para los estudiantes de inglés como lengua extrajera, el tema de las preposiciones es bastante difícil durante el proceso de aprendizaje de los usos y las normas gramaticales debido a la gran variedad de preposiciones. El principal motivo es que en español no

tenemos los mismos matices y contrastes de los distintos significados. Por ejemplo, la preposición *en* al traducirla del español al inglés podría equivaler a *at, in* o *on*. También la preposición *al lado de* al traducirla del español al inglés podría equivaler a *beside*, *by* o *next to*.

La motivación de realizar este estudio sobre las preposiciones horizontales es poder entender el uso de las preposiciones, los diferentes significados espaciales y los sentidos que no aparecen en los diccionarios. Las preposiciones tienen sus propios significados y sentidos diferentes. Así pueden complementar verbos, sustantivos, adjetivos y añadir un significado al contexto. El principal propósito de investigación es poder ofrecer un criterio con parámetros y obtener un esquema de significados desde la percepción visual del espacio. Por lo tanto, las dos razones principales para desarrollar el campo semántico de las preposiciones son: el interés por hacer una descripción de la gramática en relación a las relaciones espaciales debido a su uso frecuente en las comunicaciones orales o escritas, y otra razón es clarificar estas cinco preposiciones, a saber, *at*, *by*, *beside, next to* y *near*, con conceptos geométricos y parámetros perceptuales para así ampliar la información sobre los usos semánticos en cuestión.

Los conceptos de las relaciones espaciales y sus implicaciones de contrastes pueden ser de utilidad para mejorar el aprendizaje en niveles avanzados de inglés. Si a los estudiantes de inglés como lengua extrajera se les muestra los parámetros y valores seleccionados pueden entender mejor cómo las variaciones de las posiciones y las orientaciones de los objetos tienen una influencia sobre el uso apropiado de los conceptos espaciales y las preposiciones.

En cada una de las preposiciones he analizado nueve parámetros y unos valores de cada parámetro. Los parámetros usados en este análisis son: 1. La dimensión semántica de topología, de dinámica y de función. 2. El trayector (TR) 3. El landmark (LM). 4. La intencionalidad de los participantes (atención mutua/no atención mutua, activo/pasivo). 5. El marco de referencia (relativo, intrínseco o absoluto). 6. La posición relativa (simetría/asimetría). 7. El estado de animado o inanimado entre los dos participantes (el participante principal y otro participante que se relaciona en la escena con el principal) que en inglés son trayector (TR) y landmark (LM). 8. El tamaño relativo (TR=LM, TR<LM, TR>LM). 9. El esquema de imagen (grupo de topología, grupo espacial o grupo de fuerza).

En referencia al proceso para realizar el análisis, en cada una de las cinco preposiciones he analizado mil ejemplos obtenidos en el mismo orden que aparece en el corpus BNC en un contexto. Los ejemplos son de fuentes de periódicos y de géneros literarios de ficción. Los ejemplos metafóricos y figurados no están incluidos en este análisis. Únicamente he analizado los ejemplos concretos y literales. En cada ejemplo he analizado los nueve parámetros y los valores encontrados para cada parámetro. De este modo, he obtenido unos resultados de unos valores predominantes en cada parámetro mostrados en unas tablas. Estos valores son los significados semánticos que son frecuentes en cada una de las preposiciones. Dependiendo de la función y el contexto

del ejemplo, una preposición puede significar, por ejemplo, proximidad, movimiento u operación entras otras opciones.

Considerando que las preposiciones más comunes son pocas, en mi análisis las más comunes son *at* y *by* (según el diccionario online Merriem Webster). Los resultados muestran las principales diferencias y características lingüísticas con los valores predominantes. En el caso de la preposición *at*, hay más valores y más usos de significados que en otras preposiciones en los parámetros de dimensión semántica de topología, de dinámica o de función. La preposición *by* predomina en las construcciones en voz pasiva y los usos de función como, por ejemplo de realización, control, causa, soporte, instrumento (medios o herramienta). En el caso de las preposiciones *beside*, *near* y *next to* hay menos valores que en las otras preposiciones debido a que normalmente se relacionan con un significado especifico.

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