UNIVERSITAT JAUME I

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A COGNITIVE SEMANTICS ANALYSIS OF THE LEXICAL UNITS *AT*, *ON* AND *IN* IN ENGLISH

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CONTENTS

Adv	Adverb	
AdvP	Adverb Phrase	
AI	Artificial Intelligence	
AP	Adjective Phrase	
BC	Brown Corpus	
	A	Press: Reportage
	B	Press: Editorial
	C	Press: Reviews
	D	Religion
	E	Skills and Hobbies
	F	Popular Lore
	G	Belles Lettres
	H	Miscellaneous
	J	Learned
	K	General Fiction
	L	Mystery and Detective
	M	Science Fiction
	N	Adventure
	P	Romance
	R	Humour
CG	Cognitive Grammar	
DO	Direct Object	
DIM	Dimension	
EFL	English as a Foreign Language	
GB	Government and Binding	
GG	Generative Grammar	
IO	Indirect Object	
ICM	Idealised Cognitive Model	
KWIC	Key Word In Context	
LFG	Lexical Functional Grammar	
lm	Landmark	
LS	Logical Structure	
L-Space	Linguistic Space	
N	Noun	
NP	Noun Phrase	
OE	Old English	
P	Preposition	
PLA	Place	
PP	Prepositional Phrase	
P-Space	Perceptual Space	
RRG	Role and Reference Grammar	
tr	Trajector	
V	Verb	
VP	Verb Phrase	
VPC	Verb Particle Construction	

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INTRODUCTION

0.1   The Problem

Learners of English as Foreign Language (EFL) like myself encounter many difficulties in their quest for fluency in the language. In their struggle to actively master English vocabulary they generally assume that nouns and verbs are crucial, so that the general attitude consists of trying to learn as many of them as possible. The semantic relevance of almost-every-sentence words is diminished in considering them as *easy* words. Learners just tend to apply a straightforward correspondence to *easy* words in their mother tongue, let us say Eng. *in* equals Sp. *en,* Eng. *to* equals Sp. *a*, and so on − and they think the job's done. The magnitude of this error is in my opinion so enormous that it may delay the fluent native-like mastery of the language − or a near idiolect − for decades. Moreover, an even bigger problem is that linguists have generally described this type of words only functionally or positionally, but the semantic factors that determine their choice in use have not usually been considered. People seem to ignore the fact that these words might mean a lot. Whenever their choice in use is difficult to explain, the general claim is that it is chaotic, capricious, or that these words form part of other lexical units to which they do not contribute any meaning. The lexical units *at, on* and *in* are three of these words, and this dissertation goes against that general claim.

As a postgraduate student at the University of València, I already had an intuition that this type of words might mean more than I had been told. Therefore, I directed my work towards an attempt to get some idea of what some of these words could mean. At that time, I carried out a research project in Contrastive Analysis on the Spanish prepositions *a* and *en* and their English equivalences[1]. In that work, a corpus based on English translations of Lorca's *Yerma* and *La Casa de Bernarda Alba* was analysed. The English semantic equivalents for *en* turn out to be the following: In static and non-directional contexts: *at*, *on*, and *in*; in dynamic directional contexts: *on(to), into, in*; and in extensional contexts: *for*. Spanish *a* in dynamic contexts is translated as English *to, on(to), at* and *for*; in static contexts it is translated

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[1] A reduced version of that work has been recently published (See Navarro, 1997).

as *at*, *by*, and *in*. On the basis of these actually found equivalences I could test the hypotheses raised by different semantic accounts of Spanish and English prepositions. The application of structural componential semantic analyses of English and Spanish prepositions (Bennett, 1975; Trujillo, 1971) was a failure. Bennett's and Trujillo's prepositional systems are subdivided into different subsystems characterised by common semantic features. These systems reduce the meanings of some prepositions to such an extent − particularly the ones I tried to analyse − that the correspondences they predict do not fit the translation equivalences actually found, where prepositional phrases in the source language are translated by prepositional phrases in the target language[2]. Other descriptions, like the cognitively oriented account by R. Dirven (1989) for English, and the descriptivist account by E. Roegiest (1977) for Spanish, predict more of the actually found equivalences. These results indicate that structural componential analysis is inadequate for prepositional semantics, whereas other approaches offer wider possibilities. All in all, I verified that *at, on,* and *in* could stand as the translation of both *a* and *en* in different contexts. That fact raised the question: What semantic factors determine the choice of *at, on,* and *in* in English?

I started a bibliographical search on semantics and prepositions which has led me to this dissertation. At the beginning, I had the intention of comparing the whole Spanish and English prepositional sets. In the end, I realised that the semantics of this kind of words is so complex that only one language should be dealt with, and a reduced group of lexical units, not the whole set. I chose those that had triggered my curiosity, namely *at, on,* and *in*, also in part because they seem quite the same semantically to Spanish eyes, and to choose one of them is problematic in many instances for Spanish learners. My decision to adopt the Cognitive Semantics approach to the topic is not gratuitous. My bibliographical search on prepositional semantics research in the last decades most frequently ended up with works that adopt this approach. I have found Cognitive Linguistics[3] is the linguistic paradigm which has produced the biggest amount of work and analyses in the field of spatial semantics, not only in English, but also in many other languages.

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[2] For details see Navarro (1997).
[3] Cognitive Linguistics is a trend in linguistic theory which emerged in the eighties as a reaction against formalist models of the Generative paradigm.(See Ch1 §3, and Ch3).

0.2   *Aims and scope of this work*

The aim of this dissertation is a detailed analysis of the semantic structure of three lexical units of the English language, namely the units *at, on* and *in.*

By analysing the semantic structure of spatial relations as expressed by the English lexical units *at, on,* and *in* I will propose a theory of how linguistic spatial meaning is organised in human cognition. I will not go further into formalisation of the model, since my aims are not computer programme development, language formalisation, or machine language processing.

As a teacher of EFL to university students, I deem the development of semantics crucial for teaching purposes. By means of semantics one could make students aware of facts like polysemy, idiomaticity, cultural diversity, false friends phenomena, and diversity in the use of single items. The Cognitive Semantics account of metaphorical thought and reason has been recently being applied to language teaching purposes (Selinker & Kuteva, 1992; Kövecses & Szabó, 1996), and for teaching translation and interpretation techniques (Alexeieva, 1995). According to their results, it seems quite obvious that understanding the mechanisms of conceptual metaphor facilitates language learning, and it is useful for developing interpretation techniques. I will mainly focus on polysemy, idiomaticity, cultural specificity, and diversity in the use of single items, particularly, *at, on,* and *in*. These aspects are most difficult to deal with in foreign language teaching. The central aim of this work, however, is not teaching methodology, but the linguistic phenomena themselves, and a detailed analysis of those phenomena. For example, the linguistic unit *over*, as previously analysed (Brugman, 1980; Lakoff, 1987; Dewell, 1994) is a highly polysemous lexical item. It is not possible to find a *core sense* of this unit, i.e. a single configurational feature that should be common to all its senses. Therefore, a prototype model for the description of polysemy has been applied, some senses being more prototypical and others more peripheral. The limits of the semantic category OVER are fuzzy, and an overlap with uses and senses of other units is not discarded. All the senses described are the product of elaboration or extension of a prototypical and basic image-schema that is extended or transformed. Besides, metaphorical and metonymic mappings create new uses of this unit. Nevertheless, these

descriptions fail to incorporate certain aspects of linguistic meaning, such as functional aspects. As I will attempt to show, other lexical units make use of at least those mechanisms described for *over* so as to convey meaning in language usage, but I will also try to incorporate functional and pragmatic aspects of meaning.

The model proposed should be extendable to other linguistic units, and not an *ad hoc* artificiality. The model should take into account previous proposals of semantic structure for spatial terms – radial networks are at present the most powerful model of prepositional polysemy in Cognitive Semantics[4]–, but it should also make compatible all aspects of meaning – referential, functional, metaphorical, pragmatic. A semantic model, as understood in this work, is not predictive of the production of single utterances (as Generative Linguistics claims to be), but explicative of the motivation of linguistic facts. Semantics would look for the principles that underlie this motivation of facts, but in no way should it be able to predict facts themselves. Among these principles we find the speakers' ability to frame a situation (Fillmore, 1982, 1985), to create mental spaces (Fauconnier, 1985; Fauconnier & Turner, 1994; Fauconnier & Sweetser, 1996), to manipulate and transform image-schemas (Johnson, 1987; Lakoff, 1987; Gibbs and Colston, 1995; Fornés and Ruiz de Mendoza, 1997; Peña, 1997), and to establish conceptual mappings within a domain – metonymy – or between different domains – metaphor – (Lakoff and Johnson, 1980; Lakoff and Turner, 1989; Lakoff, 1993). All these are abilities that speakers put into practice whenever they make use of their language. The understanding of these mechanisms[5] will help explain what speakers do and mean as they produce utterances, particularly in our case with *at, on,* and *in*. Other aspects, such as social bounds and relationships (sociolinguistics), communication strategies and discourse organisation (discourse analysis), or situational factors (pragmatics) are also essential in language use, but they will not be covered in this dissertation.

As I determined to analyse English spatial semantics, I found that those units considered most basic, easy, or just taken for granted, namely *at, on,* and *in*, had frequently been an object of analysis (Lindkvist, 1950, 1978; Bennett, 1975; Miller and Johnson-Laird, 1976; Herskovits, 1986; Cienki, 1989; Vandeloise, 1991, 1994; Sandra & Rice, 1995; Rice, 1996; Beitel, 1997).

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[4] Cf. § 3.9
[5] Chapter 3 offers an introduction to these notions.

However, I did not find a semantic explanation of idioms, metaphorical and metonymic uses, phrasal verbs, prepositional verbs, and other combinations that incorporate, presumably, a shared semantic component in virtue of these lexical units. This will be an aim of this work. However, I do not claim that this aim can be completely achieved, at least in this work.

0.3   *Hypothesis and corpus*

The initial hypothesis of this work is summarised as follows:

1.- A linguistic unit should always be meaningful and always contribute its meaning, no matter what the syntactic construction where it occurs.

2.- The meaning of all the uses of a unit in different constructions should be explainable by virtue of a single coherent semantic structure (1 and 2 imply that a unit like *in* has the same semantic structure when it appears as a preposition, adverb, adverbial particle in phrasal verbs, prefix, suffix, adjective, and verb).

3.- The semantic structure should represent the polysemy of a unit, with prototypical and peripheral senses.

4. All the senses of the semantic structure should be linked with no gap in the chain.

5.- Metaphorical and abstract uses should be derivable from senses based on bodily experience.

6.- The semantic structure should make apparent the mechanisms and patterns of meaning elaboration and extension. These mechanisms and patterns should explain how the semantic category extends and how it could possibly extend in the future, but they do not predict the exact way in which this will happen, or if it will happen at all.

The initial hypothesis will be tested on a corpus of 9,397 examples, of which 2,238 are examples with *at*, 2,511 are examples with *on*, and 4,648 are examples with *in*. The sample has been obtained from the Brown Corpus of Written American English (Francis & Kucera, 1961).

The classification of senses drawn from data analysis will be employed for designing the radial network of senses that represents the semantic structure of each unit. At the end of the analysis, a proposal for semantic structure in the form of a radial network of senses, will be offered for each unit under analysis. This proposal, however, is assumed to be the result of the analysis based on the corpus utilised. Analyses based on other corpora or other varieties of English might yield different results[6].

0.4   Summary of the work

In chapter 1, central aspects relative to language as viewed from the different cognitive disciplines will be reviewed[7], particularly those aspects that are most relevant for this work. Emphasis will be given to the issue of mental representations. Finally, relevant assumptions and terminology in Cognitive Linguistics will be introduced.

Chapter 2 offers an overview on syntactic approaches to prepositions and other syntactic categories. The final part of the chapter is a proposal of description for a set of units which resist categorisation. The three lexical units *at*, *on* and *in* fall within that set. The hypothesis of the continuum in language between lexicon and grammar (Taylor, 1989, 1994) underlies that description. The aim is to make apparent the position of *at, on* and *in* within the spectrum of the continuum. A semantic description of the category of prepositions is provided according to Cognitive Grammar (Langacker, 1986, 1987, 1991 *b*).

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[6] The theoretical rationale, the procedure of analysis, and the corpus itself are described in detail in chapter 5.
[7] Philosophy, Psychology, Anthropology, Neuroscience, and Artificial Intelligence, together with Linguistics, are the disciplines that form Cognitive Science, and should not be overlooked in a study where language is not considered independent of cognition.

In chapter 3 an overview of Cognitive Semantics is offered, with an emphasis on topics such as the nature of human categorisation, image-schemas, patterns of meaning construal, and mechanisms for meaning extension, such as metaphor and metonymy, as well as mental spaces. These notions will be necessary for a proper understanding of the semantic account.

Chapter 4 presents the state of the art in relation to the semantic categories *AT, ON* and *IN*. The general trend in previous authors consists of taking into account only one aspect of perception. The descriptivist account of Lindkvist is extensively dealt with, because it offers an exhaustive review of types of contexts for these lexical units in their spatial senses.

Chapter 5 introduces the model used in this work. The model tries to put together the different aspects of perception which have previously been exploited separately. The three main aspects taken into account are: topological relationships, force-dynamic patterns of interaction, and finally, functional relationships between entities. All three aspects have been found to be crucial in the semantic structure of the units under analysis. A description of the corpus utilised follows, as well as a planning of the procedure in the analysis.

Chapters 6, 7, and 8 produce a detailed analysis of the semantic categories *AT, ON* and *IN*. A radial network stands for the results of the analysis of each lexical unit. Basically, each radial network consists of a central sense – a *conceptual image-schema* based on bodily experience – which combines the three aspects mentioned above. Each *conceptual image-schema* may undergo certain shifts, which reflect modifications in its basic meaning. Further specialisation of meaning is accounted for through partial sanction of the schema. The senses produced form chains of meaning available for metaphorical and metonymic mappings, which are useful to refer to metaphorical and abstract domains. Polysemy is analysed within the scope of prototype semantics, following, in part, semantic models that have been already shown to be of use for this purpose, such as radial categories (see Lindner, 1983). Semantic categorisation is accounted for in a consistent way with Grammaticisation theory, in an attempt to provide an explanation for semantic bleaching phenomena, and in accordance with the thesis of the continuum between grammar and the lexicon.

Finally, conclusions are offered in chapter 9.

1. COGNITIVE SCIENCE AND COGNITIVE LINGUISTICS

1.1 Introduction

One of the foundational principles of Cognitive Linguistics is the integrational character of cognitive disciplines. According to this principle, Linguistics as a cognitive discipline should rely on conceptions from other cognitive disciplines such as Philosophy, Psychology, Anthropology, Neuroscience and Artificial Intelligence (AI). The conception of language and language learning assumed in this dissertation incorporates some views from these fields. In particular, the issue of whether mental representations are propositional or imagistic plays a central role in this work. Finally, basic assumptions in Cognitive Linguistics and terminology employed in later chapters are introduced.

1.2 Issues in the Philosophy of Language

Three main assumptions which find treatment in Philosophy underlie this work:

a) The non-objectivist character of linguistic phenomena.
b) The social reality of language.
c) The essential role of language in the development of thought and world view.

a) The first issue is discussed by Locke (1690) in his idea of representational realism. Basically, in Locke's view, thought has a certain intentionality, and its intentional objects are not real objects or their qualities, but mental entities (ideas), which represent real objects and their qualities by virtue of causal relations. In other words, we perceive objective events, but we do it only through our senses, not directly. In an objectivist view, events are *per se* intersubjective (two people can perceive an event in the same way), substantive (events occur whether they are perceived by people or not), physical (events can be scientifically analysed in order for people to gain a better knowledge of them than through simple perception) and

normative (the correctness or incorrectness of perception by human beings is determined by the events themselves). However, the representationalist view claims that human perception of the world is mediated. Human beings may be under the effect of hallucination (through physical agents that interfere with clear perception, such as alcohol, drugs, lack of necessary chemicals in the brain, etc.) or they may suffer a delusion (optical, acoustic, etc. illusion); in addition, there may be a temporal gap between the event perceived and actual perception (for example of seeing galaxies being born or hearing a clap of thunder); finally, knowledge depends on feeling on what is perceived (thus, bats do not perceive the world with the same feeling as people do[8]). Locke's causal theory of perception states that in optimal circumstances, when perception is true, it is nonsense to identify its content and the elements of that content with present real conditions in the external situation that correspond to it. According to Locke's view, what we know are our feelings, which are private (two people cannot have the same feeling), transparent (feelings have to be felt by someone), irreducible (feeling cannot be scientifically described in order to be better known), and finally, it is nonsense to speak of their correctness or incorrectness. People have access to real objects only through inference based on feeling. This inference is so habitual and automatic that we forget that we perform it all the time. It is made under the assumption that there is a causal relationship between certain characteristics of our experiences and certain characteristics of the state of affairs that produce our experiences. In short, from Locke's ideas derives the thesis that the intentional objects of language and thought are characterisable without presupposing the existence of objective entities. Language cannot directly refer to non-mental entities, because we do not have direct access to the external world. The external world causes experiences in us with certain contents. These contents are what we directly know. Our notion of an objective world is obtained through inference from our knowledge of the mental world. According to this view, extralinguistic reality is not the primary meaning of words, but is linked indirectly to words by ideas, these being the content of experience. Thus, the meanings of *at, on* and *in* as dealt with in this work will not refer to real world objectivist spatial relationships among entities, but to those relationships as they are conceptualised by human beings.

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[8] This argument has been developed by Thomas Nagel in 'What is it like to be a bat?', *Philosophical Review* LXX-XIII, 435-450.

b) Locke's internal semantics gets into conflict with the social character of natural languages, i.e. its conventionality. For Locke, language in each individual is epistemically private. It is impossible to know if words mean for us the same as for other people. Locke cannot build the notion of *the same language* conventionally shared. However, language is conventional and this implies that the existence of a certain meaning in a language depends on agreement between the users of that language, so that they use it regularly for certain purposes in certain situations. The social and conventional character of language has been discussed by Searle (1995). Searle distinguishes between an epistemic and an ontological sense of the opposition objective/subjective. Following Searle (1995: 7ff.), we find epistemically subjective judgements like *Rembrandt is a better artist than Rubens*, and epistemically objective judgements like *Rembrandt lived in Amsterdam during the year 1632*. The difference resides in interpersonal agreement on the judgement. Ontologically, we distinguish between objective facts like *Mount Everest is more beautiful than Mount Whitney*, and subjective facts like *I now have a pain in my lower back*. The difference resides in the mode of existence. Ontologically subjective facts exist only for subjects, whereas ontologically objective facts exist independently of any subject. These distinctions lead Searle to make a difference between intrinsic and observer-relative features of the world. Intrinsic features of the world are ontologically objective whereas observer-relative features are ontologically subjective, though they may be epistemologically objective. So, the intrinsic features of a screwdriver are the molecules that constitute its physical reality. The observer-relative features of that screwdriver are the functions for which it has been designed. According to this argument, human beings assign functions to world entities, and these functions are not ontologically objective. But if these assignments become conventional and agreed upon, they become epistemologically objective. This is the basis for social facts and social objects. Money, marriage, academic careers, games, are social entities which are epistemologically objective, but they do not have ontological existence, because they are not intrinsic properties of the world. On these grounds, Searle develops the idea of social reality. Language is part of that social reality. Thus, language refers to epistemologically objective entities. This implies that different cultures may not share the same social realities, and consequently their worlds differ. Language itself may be a crucial instrument for creating social reality. Thus, the relationships expressed by *at, on,* and *in* are observer relative. These meanings are agreed upon, they are epistemically objective, but they do not represent intrinsic qualities of spatial

relationships among objective entities in the world. This implies that one entity might possibly be seen simultaneously as *in, at* or *on* another entity without changing the external ontological conditions of the situation. In any case, the hearer would understand what is meant because the meanings are epistemically objective.

c) In his hermeneutic philosophy, Gadamer (1986) has developed a conception of the world based on the centrality of language. Language as a social fact creates the social world. For Hermeneutics, concepts are instruments which we prepare in order to approach objects and submit them to our knowledge. Natural language is necessary to create artificial languages, and it may constantly influence our knowledge of the world. The world is always a world interpreted in language. Her mother tongue gives the child her first discovery of the world as well as the first articulation of that world. Language is the product and result of experience, but linguistic senses are always articulated in interpretative contexts. Perceptions which take something for true have already interpreted data of the senses by means of language. The formation of concepts is always hermeneutically conditioned by spoken language, and the relationship between words and concepts determines thought. At the same time, learning language implies speaking language, and linguistic usage is sovereign. Linguistic education is governed by examples. Concept formation depends on linguistic life. In short, according to hermeneutics, knowledge of the world is mediated by language. And the linguisticity of our 'being-in-the-world' articulates the whole range of our experience. Thus, English native speakers learn as children to perceive spatial relationships in the objective world according to the concepts *AT, ON* and *IN* among others. For Spanish speakers *A* and *EN* provide a different conceptual grid. Therefore, English and Spanish speakers perceive the same spatial relationships, but they conceptualise and experience them in a different way.

1.3   *Issues in Psycholinguistics*

The issue of language development is central to linguistic theory. Three main views contend:

a) Innatism: Firstly, the Chomskyan paradigm defends the innateness of language structures (Lenneberg, 1967; Bickerton, 1990; Jackendoff, 1992; Pinker, 1994). Its arguments, namely,

speed of acquisition, age dependence, poverty of data, convergence among grammars, language universals, and human specificity have no real grounding, as has been recently shown by Geoffrey Sampson (1997).

b) Constructivism: Secondly, the constructivist Piagetian view denies innateness of language structures, and deals with language development as an egocentric process. Piaget and Inhelder (1959) postulate a set of stages that children go through when learning a first language. However, they view this process as an individual process that constructs reality and language in the child's mind. This process is seen as egocentric, subconscious, incommunicable, and aimed to satisfy desires.

c) Functionalism: An alternative is offered by Vygotsky's conception of dialogical development (Vygotsky, 1986). In Vygotsky's view, primary pseudoconceptual thinking aims at interaction with other people, so that the earliest speech of the child is already social. So, the outward interpsychological relations become the inner intrapsychological mental functions. In this way, for the child, perceiving the world equals acting in it. For Vygotsky, egocentric speech in children plays a role in child activity in the sense that verbalisation helps action. However, egocentric speech is not seen as an autistic phenomenon, because it follows dialogical discourse patterns. Vygotsky concludes that the social function of language, as well as discourse and communication strategies, is learnt previously to the egocentric speech phase, this being only a resource to help action.

Recent research in language acquisition gives support to both the Vygotskyan approach in Psycholinguistics and the hermeneutic approach in Philosophy. Bowerman (1996, 1997) shows the patterns of acquisition of English and Korean spatial concepts in two-year-old children. Initially, the spatial concepts of children are vague. The usage of language prompts the progressive acquisition of more subtle meanings. Contrary to a widely held view according to which children assign to spatial words their preconceptual conceptions under the guidance of both built-in perceptual sensitivities and explorations (Johnston & Slobin, 1979; Slobin, 1973), this new evidence shows striking differences in the way space is structured for purposes of linguistic expression. Bowerman states that:

To the extent that languages differ, non-linguistic spatial development alone cannot be counted on to provide children with a *conceptual packaging* of space they need for their native language. Whatever form children's non-linguistic spatial understanding may take, this understanding must be applied to the task of discovering how space is organised in the local language. (Bowerman, 1996: 386)

Nonetheless, Bowerman acknowledges the temporal priority of certain non-linguistic spatial knowledge (what will be referred to in this dissertation as preconceptual image-schemas) over linguistic spatial knowledge which is language specific (what will be referred to as *conceptual image-schemas* and meaning specialisation).

1.4   Issues in Anthropology, Neuroscience and AI

Bowerman's results relate to a revival of the Whorfian view of culture and language (Kay & Kempton, 1983) within the field of Anthropology. Cultural and linguistic relativity find evidence in conceptual metaphor and metonymy systems, which differ across languages. The extensions of meaning described in the later chapters of this work respond to this view. In other words, metaphorical meaning extension patterns are specific for each language and, therefore, for each culture. Analysis of English metaphorical and metonymic extensions of meaning is assumed to show cultural specificity of the English speaking world.

The rejection of innate knowledge of language is compatible with the interconnectedness of cognitive abilities. A connectionist view of the brain in Neuroscience gives support to this approach. In this vein, Damasio (1994) shows clear evidence of the fact that feelings and reason are intermingled and mutually dependent. Damasio shows that certain types of brain damage affect attitudinal and affective capacities whose absence mars the intellectual capacity of individuals in certain respects.

Finally, present models in AI aim at superseding the classical models based on sequential processing. New models like Parallel Distributed Processing (Rumelhart et alii, 1986) and Analogical Modeling (Eggington, 1995) try to simulate connectionist systems like that which a connectionist view has of the human brain. This is why they are metaphorically called

neural networks. At present, these models cannot fully simulate brain functioning. They are based on the idea that by providing input items as well as the expected output items the system itself could learn how to reach these output items. It is still unknown whether these models will be able to simulate the way our brains process polysemy.

1.5   Mental Representations

The debate on mental representations is most relevant for the conception of linguistic meaning, since the nature of cognitive functions depends on the structure of the symbols that are applied. Following Millán Jiménez (1993: 108), I assume that mental representations are the explanation of how the mind works. Now, the real issue is what the ultimate nature of those representations is. Two trends of thought diverge with respect to the explanation of this question. One defends propositional representations, i.e. symbols organised propositionally, and the other one postulates that representations rest upon symbolic units understood as images, i.e. representations would be analogous images to reality.

a) Mental Representations as Propositions

Propositional representations refer to knowledge structures used by individuals in mental processes such as memory, reasoning, problem solving, perception, pattern recognition, and image formation and interpretation. Following Anderson (1978) such propositions are defined by four characteristics:

1) They are analytic units, i.e. they imply an arbitrary relationship, and not an isomorphic or analogic one with the represented reality. They consist of the conceptual system of relations that conform the data base and the effective consequence of the subject's mental functions. They are abstract knowledge units that come from analysis and abstraction.

2) They cannot be identified with images or perceptions as given by sensorial modes, hence their supramodal character.

3) They possess a truth value. They are functions that take as an argument a state of affairs, and are able to provide a truth value for it.

4) They possess defined and explicit formation rules that allow us to determine what is a well formed proposition. These rules have to correspond to the subject's real processes. Their grammar is a mental grammar.

Theorists who follow these characteristics try to find a universal language for thought. This language is based on a formalism upon which they can perform mental computations. The representations of the model are analytic formalisations functionally equivalent to the subject's procedures and representations. The main defender of this view is J. A. Fodor, on whose ideas is based the Chomskyan programme for linguistics and its derivations. Fodor (1975) posits that the mind is a set of functions conveniently applied to certain arguments. The cognitive system is a computational device that works with discrete units, and independently of neurophysiological functions. Following the Cartesian scheme, Fodor postulates innate ideas. He makes a strong critique of the empiricist and behaviourist tradition. His is a functionalist conception, since the psychological constitution of a system does not depend on the material support, but on the logical one. The mind is a functional structure with independent modules genetically determined, and associated to differentiated neural structures that are computationally autonomous. In that system, cognitive activity consists of symbol manipulation. Symbols are abstract entities that do not bear any configurational relationship with the entities that they denote, but maintain a correspondence with lexical units of natural language. Propositional representations are built by means of these abstract symbols. A representation is a function and the way of expressing a function is by means of a language. It is useful, then, to consider a propositional representation as an expression of a mental language that has a syntax and a semantics (the language of thought). This mental tongue is needed to explain the creativity of superior cognitive functions. It being innate, people are born with a complete set of representations upon which they can project the new information that emerges from their experience of the world. It is previous then, and necessary, to the acquisition of particular natural languages. Images can be built upon propositional descriptions, but images do not introduce new information.

Johnson-Laird (1983) applied a soft version of this theoretical framework in his theory of mental models, where he allows for a certain kind of isomorphism: "The structures of mental models are identical to the structures of the states of affairs, whether perceived or conceived, that the model represents" (Johnson-Laird, 1983: 419). An *abstract semantics* is possible – an explicative theory of human understanding – a valid reasoning based on the construal and managing of mental models. The origin of mental models is in our imaginative and perceptual capacities. The brain is considered as a system of information processing which models the environment. These models can be reproduced in computers. Johnson-Laird's model supposes an advance in the direction of linking language with other cognitive functions.

b) Mental Representations as Images

This approach claims that thought is organised as images. For those who defend this view (Bugelski, 1970; Sloman, 1971; Paivio, 1971; Kosslyn & Pomerante, 1977; Shepard, 1978) an image is different from the mere representation of propositions, and this implies four principles:

1) Mental processes underlying an image are similar to those underlying an object perception, a drawing or a picture.

2) An image is a coherent and integrated representation where each element of the represented object occurs only once, and there is easy access to its relations to other elements.

3) The image is susceptible to continuous mental transformations, such as rotations or expansions, where intermediate states correspond to intermediate states of a real object that undergoes the same physical transformations. So, a change in the image corresponds to a change in the object or its appearance.

4) Images represent objects. They are analogic forms, since structural relations between parts of the image correspond to those between parts of the object. There may be an isomorphism between image and object.

In the case of propositional representations, knowledge would be susceptible to being submitted to formalisation through Logic, and it would have a propositional nature. In the case of image representations, knowledge could be represented in the form of images that are manipulated and, eventually, can also be propositionally represented in the mind. The first approach deals mainly with syntactic facts, which can be conveniently formalised in a logical, computerisable code. On the other hand, if the aim is to give a coherent and explanatory account of natural human language, the second approach widens the scope of research to Semantics. Furthermore, defenders of the second view claim that syntactic facts can also be explained from a semantic approach. As Hernández-Sacristán puts it:

> ...the semantic component of a formalized language presupposes a previously constituted syntactic component. The situation in a natural language is entirely different since we cannot say in this case that syntactic functions exist apart form [sic] their semantic content, that syntax can be constituted, as itself, without semantics; in fact, much of what may be called the iconic component of signification has a syntactic nature. (Hernández-Sacristán, 1992: 25-26)

This idea is reflected in recent work in the fields of syntax and morphology that has brought into vogue concepts like grammaticalisation (or grammaticisation) (Traugott, 1988; Bybee, 1985; Traugott and Heine, 1993), or iconicity (Haiman, 1985). The connection, and lack of boundaries, between syntax and semantics is further shown in diverse studies on polysemy and semantic change (Sweetser, 1988, 1990).

1.6 Assumptions and terminology in Cognitive Linguistics

Cognitive Linguistics finds a theoretical milieu in Cognitive Science in its connectionist trend. It assumes that all aspects of cognition are integrated in a single interconnected whole.

Thus, language as a capacity has a non-specialised origin. On the other hand, language is clearly dependent on experiential factors, and it is bound up with psychological phenomena. Hence, the centrality of meaning in Cognitive Grammar (henceforth CG), and the crucial role of symbolisation in linguistic description. This kind of description should ban artifactual strategies like omission of certain phenomena or addition of theoretical constructs that do not correspond to data. On the contrary, a linguistic description should deal with data in their own terms, with full regard to their complexity and richness. This implies the naturalness of linguistic descriptions which harmonises with the prototype theory of categorisation, and accepts the principle of fuzziness for category boundaries. Semantic categories are seen as integrated systems and not as clear-cut categories describable in terms of binary features. Cognitive Linguistics descriptions have a commitment to factuality in the sense that, even if economy is desirable, a whole account of real phenomena must be pursued.

In CG a language is a structured inventory of conventional linguistic units[9]. A description of that language can be referred to as its Grammar in a generic sense, including all those aspects of cognitive organisation in which resides the speaker's knowledge of linguistic convention. These aspects include both Syntax and Lexicon. Syntax and Lexicon are not considered as separate components, since both of them symbolise and structure semantic content. In this vein, the treatment of units as lexical or grammatical is a matter of degree, so that lexical classes grade into grammatical ones, segregation being an artifactual device. The type of units analysed in this work are proximal to the grammatical zone, in the sense that certain uses as prefixes, suffixes, or verb-particles make them similar to grammatical morphemes. Nevertheless, their lexical character is predominant in their use as heads of prepositional phrases and as adverbs. In addition, their traditional consideration in dictionaries as separate words, even with polysemic distinctions, makes them more similar to *lexical* rather than to *grammatical* units[10]. All in all, though they are predominantly lexical in character, this does not preclude their grammatical use in several constructions, a fact which provides evidence for the continuum hypothesis between Lexicon and Grammar.

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[9] (Cf. Langacker, 1987: § 2.1.4 and § 2.1.5)
[10] However, this is not a unanimous agreement among linguists (cf. ch. 2).

The term *unit* as it has been used in previous pages and henceforth has certain psychological implications. Following Langacker, a *linguistic unit* is regarded as "a thoroughly mastered structure, i.e. one that a speaker can activate as a preassembled whole without attending to the specifics of its internal composition" (Langacker, 1991 *b*: 15). An expression is considered as a unit if it is conventional in a linguistic community, but bearing in mind that no two speakers control precisely the same set of units, and that the semantics of a unit is encyclopaedic in character. Thus, two speakers may control different specifications of the same unit, and use it to refer to different domains. In addition, novel uses of an established unit cannot be algorithmically derived, but are the result of problem-solving activity on the part of the language user. A novel use, or a semantic extension, requires a categorisation judgement which sanctions the use of the given unit in the new context. The new context will provide new semantic specifications for the unit in question, which require at least partial sanction of the previously existing -conventional- specifications (Langacker, 1987: cf. 2.1.4.). At the same time, units consist of a phonological pole and a semantic pole (in the purest Saussurian tradition). The semantic pole of a unit is the semantic structure of that unit, also called *predicate* or *semantic category* in CG, and it is represented in capital letters. E.g. the lexical units *at, on,* and *in* correspond to the predicates, semantic categories, or semantic structures AT, ON, and IN. The meaning of any expression (no matter whether it is a unit or not) is called *predication* in CG, e.g. the meaning of the expression 'I wanna be cool' is its predication.

AT, ON and IN are relational predicates. The nature of relational predicates requires two further entities in the predication where they appear, namely the trajector (tr) and the landmark (lm). On the basis of a gestalt configuration of the conceptualisation, the trajector is the profiled element and the landmark provides the frame of reference or background for the localisation of the trajector. The predicates AT, ON, and IN, being relational, always require a trajector and a landmark, though these might remain unspecified.

Finally, the term *entity* "subsumes anything we might have occasion to refer to for analytic purposes: things, relations, boundaries, points on a scale, and so on." (Langacker, 1991 *b*: 21).

2. THE SYNTAX OF AT, ON AND IN

2.0   Introduction

The existence of a class of *prepositions* is in general accepted. However, problems arise as soon as linguists try to find a definition of the category as such (Ljunggren, 1951), to establish an inventory of its members (Vestergaard, 1973), to determine their functions (Verguin, 1967), and to draw their category limits (Roegiest, 1977; Jacobson, 1977; Plann, 1988; Rauh, 1990; Foskett, 1991; König & Kortmann, 1991). For the English language a comprehensive list of items could amount to 180-190, including simple and complex prepositions (Quirk et al., 1985: 665-671). The class is by no means a closed set, but admits of new additions, and constantly changes its range.

In this chapter I review the main proposals of general linguistic theory for a definition of the syntactic category of prepositions (cf. 2.1); I present the standard description of that category for English (cf. 2.2), and a solution for the syntactic categorisation of particles (Sroka, 1972). I, then, introduce different theoretical proposals from the Anglo-Saxon world, which try to incorporate semantics to linguistic description (cf. 2.3). Finally, I propose an alternative account as a continuum, in order to find a place for *at, on* and *in* along the continuum. This proposal is based on Langacker's Cognitive Grammar, whose relevant notions are also introduced (cf. 2.4).

2.1   General theories on the category of prepositions

2.1.1   Traditional Grammar

In the Aristotelian tradition, some words were referred to as συνδεσμοι (*sýndesmoi,* i.e. link-words), because they were viewed as links between other words. That word class included conjunctions, articles, determiners, as well as prepositions. Dionysios Thrax was the first

grammarian who considered them as distinct and separate classes. He called πρόθεσις (próthesis, i.e. placed before) one of these classes, marking some limits for the category as a distinct part of speech, providing a definition for it: "a part of speech placed before other words in composition or in syntax"[11]. This conception gave origin to the Latin term which is preserved in many of our modern tongues: *praepositio*.

The class of prepositions has been traditionally characterised from three points of view:

1) Morphologically, prepositions have been regarded as invariable words that do not undergo inflectional processes.

2) Syntactically, they have generally been defined as *preposed words*, hence their name.

3) From the point of view of logic, they have been regarded as sense modifiers: *significationem aut mutat aut complet aut minuit* (E. Donatus[12]), or just as link words – following Aristotle –, being included in the same class as co-ordinators and subordinators. All in all, prepositions have been considered as items that express relations. This conception agrees with the tradition initiated in the XVIth century by J.C. Scaliger[13], who perceived the extreme abstractness of prepositions in many contexts. Following Descartes' philosophy and doctrine of innate ideas, the Port Royal Grammar[14] set up a tradition whereby each word had only one very abstract sense independently of any context. Consequently, each preposition should express an abstract type of relation regardless of its spatial, temporal or abstract character. Prepositions were defined for the first time as the general expression of relation. Theories of prepositions as case markers are inspired on this idea. Another trend emerged in Britain, where empiricism overshadowed logicist positions. In this vein, Locke's doctrine on the origin of concepts states that these originate in sensorial perception[15]. The idea came about that the original sense of prepositions is the concrete or spatial one, whereas other senses – temporal, modal, or abstract – would derive from the primitive spatial sense. This is the localist tradition, on which experientialist theories of meaning are founded.

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[11] Dyionisios Thrax **Tecnh Grammatikh**, in Bekker, I. *Anecdota Graeca*, Berlin, 1816, 1627-43. Quoted from Robins (1990: 39).
[12] E. Donatus, *Ars Grammatica*. Quoted from Brøndal (1948: 48).
[13] J.C. Scaliger 1540, *De Causis Linguae Latinae*.
[14] Lancelot C. & Arnauld, A. 1660, *Grammaire Générale et Raisonée*, Paris: Port Royal.

Altogether, Traditional Grammar has influenced linguistic theory of the twentieth century, as well as contemporary notions of categories. The following sections show different attempts to provide a definition for the class of prepositions.

2.1.2   Hjelmslev's Government Theory

Hjelmslev (1935) distinguishes two general functions in any grammatical system: *subordination* and *government*. *Order* and *government* are the formal traits that provide criteria to determine when and between which elements subordination occurs. Hjelmslev establishes a categorial rank scale (Jespersen's tripartition: cf. 2.1.4) on a purely formal basis. *Government* expresses the syntactic dependence of some elements on others, as well as the character of that dependence. The following distinction is made:

Pure government: This is called *concordance* or *agreement*. The ending of the dependent element only shows the syntactic relationship, and it does not indicate any meaning of the term that is governed (gender, number, person and case). Two types of agreement can occur, pure and complex. In pure agreement the primary rank term (noun) governs the secondary rank term (adjective), e.g. *ars magna*. In complex agreement, however, the secondary term can govern the primary term, e.g. *occidere hominem*. Terms of third rank (adverbs, prepositions, subordinators) are not affected by either type of agreement.

Complex government: This is the only domain where third rank terms can have a function, whether as governed term, e.g. *he speaks quickly*; or as governing term, in languages with nominal case inflection like German, e.g. *ins Kino* vs. *im Kino*.

First rank terms can either govern or be governed − *ars magna* vs. *occidere hominem*. Second rank terms can govern either a first rank term − *video hominem* − or a third rank term − *latine loqui* −.

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[15] J. Locke 1690, *An Essay Concerning Human Understanding*.

Within this system of subordination categories, prepositions are third rank terms that can only perform a function in the scope of complex government, and they do it as a governing term. The class is then defined within the scope of syntax and syntactic function. Hjelmslev conceives of prepositions as governing terms because he takes as a basis the Latin language, where the diverse case endings are governed by prepositions. He identifies both categories, case and preposition, on the grounds of comparison between languages with and without cases. According to Hjelmslev, the latter group of languages use prepositions for the expression of case meanings, so that he uses his theory of case in order to determine prepositional meanings. A universal logical scheme is designed on the grounds of a classification of the conceptual meaning to be expressed. He arrives at the conclusion that in Indo-European languages prepositions express directional meanings, i.e. spatial relations.

To sum up, Hjelmslev conceives of prepositions as third rank terms in the system of subordination categories, and as governing terms according to government categories. Since they have a function in complex government, they express the nature of the dependence with regard to the related terms. This nature is that of spatial relations. Thus, prepositions express spatial relations between objects. Their temporal or abstract meanings are secondary.

2.1.3 Brøndal's logical conception

Brøndal (1948) conceives of the logical foundations for word classes as universal, given that language reflects thought. This author builds his classification of parts of speech on four fundamental logical concepts that he deems equally necessary for thought and language:

Substance: Relatum (R)
Relation: Relator (r)
Quantity: Descriptum (D)
Quality: Descriptor (d)

Particular combinations of these concepts characterise the set of parts of speech in a given language. The following categories are possible:

a) Abstract classes: Prepositions (r), Proper Nouns (R), Numerals (D), Adverbs (d).

b) Specific classes: Nouns (Rd), Conjunctions (rD), Verbs (rd), Possessives (rR), Pronouns (RD), and Reflexives (Dd).

c) Complex classes: Situational Verbs (Drd), Situational Nouns (DRd), Possessive Nouns (rDR), and Verbal Adjectives (rdR).

d) Indefinite class: Interjection (DrdR).

Each language combines the four fundamental universal concepts on its own, in the sense that none of these classes is universal − except for the Interjection. Brøndal does not at all use structural features (syntactic or morphological). He defines the word as the union of a phonetic element and a logical element. Therefore, the logical concept of *Relation* defines the word class of prepositions. Prepositions are words that express a pure relation, and that is their function, without any direct regard to objects or situations:

> ...la seule fonction des prépositions véritables est d'établir un rapport, et dans cette mesure, une liaison, par ex. entre deux termes (mots ou propositions). [...] la relation doit être entendue comme étant de nature purement logique et point necessairement syntaxique. (Brøndal, 1948: 50).

For Brøndal, prepositions, conjunctions, and adverbs are separate classes, each one being determined by a different logical combination. Prepositions are conceived as having a unique and very abstract sense, even though their different syntactic uses are also acknowledged. If they occur in the function of an adverb, adjective, or other functions Brøndal calls them 'false preposition' (Brøndal, 1950: 23).

The class is defined according to logical categories of relation:

a) Symmetry: Every relation requires two terms, and it can be reversed or not.
b) Connection: Both terms are linked and solidary.

c) Transitivity: The relationship goes from one to the other.

d) Variability: A relation can be held between groups or between individuals.

e) Plurality: A relation between an individual and a group.

f) Generality: This category depends on the arbitrariness of the elements related.

Prepositions are elements that make it possible for this kind of relationship to exist – pure relation –, leaving out any other semantic considerations:

> Les prépositions expriment donc des relations pures sans égards directs à des objets (R) ou à des situations (D) . Elles ne sont donc à aucun point de vue, pas même au plus abstrait, locales ou spatiales. Elles n'ont en elles-mêmes rien à faire avec l'espace, ni donc avec le mouvement ou le repos. (Brøndal, 1948: 89).

2.1.4   The Functionalist conception

2.1.4.1 Rank Theory

Rank theory refers to the syntactic function of words in the clause (Jespersen, 1924). Nouns belong to the first rank, since they do not depend on other clause elements. Verbs and adjectives obtain second rank status, as long as they depend on nouns. Adverbs, conjunctions, prepositions and interjections are gathered into the third rank, thereby being considered as elements of the same class. They depend syntactically on verbs or adjectives, which are second rank elements. Lack of inflection is the morphological feature common to all of them. For Jespersen, there is no reason to distinguish between prepositions and conjunctions. The argument runs that, in spite of usually having different complements, these two groups are exchangeable.

2.1.4.2 Dependence Grammar

Tésnière (1959) regards prepositions as basic elements for the *Theory of Transfer* (*Théorie de la Traslation*). Tésnière's first distinction separates *Full Words* from *Empty Words*. The

former play semantic functions; the latter add precision to or transform the category of *Full Words,* and regulate relations among them. At the structural level the following distinctions are made:

a) *Constituent or full Words*: They form nodes bound to undertake a structural function. They are morphologically variable.

b) *Subsidiary Words*: They do not perform structural functions. They lack autonomy, and are morphologically invariable. Within this group he posits a further subdivision:

1.- *Junctives*: They link *Full Words* or nodes. They are internuclear (coordinators). Junction is a quantitative phenomenon, in the sense that it results in the addition of syntactic structures.

2.- *Traslatives*: They are morphological transfer markers (subordinators, relative pronouns, prepositions, articles, auxiliaries, grammatical endings). They are intranuclear (they affect the phrasal head or node).

Transfer consists in changing the grammatical class of a *Full Word.* There is a change of category and a change of function. It is a merely syntactic phenomenon, in the sense that *Full Words* change their syntactic function, but not their form. Tésnière claims that traslatives do not possess any defined semantic value, but only a rather general structural value. In order to understand the nature of such a general value the intranuclear character of *Traslatives* has to be pointed out. Thus, in the phrase *of rain* the traslative *of* is part of the head. There is a distinction between *first degree transfer*, where the head is an element in a simple sentence or clause, and *second degree transfer*, where the head is a verb phrase. Prepositions are *first degree transfer* markers. Subordinators are *second degree transfer* markers. Tésnière does not ascribe any semantic value to prepositions or to subordinators, which are just structural elements with a particular function: marking *first and second degree transfer,* respectively. Adverbs are a separate class and have lexical meaning, as heads of adverbial phrases (*Full Words*).

2.1.4.3 Martinet's Functional Grammar

Martinet (1985) adopts the notion of *moneme* for the characterisation of syntactic categories. *Moneme* is defined as a *sense effect* that corresponds to a *formal difference* (Martinet, 1985: 33). Martinet distinguishes between bound (*conjoint)* and free (*libre) monemes*. The former appear in complexes that behave as single *monemes*, and the latter occur independently in their syntactic relations. Prepositions are a type of *free monemes* called *functionals* (*fonctionnels*). They need the presence of two other *monemes* which bear a relationship. If one of these *monemes* is omitted, then the *functional* is transferred to the category of adverbs. Both prepositions and conjunctions are considered as the same type of *functional* (Martinet, 1985: 166).

2.1.5   The Structuralist conception

2.1.5.1 American Structuralism

Bloomfield (1933) includes prepositions as one of the parts of speech, different from subordinators and adverbs. These word classes are not defined in terms of their correspondence with different aspects of the practical world, but merely by their positions in syntax. Linguistic categories are defined therefore in formal terms. This makes it impossible to describe their meanings (Bloomfield, 1933: 271). Prepositions are considered as *free forms,* and constitute a *form-class*. According to Bloomfield's description of *endocentric* versus *exocentric* construction types, prepositions are *linguistic forms* that determine *exocentric* constructions, since the syntactic role (position) of the resultant *linguistic form* (a Prepositional Phrase) is different from the syntactic role of the preposition itself (Bloomfield, 1933: 194).

2.1.5.2 European Structuralism

Pottier (1962) offers a deep analysis of syntactic elements that perform relations in the clause. This linguist posits a common linguistic nature for prepositions, adverbs, and subordinators. They are considered to be variants of the same relational morpheme. In Pottier's view prepositions are particles that link an element A to another element B, which is not always explicit, according to the following formula: *A - (R - B)*. The link *R - B* is stronger than the link *A - R*. Pottier sees prepositions as each having a unitary value in a particular language. They can express distance or closeness to a limit that is introduced by the speaker in his particular use of language. The fundamental sense of prepositions is, according to Pottier, the expression of some type of relation. This meaning is independent from discourse, where prepositions acquire a variety of nuances of meaning.

2.1.6   Summary

So far, we have seen that prepositions are conceived of as:

a) A governing element in the scope of *complex government* (Hjelmslev).

b) A logical-semantic category with a unique sense as *relator* (Brøndal).

c) A structural functional element as *transfer marker* (Tésnière) or *function marker* (Martinet).

d) A *third rank* word that belongs to the same syntactic-semantic category as adverbs and subordinators by virtue of their exchangeability (Jespersen).

e) A *free linguistic form* that constitutes the head of certain *exocentric constructions* (Bloomfield).

f) A *relational morpheme*, which is identified with adverbs and subordinators, and possesses a unitary sense in each particular language (Pottier).

Hjelmslev ignores the semantic structure of prepositions as well as the fact that the same unit can be transitive or intransitive in different contexts. Conversely to Brøndal's view, I suggest that each preposition displays an array of senses different from the other prepositions, and the set of senses for each preposition, in turn, shows a coherent polysemous structure. In contrast

with the functionalist position, I claim that prepositions are full lexical units. Jespersen's exchangeability is not real, because exchange cannot be performed without modifying the context, as we see in these examples:

(a)   Everybody came to my party, but Peter.
(b)   Everybody came to my party, but Peter <u>didn't</u>.

I would reject the idea that they belong to the same class by virtue exchangeability. American Structuralism bases all its descriptions on purely formal patterns, thus ignoring meaning. Pottier's view, like Brøndal's is not compatible with the polysemy shown in later chapters of this work.

2.2   The category of prepositions in English

2.2.1   Grammatical description

Sweet (1900)[16] used the three traditional criteria – form, function, and meaning – in order to characterise prepositions and adverbs. For Sweet, morphology and meaning are not distinctive, since both word classes can have spatial meanings and their forms coincide in many cases, neither of them being an inflectional category. He uses the functional criterion to differentiate these categories. Function is determined by their "position in the sentence with regard to other parts of speech and the role one word plays in relation to another (e.g. the relation of government)"[17]. The function of prepositions is to make the noun-word it governs into an adjunct-word[18]. With respect to their position Sweet already points out the positions of deferred prepositions in English. However, he acknowledges a functional overlapping with adverbs by signalling a group of words that can perform both functions,

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[16] Sweet, H., 1900, *A New English Grammar: Logical and Historical. Part I: Introduction, Phonology and Accidence*. Oxford. (1st 1892). Reference from Sroka (1972).
[17] Quoted from Sroka (1972: 108).
[18] Sweet (1900: 136); quoted from Sroka (1972: 11).

the adverb-preposition words. After Sweet, the categorial distinction between these two classes has been a frequent issue in English linguistics[19].

Quirk and his associates also characterise prepositions in English according to syntactic or functional criteria (Quirk et alii, 1985: 658 ff.):

a) Prepositions cannot take a subordinate *that*-clause, an infinitive clause, or a subjective form of personal pronouns, as complements. Those prepositions that normally cooccur with certain verbs and adjectives are omitted before a *that*-clause or an infinitive clause.

b) On the one hand, prepositions share their connective function with subordinators, and on the other hand, they share a semantic value and formal identity with some adverbs.

A criterion for differentiating between prepositions and subordinators is that the former introduce nominal or nominalised complements, whereas the latter introduce subordinate clauses, which are characterised by having verbal heads. Both can introduce *-ing* forms of verbs, since these forms present both verbal and nominal functions.

The adverbial nature of an expression is determined by the option of omission, substitution by other adverbs, or change of position. Two linguistic entities are identified as intermediate − between Preposition and Adverb −, even though no definition is provided at all: *adverbial particles*, which occur with phrasal verbs (e.g. *She looked up the word*), and *prepositional adverbs*, which lack a nominal complement (e.g. *She walked across*).

The phenomenon of deferred prepositions is referred to as 'special syntax' by these authors. Usually, prepositions precede their complement, but there are some circumstances in which this is not the case. This phenomenon occurs with prepositional verbs in passive constructions where the subject corefers with the prepositional complement[20]. In that context the preposition remains next to the verb (e.g. *Has the room been paid for?*). This also occurs in infinitive and *-ing* clauses with thematisation of prepositional complements (e.g. *He is*

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[19] See the historical review by Sroka (1972: 102ff.), as well as Fernández-Fernández (1978, 1979).
[20]For a comprehensive account of this and other types of passive constructions with prepositional and phrasal verbs see the study by M.C. Campoy Cubillo (1995).

impossible to work with; He is worth listening to). In interrogative and relative clauses there is a formal construction, where prepositions precede the pronoun (e.g. *To whom were you speaking?*), and an, according to Quirk, informal construction, where prepositions occur at the end of the clause (e.g. *Who were you speaking to?*). As for meaning, Quirk's Grammar only mentions the similarity to adverbs.

2.2.2   Problems arising from the grammatical description

According to Quirk's description, elements such as *over* would belong to three different categories, namely Preposition, Prepositional Adverb, and Adverb Particle. Something similar happens with units such as *for*, which would be preposition and subordinator. This shows that most of the units traditionally called prepositions do not behave as such in a homogeneous way. In spite of that, grammatical descriptions introduce the category as having a homogeneous syntactic behaviour. This brings about the problem of syntactic categorisation which arises when various functions converge in a single linguistic unit. This convergence may lead the theorist to specify diverse lexical entries in the lexicon for each single morphological element.

2.2.3   The problem of syntactic categorisation

Certain fundamental features that could define the category under analysis can be traced in the theories reviewed above:

a) Prepositions are elements that modify the syntactic function of the lexical unit they introduce (Tésnière's *traslatives*).

b) Prepositions have a linking function (Brøndal's *relators*).

c) Prepositions govern nominal cases (Hjelmslev's governing terms).

d) Prepositions have adverbial meanings (Pottier's unitary senses).

None of the three syntactic features, a) to c) above, appears in all instances of all English prepositions, because many of these can also occur as adverbs or subordinators. In order to be homogeneous, the category should be reduced to a small group of units that do not appear as adverbs or subordinators, such as *of*, *to*, *at, onto, into, with*, and *from*. If we also take into account that prepositions have adverbial meanings, then we should have to exclude *of* and those uses of *to* that are non-spatial (to + infinitive, to + purpose complement, and to + I.O.). In the latter case a single lexical entry for *to* would only be feasible if one assumes that the non-spatial uses correspond simply to prefixes, as in *to-go,* and *to-you*. Given that assumption, the unit *to* would only be the preposition with a clear spatial meaning as head of PPs, as in *to the garden.* Thus, the category of prepositions would be reduced to a group of five, namely, *to, at, with, into,* and *from*. But, in that case, what of the prepositional uses of other units that would be called adverbs, like *on, by, in, over, up, out*, etc.? What of the so called complex prepositions like *in spite of*, *in respect of*, etc.? Are they prepositions as well, or just amalgamations of various different units? They certainly behave as unitary elements, and their syntactic and semantic features coincide with those of simple prepositions. If we reduce the category to such an extent we would have to postulate new categories for the units excluded. Furthermore, some of those new categories would pose the same problem, presenting hybrid elements as well.

To define the category of prepositions by only one of its syntactic features (transfer, relation, government) would be paradoxical, since the three features do characterise the central prepositions *at, with, into, onto, from*, and *to*. Moreover, such a proposal would not explain why other prepositions can perform other functions.

2.2.4   *Sroka's theorem*

A solution to the syntactic categorisation of particles is proposed by K. Sroka (1972). Sroka applies the distributionalist method of substitution (Fries, 1957), which distinguishes between lexical and structural meaning. Only the latter can be used for the definition of parts of speech, and it is to be established by means of distributional criteria:

> ...the signals of structural meaning in English consisted primarily of patterns of
> arrangements of classes of words which we have called form classes, or parts of

speech. We have assumed here that all words that could occupy the same 'set of positions' in the patterns of English single free utterances must belong to the same part of speech. (Fries, 1957: 74f.)

Sroka points out that some words are included in both class 4 (Adverbs) and group F (Prepositions), and that the positions for these classes are not clearly defined in Fries's framework (Sroka, 1972: 158ff.). This author proposes three positions which differentiate adverbs and prepositions distributionally (Sroka, 1972: 44ff.)[21]:

1) Position a: The final position, or the position preceding a final adverbial modifier, in active verbal constructions, e.g. *Why are you up so early.*

Excluded are: a) Statements in which an object precedes the subject, e.g. *That I object to*

b) Object questions introduced by *whom, who, what, which, whose*, and *where*, e.g. *What are you looking at?*

c) Object clauses introduced by *whom, who, what, which, whose, where, as, that, than*, and contact (relative) clauses, e.g. *He refused to tell me what he wanted me for; Tell me about the place you live in.*

d) Certain types of non-finite verb constructions, such us those depending on verbs heading a), b) and c) or on adjectives, e.g. *What have you got to laugh at?; There's nothing worth living for.* And infinitival phrases dependent on (pro)nouns or clauses, e.g. *I have a lot to thank you for.*

Included are: a) Non-finite verb constructions that depend on a verb which is not the head of exceptions a), b), or c), e.g. *It's trying to push past.*

b) Participial phrases dependent on a (pro)noun which does not depend on a verb heading exceptions a), b), or c), e.g. *His hand was a bird fluttering in and out.*

2) Position b: The position preceding the personal pronouns *me, him, us* and *them,* as well as *her, it*, and *you* when these are final or preceding a final adverbial modifier in the immediate verbal construction, e.g. *Two young officers paused as they looked at her.*

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[21] Examples are taken from Sroka (op.cit.); see this author for references.

3) Position c: The position between the verb and the noun, or noun-group, object, e.g. *When the Roman Legions gave up the Great Wall, sir, our people broke down the gates and came through.*

According to these positions, Sroka classifies a set of English particles into three categories:

1) Adverbs (A-words): They occur in positions a and c: *away, back, forth, forward, out.*

2) Prepositions (P-words): They occur in positions b and c: *at, for, from, into, of, upon, with.*

3) Adverb-Prepositions (AP-words): They occur in positions a, b, and c: *about, across, along, by, down, in, off, on, over, past, round, through, to, under, up.*

Following Sroka, *at* would be a preposition, since it occurs in positions *b* and *c*, whereas *on* and *in* would be AP words, since they occur in positions *a, b* and *c.*

Sroka's proposal seems to solve the issue of the syntactic distinction between prepositions and adverbs by positing an intermediate category of units that perform both functions. He neatly defines three distinctive positions where these categories occur. However, the set accounted for by Sroka is rather limited, and the positions analysed do not cover the whole range of positions where some of these units occur. For example, Sroka (1972: 75) comments on a position where the three categories occur, i.e. in final position in passive constructions. Or, the prefixal position can take some AP words (*by-pass, downtown, intake, offset, overrun, oncoming, underwear, upset*), but not others (*about, across, along, past, through, to*). On the other hand, semantic structure of particular units is not considered (lexical meaning, in Fries's terms). Structural meaning is considered only partially, since function equals position with respect to other elements, but not the role with respect to them (government, transfer, or linking). As a consequence, there is a certain circularity in Sroka's definitions; for instance, adverbs are characterised as occurring in position *a*, and position *a* is characterised as one where adverbs occur (Sroka, 1972: 75); if a unit does not occur in position *a*, the reason adduced is that it is not an adverb. In the same way, a position qualifies as position *b* if only prepositions, but not adverbs, occur in it, whereas the exclusive feature of prepositions is that

they occur in position *b* (Sroka, 1972: 83) The determinants of the syntactic function of the particle are (Sroka, 1972: 91):

1- The distributional category, in the case of A-words or P-words.

2- In the case of A-P words, the phonemic features of the verb, the lexical meaning of the verb-AP collocation, and the grammatical meaning of the construction consisting of a verb-AP collocation and an object.

Sroka does not discuss in which way the particle affects the lexical meaning of the verb-AP collocation. In the discussion of grammatical meaning, he distinguishes between *transitive* and *intransitive* verbs, but the meanings of these terms are not accounted for semantically. On the contrary, a certain position requires transitivity, and transitivity occurs when that position occurs (again a tautological argument).

As a conclusion, Sroka's theorem is coherent as a formal system, but it needs to turn to lexical meaning and grammatical meaning to explain why a particular syntactic function occurs, i.e. what is meant by speakers when they use a prepositional construction as opposite to an adverbial construction. The distributional framework (Fries, 1957) does not provide the adequate tools in order to give a semantic account of syntactic function. As Fernández-Fernández points out:

> ...la conjunción de las dos orientaciones o tipos de criterio (de orden SEMANTICO y de orden FORMAL) es absolutamente necesaria, si hemos de entender correctamente la naturaleza, estructura interna y la esencia misma de estas *unidades lingüísticas...* (Fernández-Fernández, 1979: 220).

2.3   On the search of the semantic component

Below, I present several views that make an attempt to introduce the semantic component in linguistic description starting from a previously established syntactic component.

2.3.1   Generative Grammar

In the semantic component of Generative Grammar (GG), the lexicon specifies the abstract morpho-phonological structure of each lexical item and its syntactic features, including its categorial features and its contextual features(Chomsky, 1965). Prepositions are considered as a lexical category, head of PPs. So, a by_1 preposition, as in *sit by the table* is distinguished from a by_2 adverb, as in *stand by,* as well as from a by_3 agentive case marker in passive constructions, as in *The window was opened by the janitor.* Particles of phrasal verbs are kept apart, because they are accounted for as semantically empty forms integrated with the verb stem. Prepositions following prepositional verbs, as well as complements of motion verbs, are specified by means of verb subcategorisation, which is also a part of the information provided by the lexicon in a GG. Therefore, all these uses are excluded from a syntactic or semantic account of prepositions. Those units that can be considered as *case forms − of, to, by*, *with −* are reduced to mere syntactic markers without any meaning, and are considered to be selected in an arbitrary way.

This grammar refuses to give a semantic account of all uses which are not a preposition as a head category in the scheme : P + NP.

2.3.2   Case Grammar

Case Grammar (Fillmore, 1968 *a*, 1968 *b,* 1977) views prepositions as case markers. Their governing function (in Hjelmslev's terms) is emphasised. The correspondence between case and preposition is arbitrarily given by the lexicon. That correspondence is not explained by prepositional semantic structure. Therefore, prepositions are accounted for as mere morphological markers, similar to Latin cases.

The same item needs two lexical entries, one for the adverb and another for the preposition. This grammar can thus never explain why prepositions are so similar to adverbs semantically, because case assignment is arbitrary.

2.3.3 Government and Binding Theory

Chomsky (1981: 48) denies the lexical character of prepositions. Prepositions are defined as a non-lexical category [-N, -V]. In spite of this, posterior accounts within the Government and Binding (GB) approach (Bierwisch, 1988) still acknowledge the lexical character of the category, and postulate its function as head in PPs. Nevertheless, Bierwisch posits grammatical features for prepositions (+/- directional, and Case), which are caused by verb subcategorisation, and must be kept separate from semantic properties (Bierwisch, 1988: 2). For this author, treating the category Preposition as lexical is in some sense problematical, since prepositions constitute "comparatively restricted sets not available for productive patterns of word formation" – as is the case for other lexical categories. On the other hand, Bierwisch notices an inherent affinity of prepositions to case morphemes, this distinction not being clear in many languages[22].

There is an incongruity in defending the lexical character of the category and, at the same time, comparing it to case morphemes. This is incongruent, given the categorial approach of GB, but would be utterly natural in a semantic approach.

2.3.4 Lexical Functional Grammar

An attempt to solve that shortcoming is introduced in Lexical Functional Grammar (LFG). Bresnan (1982) postulates a category of predicative prepositions as heads of PPs that modify verbs, as in *John returned home with flowers*, and a category of non predicative case markers, as in *John hit the nail with the hammer*. The latter function is less central, and closer to Fillmore's case markers. These two subcategories are linked, since case assignment to prepositions is no longer seen as arbitrary, but determined by the semantic structure of predicative prepositions. In any case, non predicative prepositions are still considered as

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[22] In English we find the alternation between morphological genitive and *of*.

grammatical elements that do not convey any semantic information. They are formal exponents of syntactic function.

It remains unexplained why the same item should be included in two different entries – one of them lexical, the other grammatical – given that case assignment for non predicative prepositions (grammatical) does depend on the semantic structure of predicative prepositions (lexical). Moreover, lexical meanings still are considered as unitary (monosemy).

2.3.5 Conceptual Semantics

Jackendoff (1983) assumes that each phrasal category (NP, VP, AP, AdvP, PP) has a head, which is a lexical category (N, V, A, Adv, P), plus a variety of modifiers (Jackendoff, 1983: 63). This author includes semantic structure in the same component as conceptual structure. Every major phrasal constituent in the syntax of a sentence maps onto a conceptual constituent that refers to one of the major ontological categories. The lexical head X of a major phrasal constituent corresponds to a function in conceptual structure. Thus, for the sentence: *the man put the book on the table*, the first attempt at conceptual structure is:

EVENT
PUT   (THING   THING   PLACE
        THE MAN,   THE BOOK,   ON THE TABLE)

(Jackendoff, 1983: 67)

The following features have universal character:

a) The distinction between lexical categories (e.g. N) and major phrasal categories (e.g. NP).

b) A system of subcategorisation in which lexical categories subcategorise major phrasal categories (e.g. put $\rightarrow$ put [V] NP PP).

In Jackendoff's view, prepositions are lexical heads that can be modified in the same way as nouns, verbs, or adjectives, and project the ontological category of PLACE. Prepositions have a syntax as rich as that of other categories in the sense that they can occur both in transitive – where they subcategorise NP, AP, PP or VP – and intransitive contexts. Jackendoff acknowledges that prepositions are meaning-bearing entities whose semantic structure can, theoretically, be matched to the argument structures of verbs. Thus, verbs and prepositions are not only syntactically but also semantically analogous.

It could be said that Jackendoff goes back to the conception held by Jespersen that the same item can appear as adverb, preposition, or conjunction. His innovation resides in acknowledging the existence of a complex semantic structure, analogous to verbs, which provides the possibility for complex syntax. The shortcoming resides in his acceptance of the centrality of syntax. Syntax – being universal – offers a grid (heads, arguments, modifiers) for semantic places or roles matched by ontological categories. In that grid, prepositions are heads. This leaves the grammatical uses of prepositions unexplained. In Cognitive Semantics, however, syntax is subordinate to semantics, and not vice-versa. This makes it possible for a unit with a coherent semantic structure to appear in different syntactic contexts.

2.3.6   Situation Semantics

Gawron (1986) builds a tentative bridge between the acknowledgement of full semantic content of all prepositions (Jackendoff, 1983) and the multiplicity of syntactic function (Bresnan, 1982). Within the framework of *Situation Semantics* (Barwise & Perry, 1983) Gawron discusses the distinction between *adjunct prepositions* (predicative) and *subcategorised-for prepositions* (non-predicative, i.e. argument-markers specified by the verb). For this author, both kinds of prepositions mark two-place relations; and both functions can be served by the same semantic content. "The semantic differences that result all reflect different ways of combining verb contents with (potentially) the same preposition content" (Gawron, 1986: 66).

Situation Semantics is based on the concept of regularities within reality, wherein regularity determines informativeness. Situations or chunks of reality are classified in terms of the facts

which have truth value in those situations. Facts are specified as relations which hold or do not hold between individuals, possibly at a location. Facts are classified by the kinds of relations having truth value, by the individuals for whom the relations are specified, and by polarities (a relation holds or does not hold between certain individuals). The semantic content of a sentence is based on these abstract situation types. In any sentence, all components have meaning. Thus, if we find a component like *at,* in *I am at the computer*, this component should bear the same content as in *I am looking at the screen.* In classifying multiple functions for a given preposition no new semantic content is appealed to. What differs from one use to another are the ways of combining functions. Four categories are postulated (Gawron, 1986: 22 ff.):

a) Argument PP's: A preposition can mark the argument of a verb only if its content is redundant with that of the verb, i.e. it shares all of its arguments with the verb. Thus, in *John gave the book to Mary* the content of *to* is redundant with the content of *give*, where *book* and *Mary* are their shared arguments.

b) Co-predicating PP's: They introduce new situational information (a new argument), but share the other argument with the verb. The PP expresses a role, in the sense that it is conceptually necessary in the event, but it is not syntactically necessary. Thus, in *They broke the window with a rock*, the PP introduces information which is not subcategorised by the verb (*with a rock*); and *the window* is an argument shared by verb and preposition. Co-predicating PP's are not semantically inherent to the verb (*The window broke*).

c) PP's as controlled complements: Prepositional arguments are required by verb subcategorisation frames, but their contents are not specified, i.e. it is not determined which particular preposition should cooccur with the verb. In *John wheeled the gurney down the hall/into the elevator/up the aisle/etc.*, the PP's are not redundant with the verb, but they specify a PATH along which the action *wheel* takes place.

d) Adjunct PP's: These take the entire situation of a clause as their argument, as in *Sarah read the book in the library*.

Gawron claims that prepositions can be treated as meaningful elements whose lexical and

nonlexical functions can be examined in a unified framework. *Situation Semantics* is based on the assumption that language stands for real true situations. Thus, a true sentence cancels other alternative sentences as false, and therefore as semantically untenable. However, if we consider meaning as a matter of conceptualisation, then a real situation could be expressed with different meanings that do not cancel each other, since the same situation may be conceptualised in diverse ways. On the other hand, the assumption that each element in the sentence has its own independent meaning would make it acceptable that each unit has a uniform and monosemic core sense. I claim that all uses of a unit are meaningful, but this fact does not prevent new contexts conferring new senses on that unit.

2.3.7   Role and Reference Grammar

Jolly (1991) assumes that an analysis of prepositional roles and their specifications in the lexicon requires the construction of a theoretical bridge between syntax and semantics. Role and Reference Grammar (RRG) is a propositional semantics model that identifies verbal argument structure through decomposition. It assigns semantic roles to arguments of predicates in Logical Structure (LS). It distinguishes *Agent* (volitional performer of a motional or non-motional action), *Effector* (non-volitional performer of a motional or non-motional action), *Patient* (a state or condition of being), *Locative* (location), and *Theme* (argument whose location is in question) as possible roles. However, the semantic relations between a verb and its arguments are not primitive relations assigned to verbs, as in Fillmore's case grammar. Rather, relations and case frames are derived from the LSs of verbs. Four types of verb LS are posited (Jolly, 1991: 71):

a) stative: **predicate'** *(x) − John is tall −*, or **predicate'** *(x,y) − John knows George −*,

b) achievement: *BECOME + stative − He died, They found the money −*,

c) activity: *DO (x [**predicate'** (x)]) − Mary sewed for hours −*,

     or *DO (x [**predicate'** (x, y)]) − Mary played the violin*,

     or **predicate'** *(x) − Mary snored −*,

d) accomplishment: *DO (x [**predicate'** (x)]) CAUSE [BECOME **predicate'** (y)] − Mary*

     made the dress.

These types incorporate different roles depending on the lexical entry of the verb. RRG assumes that functional *Case Roles*, but not specific semantic descriptions, are specified in LS. With regard to prepositional assignment to functional roles, predicates expressing location are assumed to have the two place abstract predicate *be-at (x,y)* in LS, where *x=located theme*, and *y=location*. The addition of the abstract predicate BECOME produces the change of location. Thus, *to= BECOME be-at (x,y)*, and *from=BECOME NOT be-at (x,y)*. Thus, *from* marks locative-source as *to* marks locative-goal with verbs of motion. We can specify prepositional marking by positing lexical rules which stipulate the occurrence of a particular preposition with a specified LS.

Prepositions are classified by their decomposed LSs. The traditional distinction between grammatical (non predicative) and adverbial (predicative) prepositions is defined as a clause layer phenomenon, the *CORE* arguments of a verb LS corresponding to the grammatical cases, and the peripheral arguments to the adverbial or predicative functions. Jolly tries to offer a unified account of both types of functions in terms of LS. With that purpose, she distinguishes three main types of prepositional functions (1991: 104 ff.):

a)- Non-predicative prepositions: They mark verbal arguments in LS. Three subclasses are distinguished:

1.- Prepositions which are both syntactically and semantically necessary, e.g. *to* in *John gave the book to Mary*,

2.- Prepositions which are semantically necessary, but may be syntactically unrealised, e.g. *serve with/to* in sentences such as *John served the guests/ John served the wine* (the semantic and syntactic valences of the verb differ).

3.- Prepositions which are syntactically and semantically optional, but which mark arguments of the verb when they are realised, e. g. *break against*, where *against* specifies a locative argument not realised in *John broke the vase*.

b) Class two prepositions: They share an argument with the verb, and provide a new

argument, e.g. *John baked a cake for Mary*.

c) Adjunct or predicative prepositions take the entire LS of the verb as one of their arguments, as in *John prayed before noon*.

Jolly provides a set of two semantic primitives for the LS of prepositions *be-at*, and *be-via*, as logical constants. With these and some abstract predicates, like CAUSE, BECOME, and DO, she tries to find LSs compatible with clause types – stative, activity achievement, and accomplishment.

Jolly's approach belongs to a propositional semantics trend that tries to link Semantics and Syntax, as understood in the structuralist-generative tradition. The semantics of sentences is based on their truth values. Full meaning is assigned to prepositions in virtue of the compositionality of propositional meaning. The flaw in Jolly's LS for prepositions is that *be-at* and *be-via* are assumed to be core predicates for other prepositions than *at* or *via*. This assumption presupposes that other prepositions subsume these two in their meanings. But *be at* is in semantic contrast with *be on,* as well as with *be in.* So, *in* or *on* do not subsume *at* as a meaning. The same can be said of *via,* with respect to *on* and *in*.

2.3.8 Cognitive Grammar

DeLancey (1991) pointed out that the central problem for linguistic semantics is to describe the relation between the wide and subtle variation found in the world of experience and the smaller set of categories available in a language. In *Cognitive Grammar* (Langacker, 1987, 1991 *a*, 1991 *b*, 1993 *a* 1993 *b*), syntax is dealt with under mere semantic consideration. The concept of syntactic category becomes a matter of profiling, as well as of very basic schemes of conceptualisation. Thus, the scheme instantiated by prepositional predicates requires that a relation is conceptually established between two elements (*Trajector* and *Landmark*). Both verbs and prepositions instantiate relational predicates which profile the interconnections among conceived entities. The conceptualisation that provides the profile of prepositions is what Langacker calls *atemporal relations*, which contrast with *temporal relations* or processes (expressed by

verbs). This distinction involves the contrast between *summary scanning* and *sequential scanning*:

> Sequential scanning is the mode of processing we employ when watching a motion picture or observing a ball as it flies through the air. The successive states of the conceived event are activated serially and more or less instantaneously, so that the activation of one state begins to decline as that of its successor is initiated; essentially, we follow along from one state to the next as the event unfolds.[10] On the other hand, summary scanning is what we employ in mentally reconstructing the trajectory a ball has followed (e.g. in identifying a pitch as a curve, fastball, or slider and diagramming its degree of curvature). The component states are activated successively but cumulatively (i.e. once activated they remain active throughout, so that eventually they are all coactivated as a simultaneously accessible whole. The difference between a complex atemporal relation (like *across*) and the corresponding verb (*cross*) is therefore attributed not to their intrinsic content, but rather to the mode of scanning employed in their activation – a matter of conventional imagery.(Langacker, 1991: 22-23)

Thus, the category of prepositions is not a set of units listed in the lexicon. Rather, it is a kind of conceptualisation of relations between entities, which can be instantiated by certain lexical units according to conventional imagery. The same lexical unit can occur in linguistic expressions as an instance of different grammatical classes, if conventionalisation allows for it.

Thus, syntactic constructions are not produced by virtue of innate rules, but by virtue of the procedural meaning construction carried out by speakers, according to very basic principles of integration (e.g. Gestalt configuration and unification). A construction is not deemed either grammatical or nongrammatical. Rather, speakers judge it in terms of conventional or nonconventional, conventionality being a matter of degree.

2.3.9   Summary

The semantic content of prepositions has been considered according to two main trends:

1.- As full lexical elements, heads of PPs, presenting similar syntactic patterns to other lexical categories – Chomsky (1965), Jackendoff (1983), Bierwisch (1988).

2.- As case markers (a closed class) without full meaning (Fillmore, 1968 *a*, 1968 *b*, 1977).

Bresnan (1982) tries to reconcile both tendencies by postulating two categories (predicative vs. nonpredicative prepositions), which are semantically related. Gawron (1986) and Jolly (1991) try to unify predicative and nonpredicative uses under a single category by establishing a fixed LS for each preposition. However, a unified LS does not explain the various usages and the semantic contrasts between prepositions. Langacker (1987, 1991 *a*, 1991 *b*) postulates that semantics is previous to syntactic construction. A single unit may occur in diverse syntactic constructions according to construal. To be accepted by the addressee, the use of a particular unit in a given syntactic construction must be conventional enough in the linguistic community.

2.4   Case endings, prepositions, subordinators, adverbs, verbs: a continuum

We find a group of units which behave as an adverb, preposition or subordinator. Other items behave either as preposition or adverb, but never as subordinator. Still others appear as prepositions or subordinators, but never as adverbs. Some units occur as prepositions, and never as adverbs or subordinators. Finally, other units can be prepositions, adverbs and even verbs, adjectives, or nouns. In any case, the possible distributions of an item are determined by conventionalisation in the linguistic community.

I suggest that the whole set under discussion constitutes a continuum that links lexicon and grammar. This goes against the Aristotelian idea that the world can be known by dividing it into clearly distinct categories in virtue of class properties. Within linguistic analysis, it has been traditionally assumed that linguistic categories follow such classical patterns. However, recent experiments in Psychology show that concepts cannot be classified into discrete sets in the human mind (Rosch, 1973, 1978, 1981; Mervis & Rosch, 1981). The idea of the linguistic continuum is partly inspired on these results. Though it had already been suggested

that prepositions form a continuum (Jacobson, 1977), this idea has been proposed in a more definite manner in CG (Langacker, 1987, 1991 *a*, 1991 *b*). Langacker argues that there are no inventories of linguistic units which belong to discrete categories. On the contrary, language is a single inventory of semantic and phonological units that merge into symbolic units. This whole set makes up a continuum which goes from units with a strong lexical character to schematic units with a general configuration, like the assemblage between actor and action. A symbolic unit cannot be classified as belonging to a syntactic class or conceived of as possessing a particular categorial character, but can be used in diverse ways according to meaning construction in every speech act. Only those usages are accepted which are sanctioned by conventionalisation in the linguistic community. In any case, usage is not barred by a fixed mental grammar, but by convention, this factor being situational as well as a matter of degree:

> ... lexicon, morphology and syntax form a continuum of meaningful structures whose segregations into discrete components is necessarily artifactual. [...] The symbolic units of a language are heterogeneous, and differ even qualitatively owing to their position along certain parameters, notably specificity and **symbolic complexity** (analysability into smaller symbolic elements). However, their distribution along these parameters is essentially continuous and does not offer any principled basis for dividing them into discrete components. (Langacker, 1991 *a*: 3).

> The lexico-grammatical resources of a language include a vast inventory of fixed expressions, both simple and symbolically complex, together with a host of schemas describing classes and constructions. An expression's grammatical class is determined by the nature of its profile. (Langacker, 1991 *a*: 5).

Lexicon and grammar form a continuum of symbolic units, so that syntax and semantics are not independent from each other. Different syntactic constructions are determined by construal. So, in *Bill sent a walrus to Joyce* the preposition preserves its semantic value, since we find another way of construing the same situation, namely, *Bill sent Joyce a walrus,* where directionality is not emphasised. The lexico-grammatical inventory, includes all those units that have been structured and sanctioned by speakers' conventionalised usage. Speakers activate these units as cognitive routines, not constrained by syntactic rules. Therefore a single unit like *in*, can appear in different constructions according to the speaker's

conceptualisation of the event. The difference between *Jane got in the car* and *Jane got in* is not borne by two different semantic contents of *in*, but by the explicitness or implicitness of the following NP, this factor depending on pragmatic function (Grice's maxim of quantity). The existence of various categories for *in* and other similar units is not postulated in *Cognitive Grammar*. The diversity of syntactic constructions where these units occur is not explained by membership of separate categories. They are single lexical units with no categorial assignment, which are instantiated in different syntactic constructions. Syntactic constructions are schematic symbolic units which activate meaning themselves, in the same way as lexical units do. The choice among syntactic constructions, as well as lexical insertion, is not determined by innate rules, or subcategorisation rules, but is rather determined by construal, a process that speakers carry out at every speech act through activation of conventionalised units. Hajicova (1991) argues in favour of this idea when she claims that word order is freer than stated by constituency and categorial accounts.

In the following, I try to illustrate a segment of the English linguistic spectrum of symbolic units, and the arrangement of some units along the continuum. I adopt the prepositional construction as a point of reference, so that the segment analysed will be that of the units which appear in this construction.

2.4.1   The schematic end of the continuum: the genitive

Starting at the most schematic end, we find a formal case marker, namely the genitive ending *'s*. This unit shares its morphological character with other grammatical endings, such as the plural ending, which is also found in nouns. Thus, nominal inflection allows for four forms: *boy, boy's, boys,* and *boys'* (the contrast between nominative and genitive plural is not phonologically expressed). On these grounds, the genitive ending is categorised as a grammatical ending. Nevertheless, it differs from other English endings in its ability to occur detached from the noun it affects, as in *The teacher of music's room* (Quirk et alii, 1985: 328), or in *That shop you recommended to me's prices* (Downing and Locke, 1992: 438). However, this type of occurrence is less frequent than the normal construction, with the ending attached to the noun stem. On the other hand, the genitive resembles the preposition *of* semantically. Taking this resemblance into account, so as to produce a semantic

classification, the genitive could then be deemed to be a lexical unit, and would abandon its morphological character. The distribution of both genitive ending and preposition *of* is a matter of degree, and depends mainly on the semantic structure of the noun they affect. The genitive is frequent with nouns that denote persons, animals, and collective nouns, and less frequent with geographical names (*Europe's future*), locative nouns (*the world's economy*), temporal nouns (*a day's work*), and other nouns of special relevance to human activity (*the mind's development*). With inanimate nouns the *of*-construction is normally required (*the roof of this house*). Besides lexical semantics, other factors, such as relational factors, objective and subjective relation, syntax, or communicative factors may influence the choice of one or the other type of construction[23].

2.4.2 Of

The unit *of* is the most frequent of the group of units which occur in prepositional constructions[24]. Its peculiarity lies in the fact that, in an overwhelming proportion, its PP is a postmodifier of an NP. Unlike other prepositions, its PP only modifies verbs in very specific contexts where the verbal stem requires a prepositional object, as in *think of, admit of, become of, come of, conceive of, dispose of,* and a few other verbs[25]. The same thing happens with a very reduced group of adjectives like *fond of*. The PP of *of* very seldom acts as an adverbial (e. g. *to die of hunger*). *Of* functions as a traslative, since it transfers NPs into the category of adjectives, or even adverbs into prepositions, when postponed (*out of, instead of, in spite of*, etc.). It requires the two terms of the relation A and B. As de la Cruz points out (1975: 74) this preposition lacks the spatial meaning which characterises other prepositions. For this reason it has not developed any temporal or abstract senses. It does not introduce verb complements of spatial character, as other prepositions do. It could, therefore, be excluded from the category of prepositions on this criterion. If the fact that it modifies a noun in the majority of its appearances is emphasised, one could identify it as a nominal morpheme, similar to the genitive of other tongues[26]. In other respects, however, it

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[23] For details on this issue, see Quirk et alii (1985: cf. 5.115, cf.17.38 ff).

[24] In the Brown Corpus (Francis & Kucera: 1961) 36,407 occurrences of this unit appear. The next most frequent preposition is *to* which produces 26,143 occurrences, followed by *in* (21,341), *for* (9,485), *with* (7,286), *on* (6,735) *at* (5,377), and *by* (5,303), other prepositions being much less frequent.

[25] This pattern does not seem to be productive with *of* in present day English.

[26] In fact, this is the position adopted by Chomsky (1981: 94, 323, fn. 6).

harmonises with the bulk of prepositions, because it introduces a postmodifier NP, it is a free morpheme, it occurs with certain, albeit very few, prepositional verbs, and it introduces some types of adverbials (cause adverbials). It does not occur as an adverb, or conjunction, or particle of phrasal verbs (*he came of, *he saw of they came, *put it of*).

2.4.3 To

The unit *to* is the only preposition that may precede an infinitive. This already occurs in OE (de la Cruz, 1972: 82), e.g. *utane forð to brenganne mid weorcun* (Cura Past. 417.17). If we understand this context as syntactically different from the usual one of PPs, we should have to postulate a new category to_2 which co-occurs with the infinitive, different from the preposition to_1, with its adverbial sense of movement towards a limit (e.g. *He wants to be notified* (Webster's: 1607) versus *He came to the house* (Webster's: 1489)). One should also have to postulate a different to_3 for those cases where the expression indicates purpose (e.g. *I left early to catch the train* (Webster's: 1107)), and even a dative category to_4, given that this unit precedes the I.O. (e.g. *Give it to me* (Webster's: 1489)). A comparison of the units *of* and *to* reveals that they share the function of case marker. On the other hand, only *to* has, in addition, a spatial semantic value, and even a further value as a verbal morpheme. In this respect it differs from other prepositions, and its categorisation as preposition might be questioned by virtue of this fact. *To* may be used as an adverb, like most prepositions, but this usage turns out to be rare: *Pull the door to* (Webster's: 1489). It is neither used as particle of phrasal verbs (*Put it to*), nor as conjunction (*He came to we were eating*).

2.4.4 The At-group

The units *at, from, with, onto*, or *into*, are always the head of a PP (Sroka's P-words except *for*), and the functions of these phrases are those established in the Grammar (Quirk et alii, 1985: 657): noun modifier (e. g. *The people at the door were singing*), verb modifier (e. g. *The people were singing at the door*), and prepositional complement of verbs (e. g. *We were looking at his awful paintings*) and adjectives (e. g. *happy at her suggestion*). These units alone could be considered the genuine prepositions, since they always require a complement, they never act as adverbs, conjunctions, or affixes[27]. As Xavier Campos points out (personal communication), prefixation with *at* occurred in OE, as in *ætbredan* (withdraw), *æteowian* (display), *ætfecgan* (seize), *æthabban* (retain), *ætferian* (carry out, take away), etc., but this type of prefix decayed, and many of those that did not occur as independent adverbs have been lost as prefixes (Roberts, 1936; de la Cruz, 1972, 1975).

2.4.5 The For- vs. but-group

This group shares the function of introducing clauses with the rest of subordinators, as is the case with *for* and *till* (e.g. *a closet for dishes* (Webster's: 553) versus *I was sleeping, for I was tired* (Webster's: 132)). Sweet (1900: 134) calls them *Preposition-Conjunction* words. The elements belonging to this group do not appear as adverbs (**he came for*), nor as particles of phrasal verbs (**I put it for*)[28]. In the case of *for*, we also find the function of case marker for dative expressions. De la Cruz (1975: 52-53) considers it within the group of pure prefixes in OE verbs that govern dative objects.

Some prepositions, such as *but, than, as, except, besides*[29], are mainly classified as conjunctions, as in *As you are leaving last, please turn out the lights* (Webster's: 201). Their function consists of introducing a subordinate clause in most of their appearances. Therefore, they are only marginally considered to be prepositions, as in *No one replied but me* (Webster's: 201); *to act as a chairman* (Webster's: 86). Like the units in the *for*-group, these

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[27] However, an example of *at* as a prefix has been found in the corpus used for this dissertation, in the American word *at-bat* (turn at the bat in the game of baseball).
[28] For a thorough study of prepositional *for* see Jolly (1991: 124-132).
[29] Jacobson (1977) offers an interesting illustration of this group of particles, with regard to various functions

elements cannot appear as adverbs (*I came as*), nor as particles of phrasal verbs (*I put it as*).

The classification of these two subgroups as prepositions or conjunctions in conventional grammars and dictionaries is a matter of absolute frequencies. There is a gradience between both categories, some elements being more clearly classifiable than others into one of the subgroups. Thus, the unit *but* is more easily thought of as a conjunction, and the unit *for* is more easily thought of as a preposition, or even this judgement could possibly vary if we ask different native speakers.

2.4.6 The Across-group

Apart from the main prepositional functions described for the *at*-group, the units in this group can also be intransitive, and therefore, considered to perform adverbial functions (e. g. *As far as the house and beyond* (Webster's: 144)). They can also occur as adverbial particles in phrasal verbs (e. g. *He ran along beside me* (Webster's: 42)). In this group units such as *about, across, along, around, beyond, behind, besides, inside*, and *past* are included. These units do not appear as subordinators (**He arrived beyond we were*).

A subgroup of them, the *on*-group (*on, by, off, over, under*) may appear as prefixes in the formation of new words – a procedure which is active in the English language nowadays (*on-line, by-pass, off-hour, overrun, etc.*). According to de la Cruz (1972: 83) English already shows a definite structure Prefix-Preposition-Adverb in the old period, and many units developed the three functions in OE. Preverbs are joined to the verbs in front position, and these are not adverbs because they do not admit separation from the stem. The adverbial position is characterised as the new development in OE:

> If the typology of the old Indo-European languages shows a tendency towards the preverbial consolidation, the characteristic of the Germanic languages is a tendency towards the weakening of that consolidation which is largely replaced by the increasing use of phrasal verbs. (de la Cruz, 1972: 84).

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as subordinators and prepositions.

If prototypical members of a category are those that show most of its features, this group would be prototypical for the class of prepositions. This has a simple consequence, namely, that *at, with, onto, from*, and *into,* which only appear in prepositional function, would not belong to the prototype group.

By has, in addition, the function of introducing the agentive noun in passive clauses, thereby being comparable to *of, to,* and *for* with regard to their *bound-morphemic* character and *case-marking* behaviour.

2.4.7   After and before

These units can appear as subordinators or prepositions. Curiously, only *after* occurs in the formation of prepositional verbs (*look after, take after*, etc.) but none of them is used as the adverbial particle in phrasal verbs. Both can be adverbs, but *after* is less frequent as such, because of the existence of the form *afterwards* which also covers this function. Thus, we find examples like:

> *The king entered with macebearers walking before* (Webster's: 134) (adverb);
> *I will die before I submit* (Webster's: 134) (subordinator);
> *A lawn before a house* (Webster's: 134) (preposition);
> *to look after a child* (Webster's: 845) (prepositional particle).

However, examples like the following do not occur: **Look before the children* (prepositional verb); **He put it after* (phrasal verb).

Already in Anglo-Saxon was *æfter* most commonly a preposition and not an adverb, as in Þa eode ðæt wif æfter him *(Boethius 103, 11)* (De la Cruz, 1972: 93). De la Cruz points out that this form is derived from a prefix in Goth, namely *af,* and appears as a prefix in OE, as in *we him ne cunnon æfterspyrigean* (De la Cruz, 1972: 93). *After* has therefore some occurrences as a prefix in present English (*afternoon, afterwards, aftermost, afterbirth, aftercare*, etc.) but *before* does not occur in this position, except for *beforehand*.

2.4.8   Adverbs

A reduced group of adverbs can also occur with prepositional function (*up, down, out, in*). They already show a tendency to become a preverb in OE (*uppe, ute, inne* as *uf, us*, *in*) but they decay as preverbs and become adverbs already in OE. *Down* derives from an adverb and not a preverb, since its origin is a noun of spatial character, namely *dalaÞ* (valley) (de la Cruz, 1972: 94). This would be the reason why it has not yet a full distribution as preposition. Interestingly enough, the absent function in this case is that of subordinator, as will be noted from the following examples:

> *They ran off down the street* (Webster's: 430) (preposition)
> *He fell down* (Webster's: 430) (adverb)
> *Don't let me down* (McArthur & Atkins: 133) (adverbial particle)
> **They came down we were* (subordinator)

Nevertheless, some contexts do not admit the prepositional function, as in the following expressions:

> **the lamp down the table*
> ** the lamp up the table*

For these contexts – mainly *NP + P + NP,* other prepositions take over the function, as we see in these expressions:

> *the lamp under/below the table*,
> *the lamp on/above the table*.

Up, down, out and *in* also merge with other grammatical categories that are not associated with prepositions at all. We find them as stems incorporating a suffix in adjectives (*inner, outer, upmost, outmost*), nouns (*upper, downer, innage, outage*), and adverbs (*inly, upwards, outwards, outby*). Furthermore, they can appear as nouns, adjectives, or verbs (*to out*), as in the following examples:

He had a great many ups and downs in his time. (Webster's: 1569)

This period of prosperity is an up for the entire country. (Webster's: 1569)

Persons who were ups in the business world suffered losses in the economic depression. (Webster's: 1569)

He joined a fraternity because he was afraid of becoming an out. (Webster's: 1021)

The election made him an in. (Webster's: 718)

the in part of the mechanism (Webster's: 718)

the in place to dine (Webster's: 718)

The truth will out (Webster's: 1021)

Then he upped and ran away from home (Webster's: 1570)

Other adverbs cannot occur as prepositions at all, like *away, back, forward* and *forth*. These are formations on nominal stems that become adverbs (*away, back, forward*) and have no preverbial character in OE (de la Cruz 1972: 94-95), or are adverbial forms without prepositional function, already in OE, like *forth*[30].

2.4.9   Conclusions on the categorisation of prepositions

I have shown that the units that have usually been called prepositions do not present a homogeneous behaviour as such prepositions. Homogeneous word classes do not seem to really occur (Taylor, 1989, 1994). On the other hand, one single unit does not necessarily belong only to a particular syntactic category. These facts are illustrated in table 2.1. below. As T. Givón remarks, natural classes are seldom as neat as logical classes:

> ...First, not all members of a natural class abide by rigid membership criteria to the same degree. Second, membership is most commonly determined by a **cluster of criteria**. Some of these criteria are more important ('central') than others, but none is absolutely inviolable by *itself*. Consequently, natural classes do not resemble logical

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[30] See Campos-Vilanova (1994) for a thorough illustration of this fact.

classes; their definitions, and thus their boundaries, are a bit fuzzy, they allow some slop, ambiguity and overlap. (Givón, 1993: 52)

It can be observed that the 'central' criterion for the category under analysis is the use in the prepositional construction, since it is the most common feature. On the other hand, Givón notices that "the population of a natural class is often best characterised by its frequency distribution curve, where – with respect to any criterial feature or cluster of features – the most prototypical members are closest to the **population mean**" (Givón, 1993: 53). In the set under analysis, the *fairly typical* group, the majority of members of the category is found in the *across*-group. A minority of members are less typical or deviant, and they overlap with other categories at both ends of the periphery (*up*, *down*, *of*, *'s*).

Nevertheless, if other criteria are adopted as central, for instance the feature of having subordinating function, a different set of units would result, and some of the items analysed here as prepositions would be *deviant* subordinators. Likewise, if we analysed adverbs, some of our prepositions, would be *deviant* adverbs; and so on.

Syntactic approaches deal with semantics as a subsidiary component to syntax (Chomsky, 1965, 1981; Fillmore, 1968 *a*, 1968 *b*, 1977; Bresnan, 1982; Jackendoff, 1983), whereby semantic features of a lexical entry play the function of selectional restrictions in syntax. For this reason, semantic markers are reduced to a minimum set of primitive semantic features (Katz & Fodor, 1963). The search for economy in the lexicon leads to the postulation of a core sense for each preposition. Variations in meaning belong to the context, not to the unit itself. However, the contexts considered by these approaches are considerably limited, since verb particles (in phrasal verbs and prepositional verbs), as well as grammatical markers (*of, to, for, by*) are listed in the lexicon under the entries of verbs they cooccur with, and this does not require any semantic analysis. The core sense is posited under the assumption that it is common to all the occurrences of a unit, and is defined in terms of binary *semantic markers*. Analyses from this perspective, such as Bennett's (1975), diminish the semantic scope of units like *at* to a simple LOCATIVE, assuming that this is the only meaning of that unit in all its occurrences. Brugman (1981), Lakoff (1987), and Dewell (1994) showed that the alleged core sense does not appear at every occurrence of the word *over*. New senses are derived from others that share some feature with them, but no feature appears in all senses. The ends

of the chain turn out to share no feature at all. A central or prototypical sense is posited that bears the largest number of features belonging to that category, in contrast to peripheral senses that are the result of derivations performed by means of meaning extension. The semantic structure of *over* could explain the sense of the prefix in *overlook*, the sense of the particle in *look over*, as well as the sense of the adverb in *They marched over*. Lindner (1983) showed how a semantic chain could also explain particle meaning in phrasal verbs and prepositional verbs. She set aside the false idea that those particles are void elements of lexical entries for verbs listed in the lexicon.

If semantic structure is explained by means of family resemblances, semantic chains, and prototypical senses that give birth to further more peripheral senses, then semantic diversity in the usage of lexical units can be accounted for. In the following chapters I will carry out a semantic analysis according to such premises, which will be coherent with the continuum hypothesis illustrated in this chapter.

Table 2.1. Lexico-grammatical distribution of English preposition particles in the lexicon-grammar continuum:

	Nominal morpheme	Verbal morpheme	Preposition	Preposition particle*	Subordinator	Prefix	Adverb particle*	Adverb	Stem
's	x								
of	x		x	(x)					
to	x	x	x	x				(x)	
at,...			**x**	**x**		**(x)**			
by	x		x			x	x	x	
for	x		x	x	x				
till,...			x		x				
after			x	x	x	x		x	
but,...			x		x				
before			x		x			x	
across			x	x			x	x	
on			**x**	**x**		**x**	**x**	**x**	
in, **out**[31]			**x**	**x**		**x**	**x**	**x**	**x**
up, down			(x)			x	x	x	x
away							x	x	

*In Prepositional verbs and phrasal verbs

[31] Only in American English. In British English, where the complex preposition *out of* covers the prepositional usages, *out* belongs to the *up*-group.

3. THE COGNITIVE SEMANTICS APPROACH TO SEMANTIC STRUCTURE

3.0 Introduction

In this chapter I introduce some notions of semantic theory that will be used, or assumed, in the analysis of *at*, *on*, and *in*. The semantic theory adopted is *Cognitive Semantics* as proposed by Langacker (1987, 1991 *a*, 1991 *b*) and Lakoff (1987, 1988). This theory assumes the following notions: experientialism; categorisation based on prototypes and family resemblances; image-schemas, and their extension; universals of construal; Idealised Cognitive Models (ICMs); frames; metaphor and metonymy as mechanisms for meaning extension; mental spaces; and, finally, polysemy models for prepositions.

3.1 Experiential semantics

According to Cognitive Semantics conceptual systems grow out of bodily experience, and are grounded in perception, body movement, and experience of a physical and social character (Johnson, 1987). But thought can also be imaginative, since those concepts that are not directly grounded in experience employ metaphor, metonymy and mental imagery (Lakoff & Johnson, 1980). Experiential semantics views the elements of thought as having gestalt properties and not as atomistic abstract symbols arranged in the form of propositions by means of mechanical operations.

Lakoff's proposal is that of *experiential realism*, which goes along with connectionism (Damasio, 1994) as well as biologism and social realism (Searle, 1992, 1995). It assumes a commitment to the existence of the real world, it acknowledges that reality places constraints on concepts, it conceives of truth as going beyond mere internal coherence, and it accepts a commitment to the existence of stable knowledge of the world (Lakoff, 1987: 260ff). The body has the ability to reason which is shaped by genetic inheritance, environment, and social as well as physical functioning. Reason can be abstract and creative as well as about concrete

things, but it is not transcendental; it goes beyond what any machine can do, because it is human in a biological sense. Conceptual embodiment implies that properties of certain categories are a consequence of the nature of human biological capacities, and of the experience of functioning in a physical and social environment. Functional embodiment implies that certain concepts are used automatically, unconsciously, as part of normal functioning. These have more important psychological status (Lakoff, 1987; Lakoff & Johnson, 1997).

On the other hand, bodily experience is internalised according to certain experiential parameters such as space, force dynamics, sensation and basic-level concepts (McLaury, 1991: 65).

These ideas will be taken into account for semantic analysis, since the physical experience of children, both with objects and with their own body, is crucial in the process of acquisition of spatial concepts.

3.2   *Categorisation*

3.2.1   *Classical vs. natural categories*

Categorisation is basic to our thought, perception, action and speech. Most of it is automatic and unconscious, and it is fundamental to higher cognitive activity. Nominalism claimed that sameness is merely a matter of linguistic convention. On the other hand, realism sees categories as existing independently of language and its users, and words would name pre-existing categories.   Classical theories of categorisation tell us that a category consists of properties shared by objects in a container, and that categories exist in the world independent of human beings. The main tenets of classical categorisation derive from this approach:

a) There is a fixed set of necessary and sufficient conditions defining membership of each category.

b) Features are binary (there is or there is not), and all necessary and sufficient features defining a category have equal status.

c) Categories have clear, fixed boundaries (members vs. non-members)

d) All members of a category have equal status (full members); and all non-members of a category have equal status. There are no degrees of membership.

The feature approach was introduced in linguistic semantics by Katz & Fodor (1963) in their account of semantic structure, where a meaning is clear-cut and defined by *semantic markers* and *distinguishers*. According to this approach, features make it possible to define lexical entries, among other things like throwing light on certain kinds of sentence meaning, and on the meaning relationships that exist among sentences. The truth of a synthetic sentence depends on the real state of affairs, whereas the truth of an analytic sentence depends on the meanings of its terms. A contradictory sentence is necessarily false because of feature incompatibility. Features account for semantic relationships of entailment, mutual entailment (synonymy) and contradiction. Finally, knowledge of these features is claimed to be innate and independent from world knowledge. Taylor points out the contrast of this view with that of cognitive semantics, and suggests the existence of a connection or interaction between natural and linguistic categorisation:

> ...whereas generativists regard knowledge of language as an autonomous component of the mind, independent in principle from other kinds of knowledge and from other cognitive skills; cognitivists posit an intimate, dialectic relationship between the structure and function of language, on the one hand, and non-linguistic skills and knowledge on the other. Language being at once both the creation of human cognition and an instrument in its service, is thus more likely than not to reflect, in its structure and functioning, more general cognitive abilities. One of the most important of these cognitive abilities is precisely the ability to categorise, i.e. to see similarity in diversity. (Taylor, 1989: VIII)

The question arises whether semantics should deal with physically and perceptually distinct properties of the real world, states of affairs, relationships between entities, etc. as *Situation Semantics* or *Role and Reference Grammar* try to do, or whether it should consist of the

study of mind and mental processes whereby human beings conceptualise their world, as *Cognitive Grammar* pretends.

Now, do semantic categories such as the ones that will be analysed in later chapters have any basis in the real world or are they merely constructs of the human mind? Other puzzling questions relate to the internal structure of those categories, how they are learnt, how people use them, and the relationships between them. The reality-as-a-continuum hypothesis (Taylor, 1989: 6) states that "reality is merely a diffuse continuum and our categorisation of it is ultimately a matter of convention". Following this hypothesis, word meanings are not given by any properties of the world, and the lexicon of a language is not simply a set of labels for some universally valid inventory of concepts.

3.2.2   Prototype theory

Contrary to the *truth value / feature* approach, conceptualism maintains that concepts mediate between words and entities, and govern linguistic performance. The psychological theory that has modelled human experience of natural categories has been called the *prototype theory* of categorisation, which was introduced in linguistic semantics by Linda Coleman and Paul Kay (1981).

The main ideas of prototype theory are presented by E. Rosch in several articles (Rosch, 1973, 1978, 1981; Mervis & Rosch, 1981) that sum up her research during the seventies. In attribute domains, such as colour or shape, Rosch (1981) argues categories form around perceptually salient points in the domain, and such points form cognitive prototypes for the categories. For such categories, prototypes are probably psychologically determined and therefore such categories should be universal; only the category boundaries are expected to vary with culture. Object categories are also structured around prototypes, although for these content is assumed to vary with culture. It is argued that categories of objects become organised so as to maximise the correlation and predictability of attributes within categories. So, co-occurrence of attributes leads to a prototype. For object categories, prototypes are the objects which most strongly reflect the attribute structure of the category as a whole; thus, by means of prototypes, categories can be made to appear simpler, more clear-cut, and more

different from each other than they are in reality. Categories and prototypes can vary across cultures but the principles of category formation and of development of prototypes can be expected to be universal. As a conclusion, Rosch suggests that categories are not arbitrary but psychologically determined. The two basic principles for categorisation are *cognitive economy* and *perceived world structure*, i.e., on the one hand, a main purpose of categorisation is to reduce the infinite differences between stimuli to behaviourally and cognitively usable proportions, and on the other hand, abstraction of attributes for categorisation is performed among those attributes that the human species can perceive, or among those that are culturally given to a particular individual. Thus, there will be olfactive attributes perceived by dogs but not by humans, audible attributes perceived by bats but not by humans, etc. (Rosch, 1978). Other relevant notions that I will assume for my analysis are the following:

a) *Centrality*: In her research on focal colours, Rosch (1973) concludes that these are central for colour categories, since they were learnt faster, with fewer errors, and were better remembered than non-focal colours by her subjects. This shows that some members of a category may be better examples of that category than others. As a consequence, all members of a category are not equivalent perceptually, some being more representative than others. With respect to linguistic categories:

> ...natural language categories are not necessarily composed of combinations of simpler, already learned attributes; and in most, if not all, natural language concepts, some stimuli are clearly better exemplars of the concept than others. (Rosch, 1973: 329)

The author shows evidence that there are nonarbitrary colour and form categories which form around perceptually salient 'natural prototypes'.

b) *Salience*: Rosh's studies provide an opportunity to look at the relative *salience* (learnability) of different basic colour areas compared to each other. She shows that there is a consistent tendency for the four 'primary' focal colours to prove different from the four 'secondary' colours (Rosch, 1973: 340).

c) *Gradience*: There are degrees of membership and fuzzy boundaries of categories.

d) *Basic level categorisation*: The *basic level* of abstraction for categorisation is that for which the organism can obtain the most information with the least cognitive effort (general cognitive economy). Categories that are cognitively basic are in the middle of a general-to-specific hierarchy. Generalisation proceeds upward from the basic level and specialisation proceeds downward. The hierarchical organisation of categories thus has different levels. For instance:

furniture $\quad \rightarrow$ chair $\rightarrow$ kitchen chair $\rightarrow$ n

$\rightarrow$ dentist's chair $\rightarrow$ n

Factors that intervene are perceptual salience, diagnostic value, and context of comparison.

e) *Basic level primacy*: *Basic level* categories are functionally and epistemologically primary with respect to gestalt perception, image formation, motor movement, knowledge organisation, ease of cognitive processing (learning, recognition, memory) and ease of linguistic expression. Basic level categories are, therefore, defined by common attributes, motor movements, similarity in shapes, and identifiability of averaged shapes.

f) *Family resemblances*: Members of a category differ in the extent to which they share attributes. The category is not structured in terms of shared criterial features, but rather by "a criss-crossing network of similarities" (like a family). Items which have the highest *family resemblance* scores are those with the most shared attributes. The relevance of this notion for linguistic categories was first emphasised by Wittgenstein (1953). According to Mervis & Rosch (1981) the idea of *family resemblance* does not necessarily indicate that category members must have no attributes which are common to all members.

g) *Cue validity*: The validity of a given cue *x* as a predictor of a given category *y* increases as the frequency with which cue *x* is associated with category *y* increases. The *cue validity* of a category is the summation of the *cue validities* for that category of each of the attributes of that category. The *cue validity* of a cue is the ratio between the frequency with which it is

associated with a category, and the total frequency of the cue in the material. The notion of *cue validity,* as used by Rosch, implies that attributes are differentially weighted; some might be essential, others can be overridden with varying degrees of facility. Essential attributes have the highest *cue validity* for a certain category.

h) *Prototype*: Entities are categorised on the basis of their attributes. Categorising an entity, however, is not a question of ascertaining whether the entity possesses this attribute or not, but how closely the dimensions of the entity approximate to the optimum dimensions. Attributes are real world properties, gradable, functional, interactional, with a role in culture, (not semantic primitives). They are non-essential for distinguishing one category from the other. Prototypes serve as reference points for the categorisation of less clear instances. Entities are assigned membership in a category in virtue of their similarity to the prototype, the closer an entity to the prototype, the more central its status within the category.

3.2.3   Implications for linguistic categorisation

Rosch's studies on natural prototypes could have several implications as she pointed out herself:

a) There may be other domains which are organised into natural categories.
b) Even in non-perceptual domains, artificial prototypes (the best examples of non perceptual categories) once developed, may affect the learning and processing of categories in that domain in a manner similar to the effects of natural prototypes.
c) Decomposability of categories into elements is discussed: "the tendency in cognitive models is to decompose almost automatically, but there is also evidence of holistic processing of some stimuli or at some stages". (Rosch, 1973: 349)

Langacker has stressed the last aspect: Cognitive structures are often understood as holistic, gestalt configurations, rather than as attribute bundles. The parts are understood in terms of the whole, rather than viceversa, and attributes are dimensions along which different entities are regarded as similar, as integrated units (Langacker, 1987: 19ff). With regard to spatial

predicates I suggest that the first meanings of these words learnt by children have this kind of gestalt configuration.

Category boundaries are fuzzy, and this is also observed for linguistic categories in the use of *hedges*. Lakoff defines *hedges* as "resources of a language which enable a speaker to express degree of category membership, e.g. 'loosely speaking', 'strictly speaking', 'in that', 'so called'" (Lakoff, 1972: 76). *Hedges* require us to distinguish between central and peripheral members of a category, as well as different degrees of non membership, as it can be appreciated in the following examples:

> *A robin is a bird <u>par excellence</u>.*
> *A turkey is a bird <u>par excellence</u>* (loosely speaking).*
> <u>*Strictly speaking*</u> *a bat is not a bird.*
> *An octopus is not a fish <u>as such</u>.*

Hedges make apparent that the tenets of the classical theory of categorisation are not valid for linguistic semantic categories.

3.3   Image schemas and conceptual schemas

3.3.1   Preconceptual image schemas

According to Gibbs & Colston (1995: 347) *image schemas* are experiential gestalts, i.e. different patterns of recurrent bodily experiences that "emerge throughout sensorimotor activity as we manipulate objects, orient ourselves spatially and temporally, and direct our perceptual focus for various purposes".

Johnson (1987), as well as Lakoff (1987), built the foundations for this conception of semantics whereby the most significant level of human interaction, namely the physical domain, is considered to be the basic level. According to their view, our experience is

preconceptually structured at a level where gestalts for general overall shapes are relatively rich in structure. They argue experience is structured in a significant way prior to, and independent of, any concepts in the form of these gestalts. As far as any internal structure can be identified in them, the wholes of these gestalts are psychologically more basic than their parts. Both Johnson and Lakoff describe some of these gestalts under the name of *image schemas*, and suggest several content domains which they can be transferred to. Thus, for Lakoff, the CONTAINER schema that defines the predicates IN and OUT would work as the basis for understanding the body as container, the visual field, and set models, among others. The PART-WHOLE schema is transferred to domains such as families, teams, organisations, marriage, etc. The LINK schema helps conceptualise social and interpersonal relationships. The CENTRE-PERIPHERY schema gives us the difference between important things or matters, understood as central, and less important or secondary matters considered to be peripheral. Finally, the SOURCE-PATH schema gives the clue for purposes in our daily life as destinations of a journey. Other *image schemas* are: PROXIMITY-DISTANCE which determines close and distant relationships; FRONT-BACK orientation; LINEAR order; UP-DOWN; MASS VS MULTIPLEX, etc. According to Lakoff, these *image schemas* might be so deeply grounded in common human experience that they constitute universal prelinguistic cognitive structures. Many of the schemas clearly derive from the most immediate of all our experiences, our experience of the human body. These *image schemas* lead to primary conceptualisations in the domain of physical experience and will define the primigenial use of words. The internal structure of word meaning is not autonomous, but exists against a background of our general assumptions about the world (sociocultural beliefs included), and word meaning is frequently prototype-based rather than being composed of checklists of features (Coleman & Kay, 1981). The prototypical use of a word will generally fit some normal, frequently encountered case, while deviation from that case is caused by fuzzy boundaries of the category. This view of meaning reacts against the classical idea that the lexical meaning of a word is a bundle of formal semantic features (Katz & Fodor, 1963).

Johnson (1987) explained the mechanism of transfer from some domains into more abstract domains. According to this author, there are metaphors that map image schemas into abstract domains, preserving their basic logic. The metaphors used are not arbitrary but motivated by structures inherent in everyday bodily experience.

3.3.2   Conceptual schemas

Langacker (1987: 371) calls attention to the fact that the extension from a prototype coexists with a second structuring principle, namely the elaboration of a schema. But Langacker − unlike Johnson and Lakoff − conceives of a schema as the primigenial configuration of a concept, albeit by means of combining *image schemas,* in Johnson and Lakoff's sense. In Langacker's terms schema is:

> ...an abstract characterisation that is fully compatible with all the members of the category it defines (so membership is not a matter of degree); it is an integrated structure that embodies the commonality of its members, which are conceptions of greater specificity and detail that elaborate the schema in contrasting ways. (Langacker, 1987: 371).

Langacker's schemas are common to all the members of a category. Schemas may be hierarchically organised within a category, in conjunction with extension from prototypes. As the author illustrates (Langacker, 1987: 373):
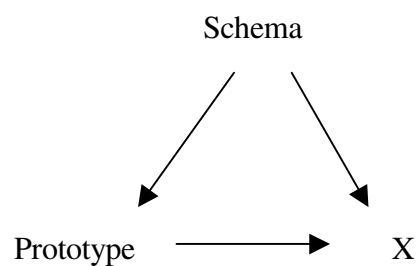
The schema gives origin both to the prototype and to further extensions of meaning (X), notwithstanding extensions from the prototype itself. Taylor disagrees with this view, since "for many categories of natural language, it is just not possible to abstract a schema which is compatible with all the members of the category". He argues that "...for many categories, membership clearly is a matter of degree. [...] categorisation by prototype occurs developmentally prior to categorization by schema." (Taylor, 1989: 67).

3.3.3 Extensions

Extensions take place by means of cognitive processes such as *image schema* transformations and metaphor as well as metonymy. Gibbs and Colston (1995: 350-351) review some of the possible transformations that can be applied to Johnson and Lakoff's *image schemas* as well as to Langacker's schemas. Some of these transformations are the following:

a) *Path-focus to end-point-focus*: Follow, in imagination, the path of a moving object, and then focus on the point where it comes to rest, or where it will come to rest.

b) *Multiplex to mass*: Imagine a group of several objects: Move away (in your mind) from the group until the cluster of individuals start to become a single homogeneous mass. Now move back down to the point where the mass turns once again into a cluster.

c) *Following a trajectory*: As we perceive a continuously moving object, we can mentally trace the path it has traversed and the trajectory it is about to traverse.

d) *Superimposition*: Imagine a large sphere and a small cube. Increase the size of the cube until the sphere can fit inside it. Now reduce the size of the cube and put it within the sphere.

3.3.4 Image schemas and spatial meaning

For the analysis to be carried out, I assume that meaning is based on cognitive structure (patterns of knowledge and belief) which is external to the language system, and works in the context of other cognitive structures. Thus, in my view, Johnson's − as well as Lakoff's − basic *image schemas* provide the preconceptual blocks for meaning, These blocks (up-down, in-out, path, etc. *image schemas*) are combined into *conceptual schemas* in Langacker's sense. The predicates analysed in this work respond to this author's scheme for meaning extension.

A linguistic form gets its meaning by 'profiling' − or 'highlighting' − a particular region or configuration in the relevant domain. Langacker's basic domains are "cognitively irreducible representational spaces or fields of conceptual potential" (Langacker, 1987: 48). They include time, three dimensional space, temperature, colour, taste, and pitch. One of the domains associated with a lexical unit might be more salient than others − primary domains vs. secondary domains (Langacker, 1987: 165). Physical space will be the most salient domain

for conceptualisation of prepositions. Ontogenetically, the *conceptual schema* must be previously elaborated in this basic domain in order for a speaker to acquire a spatial concept. This *conceptual schema* is associated with new instances so that the speaker is able to categorise these new instances. By means of this process the concept in question can be extended to new senses.

3.4   Construal

3.4.1   Universal aspects of construal

Preconceptual elements combine to form concepts. Langacker (1991 *b*, 1993 *b*) proposes certain universals of construal for this kind of combination. The term *construal* contrasts with *content*, in the sense that expressions which evoke the same *content* can nonetheless be semantically different, because they apply alternate *construal*s of that *content*. *Construal* is ubiquitous, so that it resides in ways of structuring, packaging, and portraying *content* that are applicable to any cognitive domain. There are different aspects of *construal* which are needed for an explicit account of semantic phenomena. According to Langacker (1993 *b*: 453) they could be judged to be universal, in the sense that they are analogous or parallel to visual patterns. The visual domain, however, is not claimed to constitute their origin, but rather to share them with linguistic conceptualisation, these patterns being of a general cognitive character. The aspects of construal are as follows (Langacker, 1993 *b*: 448ff.):

a) *Specificity*: It is the degree of precision and detail with which a situation is characterised. Thus the following sentences describe the same event but with different degree of *specificity*:

> *The tall, surly waiter viciously kicked an elderly woman's yelping poodle.*
> *The waiter kicked a woman's dog.*
> *The man struck a canine.*
> *Someone did something.*
> *Something happened.*

b) *Scope*: It refers to those portions of active domains that a particular expression selects and exploits as the basis for its meaning. Thus, the *scope* of *poodle* suffices to hold its referent, not the whole country or the whole universe; *kick* evokes a temporal scope when that event can take place, not a year or eternity.

c) *Prominence*: An element can be *prominent* or *salient* in diverse ways. One of them is *profiling*. Within the conceptual base subsumed by its *scope*, every expression profiles some substructure. Thus, the conception of *eye* provides a base or *scope* for further concepts like *iris, pupil*, or *cornea*. The profile of an expression is its referent within the conceptualisation it evokes. Two expressions may evoke the same content but differ semantically because of profiling different facets.

d) *Background*: It is an ability to conceptualise two distinct structures in relation to one another to entertain them simultaneously but asymmetrically, so that one of them is of primary interest. One example is metaphor, where a *source domain* provides the *background* used for construing a *target domain* (Lakoff and Johnson, 1980; Lakoff and Turner, 1989). Another example is provided by expressions like *triangle*, *three-sided polygon* and *three-angled polygon*; these are semantically different because the *background* of their compositional histories is distinct.

e) *Perspective*: It comprises diverse aspects such as *vantage point (orientation), mental transfer,* and *direction of mental scanning. Vantage point* refers to the position of the speaker with respect to the *content* expressed, as in the sentences:

> *John is in front of the tree* vs. *John is behind the tree*.
> *Jack is to the right of the tree* vs. *Jack is to the left of the tree*.

Mental transfer takes place when a conceptualiser imagines, or takes into account, how the scene appears to another observer. *Direction of mental scanning* implies that there is semantic contrast in the alternate directions in which the conceptualiser traces a mental path

in building up his conception of the scene. Such a contrast can be appreciated in the following sentences:

The scar goes from his ankle to his knee.
The scar goes from his knee to his ankle.

f) *Subjectification*: An entity is said to be construed objectively or subjectively to the extent that it functions exclusively as the object or subject of conception (cf. Langacker, 1991 *b*: 316ff).

g) *Setting and participants*: There is a tendency to organise a conceived situation in terms of a stable, inclusive *setting* within which smaller *participants* occur and engage in relationships. *Participants* interact with one another typically in force-dynamic fashion, and occupy some portion of a *setting* (location).

Construal is as important as *content* to an account of semantic structure and semantic universals (Casad & Langacker, 1985; Svorou, 1994). Every lexical unit, grammatical element, and grammatical construction imposes a particular *construal* on the specific *content* it evokes. In using a lexical unit we necessarily adopt its *construal* for immediate expressive purposes.

3.4.2   Construal and spatial meaning

Given a certain trajector, different prepositions express different degrees of locative *specificity*. Thus, *behind* is more specific than *near,* because it refers to a more tightly defined location in space with respect to an object. In regard to *at*, *on* and *in*, the first is the most specific, because the relative position of the trajector with respect to the landmark is more precisely defined.

The *scope* or *search domain* of a locative expression is the region to which it confines the object in question (Hawkins, 1984). Thus, the *scope* of *at* in the expression *at the computer* is different from the *scope* of *in* in the expression *in England*.[32]

Prepositions and other relational predicates *profile* certain types of relationships, where some entity stands out as the one the expression is concerned with locating, characterising or assessing (trajector), and another entity stands as the one with respect to which the trajector is assessed or evaluated (landmark).

Perspective has been argued to be a relevant factor in the contrast between *at* and *in* (Herskovits, 1986; Cienki, 1989), since *at* implies a remote point of view with respect to the *participants.* The role of perspective is clear in contrasts such as *in front of / behind,* or *right / left*.

Subjectification plays a role in the distinction of different senses of the same predicate. Thus, even though the trajector is always the profiled participant with respect to the landmark, either of them can be subjectified in the sense that it plays the agentive part of the relationship. Thus, the contrast between the expressions *volunteers at work* vs. *volunteers at a suggestion,* depends in part on the relative roles of landmark and trajector as the agentive or objective element of the relationship.

Each preposition imposes its construal on the situation described. The *conceptual image schemas* of *at*, *on* and *in* adopt different construal arrangements for spatial relations.

3.5   Idealised Cognitive Models (ICMs)

3.5.1   ICMs

Lakoff proposes an experiential basis for meaning (motivated by the structure of our experience). In order to be a *source domain* a schema must be pervasive in experience, well

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[32] It can be argued that it is *computer* and *England* themselves that provide the scope of the expressions, and not the prepositions. However, the fact that the prepositions here are not interchangeable indicates that they

understood because of its pervasiveness, well-structured, simple, emergent and well-demarcated. A crucial point in this argument is the following:

> Schemas that structure our bodily experience preconceptually have a basic logic. Preconceptual structural correlations in experience motivate metaphors that map that logic onto abstract domains. Thus, what has been called abstract reason has a bodily basis in our everyday physical functioning (Lakoff, 1987: 278).

According to Lakoff, the human capacity for conceptualisation therefore consists of the ability to form symbolic structures in correlation with preconceptual structures that are first created in our everyday experience (basic level and image-schematic concepts), and to project metaphorically from structures in the physical domain to structures in abstract domains. These projections will be constrained by other structural correlations between the physical and abstract domains, as determined by the *Invariance Principle* (cf. 3.7.2). At a higher level, the human capacity for conceptualisation is able to form complex concepts and general categories using *image schemas* as structuring devices. At an even higher or more complex level human minds construct complex event structures and taxonomies with superordinate and subordinate categories. These complex structures are called *Idealised Cognitive Models* (*ICMs*) and their structure is also based on *image schemas* and *basic level* concepts. According to Lakoff, these *ICMs* organise our knowledge, and category structures. Prototype effects are by-products of that organisation. Each *ICM* is a complex structured whole, which uses four kinds of structuring principles:

> a) propositional structure (Fillmore's frames).(cf. 3.6)
> b) image-schematic structure (cf. 3.3)
> c) metaphoric mappings (cf. 3.7.2)
> d) metonymic mappings (cf. 3.7.1)

Each *ICM*, as used, structures a *mental space* (cf. 3.8). *ICMs* may be of several types (Lakoff, 1987: 74ff.):

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are sensitive to scope specifications.

a) *Cluster models*: "cognitive models combine to form a complex cluster that is psychologically more basic than the models taken individually". Example: the semantic category *mother*.

b) *Metonymic models*: The description of *metonymic models* runs as follows:

> Given an ICM with some background condition (e.g. institutions are located in places), there is a 'stands for' relation that may hold between two elements A and B, such that one element of the ICM, B, may stand for another element A (Lakoff, 1987: 78)

Metonymic sources of prototype effects may be (Lakoff, 1987: 81ff.):

a) *Stereotypes*, which define normal expectations required to characterise the meanings of certain words, for instance the concept of *Thanksgiving dinner*, may be expressed metonymically by *turkey*.

b) *Radial Structures*, where the central member stands for the peripheric members, e. g. *over,* in order to express diverse spatial relations.

c) *Social Stereotypes*, which are conscious, but subject to change over time. They define cultural expectations, may be overtly challenged or become public issues, and are exploited in advertising and popular entertainment. Examples: *housewife, bachelor.*

d) *Typical examples*, which are unconscious and automatic, not subject to public discussion and not changeable over time, do not define cultural expectations. It is normal to make inferences from typical to non typical examples. Examples: robins as birds, apples as fruits, hammers as tools,...

e) *Ideals*, which are used to make judgements of quality and set goals for the future. They are assumed to have all the good qualities that non-ideal cases have, but not viceversa, for instance, an ideal speaker, an ideal Catholic, etc.

f) *Paragons*, which we try to emulate; we use them as models to base our actions on. We are constantly acquiring knowledge of *paragons* and regularly base our actions on that knowledge, for instance Chomsky as a *paragon* of engaged intellectual.

g) *Generators*: Single digit numbers generate the set of natural numbers by means of arithmetic rules, so that a subcategory generates larger categories.

h) *Submodels*, whose members are 'cognitive reference points'; used in making approximations and estimating size, e.g. primary colours, basic emotions, powers of ten,...

i) *Salient examples*: They stand metonymically for the entire category. They are used in making probability judgements, for example, *earthquakes in California*.

3.5.2   ICMs and spatial meaning

With regard to prepositions, their semantic structure can be described adopting a model of *radial category*. In a *radial category*:

> ...variants are not generated from the central model by general rules; instead, they are extended by convention and must be learned one by one. [...] The central model determines the possibilities for extensions, together with the possible relations between the central model and the extension models (Lakoff, 1987: 91)

Extensions are motivated by the *central models* plus general principles of extension. Some general principles found in *radial categories* are *centrality* (basic members of the category are central) and *chaining* (central members are linked to other members, which are linked to other members, and so on). Experiential domains and idealised models (both may be culture specific) can characterise links in category chains. Common properties to all members are not necessary but they may play a role in characterising the basic schemas within a given category. Motivation principles are not generative or predictive, in the sense that general principles make sense of the links, but they do not predict exactly what categories will be. Speakers must learn which domains of experience matter for classification. What is predicted is that systems of classification tend to be structured in this way and cannot be structured in other ways. To describe the system we need:

a) A basic opposition model which structures the centres of semantic categories with respect to one another. For spatial relational predicates I will adopt Deane's (1993) multimodal system.

b) A base model that specifies the distinct categories (here, all the spatial relational predicates that may appear in the prepositional construction).

c) A specification of central or most typical subcategories (one for each preposition). These will be the basic conceptual schemas for each preposition.

d) A specification of *chaining principles* (*image schema* elaborations and extensions). Each extension of a category needs to be independently motivated. At the same time, extended senses may themselves serve as the basis for further extensions via category chaining.

e) A short list of exceptions, distributed according to the basic opposition model (not all principles are used for the extension of every category).

3.6 Frames

3.6.1 Syntactic, semantic, and event frames

The concept of *frame* was introduced in linguistics by Z. Harris (1946) with the sense of syntactic environment of a certain syntactic category. This idea was incorporated by generative linguistics in the concept of *subcategorisation frames* (Chomsky, 1965). With the development of propositional semantics, the concept has taken on a semantic sense, particularly in Fillmore's *Case Grammar* (1968 *a*, 1968 *b*, 1975 *b*, 1977), and it has been incorporated by later versions of generative theory under different labels (semantic frame, case structure, argument structure, theta structure,...).

The advantage of Fillmore's semantic *frames* over syntactic frames resides in the fact that they can account for various clause patterns, so that a single *frame* can be applied to different verbs. Thus, the *frame* of BUY: A-BUYER, B-GOODS, C-MONEY, D-SELLER may be instantiated by *sell*, *pay*, *cost*, or *charge*. For example:

John	*bought* *a shirt*	*from Jack*	*for six pounds*
BUYER	*GOODS*	*SELLER*	*MONEY*

Buy provides a particular syntactic *perspective* by assigning a syntactic role to each participant. *Perspective* on the same EVENT can be changed by introducing other verbs:

Jack sold a shirt to John for six pounds.

Jack charged John six pounds for a shirt.

John paid six pounds to Jack for a shirt.

The same *frame* BUY can be used to explain the syntax of various other verbs. This approach goes beyond the FIGURE/GROUND approach in that it gives focus to all syntactic participants including adverbials. Here, the notion of *frame* is, nevertheless, purely linguistic:

> ...any system of linguistic choices − the easiest cases being collections of words,
>
> but also including choices of grammatical rules or linguistic categories - that can
>
> get associated with prototypical instances of scenes. (Fillmore, 1975 *b*: 124)

The use of this term in linguistics has also been influenced from AI. Minsky (1975), a computer scientist, tried to describe the way our world knowledge could be represented, using the term *frame* to refer to "a data-structure for representing a stereotyped situation" (Minsky, 1975: 212). This structure is a network of nodes and relations, i.e. all participants and the relations between them. *Default assignments* are values for slots in the *frame* that apply under 'normal' conditions. Minsky suggests that our knowledge should be represented in complex '*frame-systems'* (1975: 227ff.). While we need to make inferences based on our world knowledge, all our expectations based on our experience and stored in our long term memory are part of the *frame system,* and influence our ability to produce and understand the language related to it. Although Minsky develops his idea of *frame* within the context of giving an explanation of visual knowledge, he also points out that *frames* structure not just sentence units, but also discourse. He further argues that if we view situations from a sequential perspective, we go beyond simple *frames* and move into what he calls *scenarios*, i.e. "knowledge structures particularly designed for frequently recurrent event sequences". This notion has been subsequently denominated *scripts* (Schank & Abelson, 1977: 42ff). Thus the 'RESTAURANT SCRIPT' gives structure to our knowledge of the typical sequence of events that take place at a restaurant. Whenever we use language, we unconsciously fill in all the information taken from *frames* and *scripts* which is necessary to understand even the most simple pieces of discourse.

Under the influence of these notions from AI, Fillmore adopts a more cognitively oriented definition of *frame* in later works (Fillmore, 1982, 1985):

> ...system of concepts related in such a way that to understand any one of them you have to understand the whole structure in which it fits; when one of such structures is introduced into a text, or into a conversation, all of the others are automatically made available. (Fillmore, 1982: 11)

> specific unified frameworks of knowledge, or coherent schematisations of experience (Fillmore, 1985: 223).

This interpretation presents *frames* as cognitive constructs. According to this idea, every sentence evokes a certain cognitive perspective which implies a cognitive ability of directing one's attention. In other words, perspective depends on what attracts one's attention, and therefore, clause patterns cannot be seen in isolation but against their cognitive background.

A *frame* is a type of cognitive model which represents the structured knowledge and beliefs pertaining to specific and frequently recurring situations. *Frames* are reflected linguistically in the lexical relations and in the syntax of clauses, sentences and discourse.

More recently, Talmy (1991) used the *frame* approach to analyse event chains and causation. *Event frames* are sets of conceptual elements and relationships that co-evoke each other, and are shared by speakers. Thus the *frame* of a motion event consists of a set of central defining elements of the event: figure + ground + path + motion itself + MANNER of the movement + CAUSE. Five types of *event-frames* are distinguished: *motion, causation, cyclic, participant-interaction* and *interrelationship event-frames*. The cognitive process of foregrounding certain portions of an *event-frame* is called *windowing of attention*, whereas *gapping* is the reverse process, i.e. conceptual material which makes up part of an *event-frame* is backgrounded.

In short, a *frame*, and in particular an *event-frame*, provides a knowledge network that links the multiple domains associated with a given linguistic form.

3.6.2   Frames and spatial meaning

In the *frame* approach, not only subject and DO are addressed, but also IOs and adverbials. It has been used for the semantic analysis of verbs, and it may be used in the same way for semantic analysis of other relational constructions like prepositional constructions. I understand that each preposition − its semantic structure − evokes a certain cognitive perspective according to which the situation is conceptualised. Thus, Fillmore's explanation of alternative framings (Fillmore, 1982: 125) is useful to contrast the use of *at, on* and *in* for describing the same situation, under different conceptualisations. For example, *a man working at a tree, on a tree* or *in a tree*. Likewise, being *at a restaurant* activates the RESTAURANT SCRIPT, but being *in a restaurant* does not produce the same cognitive effect.

Furthermore, prepositions are linguistic devices which may be used to mark the focus of attention. In motion events they can provide *windowing* of different parts of the path, which is always conceptualised in its entirety. Thus, we have initial, medial and final *windowing*, as in *out of the airplane through the air into the ocean.* Talmy (1972) shows that different languages use specific framing devices, so that PATH and MANNER are reflected in different ways in various languages. Spanish is a *verb-framed* language (PATH is expressed by the verb) while English is a *satellite-framed* language. This fact is revealed by stylistic differences in the various languages, so that on the one hand, manner of the motion is expressed by English verbs vs. Spanish adverbials, and on the other hand, path of the motion is depicted by English particles vs. Spanish verbs; e.g. *The flower floated away vs. La flor se alejó flotando*.

The predicates analysed in later chapters show in some occasions a particular sense by virtue of the *windowing* they perform on a certain part of an event frame. In essence, *frames* are culture-based, conventionalised configurations of knowledge associated with basic level events. Most importantly, the knowledge encapsulated in a *frame* is knowledge which is shared, or which is believed to be shared, by at least some segment of a speech community. In the classical, feature theory acceptability consists of compatibility of feature specifications. On the contrary, in *frame* theory acceptability is a function of interpretability, given certain

background knowledge. To the extent that an expression is interpretable, it is accepted as well formed. This holds for prepositional constructions in the sense that the semantic contrast between certain prepositions depends sometimes on such considerations.

3.7   Category extension: Metonymy and Metaphor

3.7.1   Metonymy

The traditional view on metonymy runs that the name of one entity e1 is used to refer to another entity e2 which is contiguous to e1. One particular case is synecdoche where reference to the whole is made by reference to a salient part. According to Taylor (1989: 124ff), the entities need not be contiguous in any special sense. Neither is metonymy restricted to the act of reference. "There are countless instances in the lexicon of metonymic extension by the perspectivization of a component of a unitary conceptual structure." (Taylor, 1989: 125).

Following Lakoff (1987: 84ff.) metonymic models can be described as follows:

- A target concept A is to be understood for some purpose in some context.
- There is a conceptual structure containing both A and another concept B.
- B is either part of A or closely associated with it in that conceptual structure.
- Typically, a choice of B will uniquely determine A, within that conceptual structure.
- Compared to A, B is either easier to understand, to remember, to recognise, or more immediately useful for the given purpose in the given context.
- A metonymic model is a model of how A and B are related in a conceptual structure; the relationship is specified by a function from B to A.

Patterns of metonymic meaning extension could consist of the highlighting of certain aspects of one domain, and this process of making one component more salient can give birth to a new domain. The process of the metonymic origin of conceptual metaphor has been recently

pointed out by Ruiz de Mendoza (1997) and Barcelona (1997).What is it that permits the association between source and target domains? On what basis do elements in one domain come to be perceived as analogous to elements in another domain? In principle, the relation seems to be metonymic.

In brief, metonymy implies a mapping within a single model, i.e. one category within one model is taken as standing for another one in the same model (cf. 3.5.1).

3.7.2 *Metaphor*

Metaphor has been understood as deviant language by Generative Linguistics where meanings of words are bundles of necessary and sufficient features, and there are clear-cut boundaries between semantic categories. Combination of words in GG depends on the compatibility of the feature specifications of the component forms, compatibility being formalised in terms of selection restrictions. In this context, metaphor is captured by the notion of a violation of a selection restriction, and thus lies outside the study of linguistic competence. Semantics always deals with literal language.

Cognitive semantics does not view metaphor as a speaker's violation of rules of competence (Reddy, 1993; Lakoff & Johnson, 1980; Lakoff and Turner, 1989; Lakoff, 1993; Kovečes and Szabó, 1996; Lakoff & Johnson, 1997). According to this view, metaphor is a means whereby ever more abstract and intangible areas of experience can be conceptualised in terms of the familiar and concrete. It is motivated by a search for understanding. One cognitive domain can be understood, or even created, in terms of components more usually associated with another cognitive domain (Lakoff & Johnson, 1980).

Lakoff (1987: 271ff) contemplates the "possibility that many areas of experience are metaphorically structured by means of a rather small number of image schemas". According to this author (Lakoff, 1993) metaphor is the main conceptual mechanism through which we comprehend abstract concepts and perform abstract reasoning. Metaphors are mappings across conceptual domains that establish correspondences between entities in the target and

source domains, and can project inference patterns from the source domain onto the target domain. They are grounded in the body, and in everyday experience and knowledge, to the extent that they constitute a subsystem of our conceptual system. The system of conventional conceptual metaphor is unconscious, automatic, and constantly in use; it is central to our understanding of experience and to the way we act on that understanding; it plays a major role in both the grammar and lexicon of a language; part of it is universal, part of it culture-specific; it is ruled by the *Invariance Principle,* which states that image-schematic structures of source and target domains are consistent. This assumption implies, on the one hand, that the inference patterns of the source domain remain untouched in the target domain, and on the other hand, that only metaphorical mappings are possible when the inference patterns of the target domain are consistent with all or part of the source domain (cf. Lakoff, 1990; Brugman, 1990; Turner, 1990).

In conclusion, metaphors are not just figures of speech in literature, but also pervasive in everyday language. Furthermore, metaphors are not just language but also a conceptual tool to understand and create more abstract conceptual domains. Thus, the metaphor symbolised by the expression. TIME IS MONEY appears in expressions like *You are wasting my time; Can you spare a few minutes?; How do you spend your time?; We are running out of time; Is that worth your while?,* and leads the speakers of English to think of time in terms of money.

We have access to this type of conceptual tool that structures our way of thinking through the language we use. Metaphors are deeply entrenched in our minds, and function in an automatic, unconscious way. The most important metaphors are those that have been long conventionalised and built into the language, because they structure the conceptual system of speakers.

3.7.3 *Metonymy, metaphor and spatial meaning*

With respect to spatial semantic categories, I will try to show how certain aspects of the basic physical domain are highlighted to understand and create abstract domains.

What is transferred by a metaphorical mapping is the internal relations or the logic of a cognitive model. A metaphor is a mapping of the structure of a source model onto a target model. We rely on models of the concrete world to conceptualise abstract phenomena. Our conceptualisation of models of abstract categories is grounded in our more concrete experience with people, objects, actions and events. I suggest that this is the mechanism which the semantic categories *at, on* and *in* activate in order to be used in abstract domains, i.e. in prepositional abstract uses. In the analysis of these predicates, I will make an attempt at accounting for many, if not all, of their metaphorical extensions.

In the characterisation of the abstract usage of prepositions I rely on basic experiences in two ways:

1.- The general classes of objects, organisms and people are also used as source models for other abstract categories.
2.- Basic image schemas are used for the spatial conceptualisation of abstract domains.

One abstract model can combine several concrete models when the mappings are performed. The interpretation of linguistic expressions is highly context dependent, and must be carried out actively by the reader / hearer. In the case of prepositions, when these are used in figurative meanings, what we have is a metaphorical mapping from physical space onto conceptual space, since conceptual structure is understood in terms of *conceptual image schemas* plus a metaphorical mapping. *Conceptual image schemas* based on spatial experience are directly understood, they provide the conceptual basis for uses of prepositions in the physical domain, and are extended metaphorically to structure other domains. Polysemous predicates display one form that is mapped onto multiple domains. Thus, a single linguistic unit like *in* may express the conceptualisation based on Lakoff's container schema at the level of the physical domain. This is what has been traditionally called literal meaning. Conceptual schemas based on physical experience are mapped onto abstract domains. This conceptual space may be fictional, or may even not correspond to conceptual content referring to the real world, or other possible worlds, since we can structure discourse itself as a *mental space*, or even the communicative situation as a *mental space*. In Sweetser's words, speech acts and mental states are metaphorically 'travels through space'.

When trying to understand what the words refer to, we would better speak of *mental spaces* rather than real world, and many of those mental spaces are based on metaphorical mappings.

3.8   Mental Spaces

3.8.1   Conceptual, epistemic, and pragmatic mental spaces

Fauconnier (1985) defines mental spaces as:

> (...) constructs distinct from linguistic structures but built up in any discourse according to the guidelines provided by the linguistic expressions. In the model, mental spaces will be represented as structured, incrementable sets – that is, sets with elements (a,b,c,...) and relations holding between them (R1ab, R2a, R3cbf, ...) such that new elements can be added to them and new relations established between their elements (Fauconnier, 1985: 16).

Mental spaces provide a linguistic and cognitive means for setting up and distinguishing *frames,* but they are not conceived of as *frames* themselves. It is crucial that *mental spaces* are conceived of as packages of knowledge built up during ongoing discourse. This confers them a pragmatic nature. It is the speaker who, by means of linguistic expressions, or taking the communicative situation as background, creates those *mental spaces* to be referred to in the conversation. The success of the communicative act will be estimated according to the degree to which the speaker is able to create the same or similar *mental spaces* in the mind of the addressee. *Mental spaces* are therefore grounds for linguistic reference. Truth and reference to objective entities do not play a crucial role in the study of *mental spaces* as connected to the linguistic expressions that build them.

The study of *mental space* construction is fundamental for the explanation of natural language semantics and pragmatics. Apparent paradoxes of direct truth and reference assignment often arise from the failure to take into account properties of the intermediate

space constructions. As far as speakers talk about the physical world, *mental spaces* are found between this world and its linguistic expression. When speakers talk about abstract domains which cannot be seen or felt in reality, the distinction between *mental spaces* and referential domain becomes blurred. *Spaces* can be introduced by *space builders* or implicitly on pragmatic grounds (fiction, theatre, indirect speech, etc).

3.8.2   Mental spaces and spatial meaning

Spatial relational predicates seem to be able to structure different domains. In this way we can create *spaces* by means of spatial expressions. I suggest that spatial relational predicates may express the reference to abstract content domains, discourse domains or pragmatic domains created by the predicate itself. They refer then to *mental spaces*, and not directly to the world. Fauconnier calls this phenomenon *space-building*:

> I shall call space-builders expressions that may establish a new space or refer back to one already introduced in the discourse. [...] space builders may be prepositional phrases (in Len's picture, in John's mind, in 1929, at the factory, from her point of view). (Fauconnier, 1985: 17)

I identify conjuncts, disjuncts and sentential adjuncts introduced by spatial relational predicates as *space-builders* in Fauconnier's sense. Thus, quoting Fauconnier's examples, sentential adjuncts can introduce temporal spaces:

> *In 1929, the lady with the white hair was blonde* (Fauconnier, 1985: 29),

or space spaces, where geographical spaces are also linguistic, as in

> *In Moldavia the president is a tyrant* (Fauconnier, 1985: 30),

or, as Fauconnier illustrates, domain spaces, where a domain of activity, game, field of science, sport, type of literature, etc. can be processed linguistically as a mental space, as in:

In Canadian football, the 50-yard line is 55 yards away.

In Martian chess, the bishops are castles.

In Rubik's new theory, transformations are phrase structure rules and phrase structure rules are transformations.

In this new Californian religion, the devil is an angel (Fauconnier, 1985: 31).

We can interpret mental spaces in three distinct ways: as spaces of content, as spaces in the epistemic world, and as spaces of the speech acts performed via the utterance of the clauses in question. The interpretation actually given to a prepositional phrase is, therefore, pragmatically determined. Taking into account that an utterance is content units plus epistemic logical entities plus a speech act, understanding depends on choice among these (Sweetser, 1990).

When spatial relational predicates are used figuratively, if they are used as *space-builders* – in Fauconnier's sense – the trajector of the predication may be considered as the whole set of mental constructs that the speaker locates in the *mental space* introduced, which plays the part of landmark. In the case of sentential adjuncts, the trajector identifies with the whole situation depicted by the sentence introduced. For disjuncts and conjuncts, the prepositional predicate builds an epistemic or pragmatic *mental space*, so that all the arguments that follow will constitute the trajector.

3.9   Polysemy models for spatial relational predicates

3.9.1   Coherence in spatial polysemy

The polysemy of prepositions is usually looked on as a chaotic list of idiomatic and abstract senses that have nothing to do with one another[33.] In view of this, attention has generally been restricted to central senses.

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[33] For example, the semantic classifications by Downing & Locke (1992: 597-601), and Dirven (1993).

Cognitive Linguistics, however, has produced several attempts at showing the structure of prepositional polysemy. Brugman (1980) shows that *over* is a highly polysemous lexical unit. She claims that it is not possible to find a *core sense* of *over*, i.e. a single configurational feature that should be common to all the senses of the preposition. Therefore, a prototype / family resemblance model for the description of polysemy is applied, some senses being more prototypical and others more peripheral. The limits of the category are fuzzy and overlapping with other prepositions is not discarded. For the first time *image schemas* are used instead of features in order to give an account of meaning.

For Lindner (1983) the central problem is whether particles like *out* and *up* are meaningful in Verb Particle Constructions (VPC), i.e. whether the VPC is analysable. The author claims that particles almost invariably contribute to the meaning of VPCs. *Out* and *up* each have several distinct senses, both concrete and abstract, and these senses are related, so that *out* and *up* comprise unified concepts. The author examines corpora of 600 VPCs with *out* and 1200 with *up*. Each semantic structure (*out* and *up*) is characterised as a schematic hierarchy, a network of specific meanings together with the generalisations (SCHEMAS) speakers extract from them at various levels of specificity. Three major subschemas are posited for OUT (*removal*, *expansion* and *departure*) subsuming a variety of spatial configurations as well as metaphoric extensions into abstract domains. For UP two major subschemas (*vertically higher* and *approach*) are linked via a chain of family resemblances. In some domains UP and DOWN or IN and OUT are not opposites but UP and OUT are.

These authors use the *lexical network* spatial metaphor to describe the distinct though related senses of single predicates. This metaphor has been used ever since in the description of prepositional polysemy in different languages (e.g. Cuyckens, 1993, 1994, 1995, for Dutch; Vandeloise, 1991 for French; Schulze, 1991, 1994; Dewell, 1994; Vandeloise, 1994; and Boers, 1996, for English). But the exact configuration and characteristics of *lexical networks* for prepositional polysemy has not been yet agreed upon (cf. Sandra & Rice, 1995).

3.9.2   *Models for lexical networks*

According to Rice (1996) *lexical networks* are usually described as:

> ...integrated structures containing multiple, linked nodes. These nodes are ambiguously taken to represent either separate senses or separate usage types of the lexeme in question [...] The nodes extend out from a central node whose value is commonly taken to be the prototype of the entire lexical category [...] the nodes are understood to be situated conceptually at varying distances from one another and from the semantic center (Rice, 1996: 136)

The two most adopted models for *lexical networks* are Lakoff's (1987) and Langacker's (1991 *b*), but some modifications to these models have been recently proposed (Rice, 1996).

3.9.2.1 Lakoff's lexical network

Lakoff's representation of Brugman's data is a proposal for a polysemy network based on a radial structure for conceptual categories (Lakoff, 1987: 436). He posits a network organised around a single core member out of which all other members extend (See figure below).
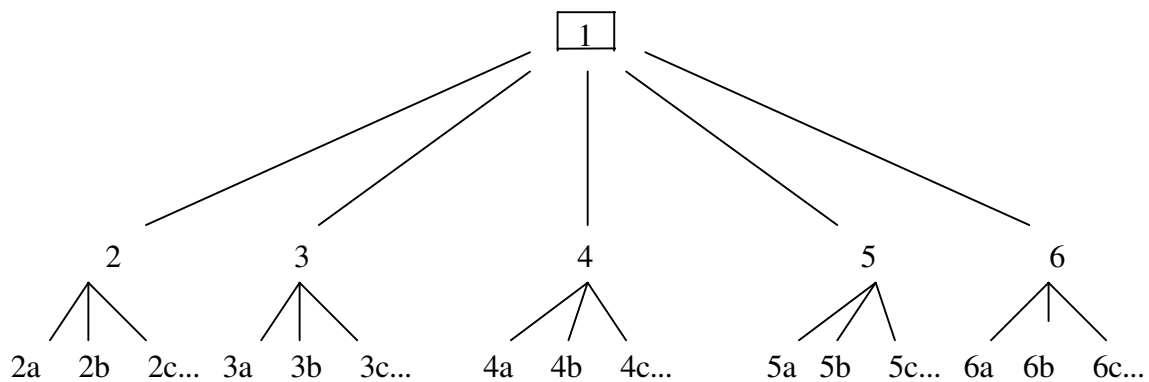
Fig. 3.1: Lakoff's network.

He shows the precise relations among the spatial senses, and his aim is to describe the metaphorical extensions of the spatial senses. He characterises the links between nodes as *image schema* transformations, but in fact he uses a system of primitive features (*extended, vertical, contact, path, no contact, end point focus*) On the other hand, in spite of his initial aim, he only deals with spatial uses. The number or nature of features is not systematic, and they seem to have been created *ad hoc* for the preposition *over*. The sense considered as the

core sense is not justified as such, i.e. no cognitive, semantic or acquisitional parameters are introduced for determining that sense as the *core sense*.

3.9.2.2 Langacker's lexical network

Langacker (1991 *b*: 266-272) proposes a taxonomy of node types where each node corresponds to what he calls 'established senses'. These are all connected by arrows indicating the particular categorising relationship which links each sense to other senses. This relationship is one of *specialisation* if it "holds between a schema and a structure that elaborates or instantiates the schema" (symbolised by a solid arrow); or it may be a relationship of *extension*, if it implies some conflict in specification between the basic and extended values, i.e. the extended value is incompatible with the basic one in some respect, but is nevertheless categorised by it (symbolised by a dashed arrow).

Stage 1:   *schema1*

Prototype   specialization1

Stage 2:   *schema1*

prototype ——— specialisation1 specialisation2 ---->extension1 ...

extension2 —— specialisation3...
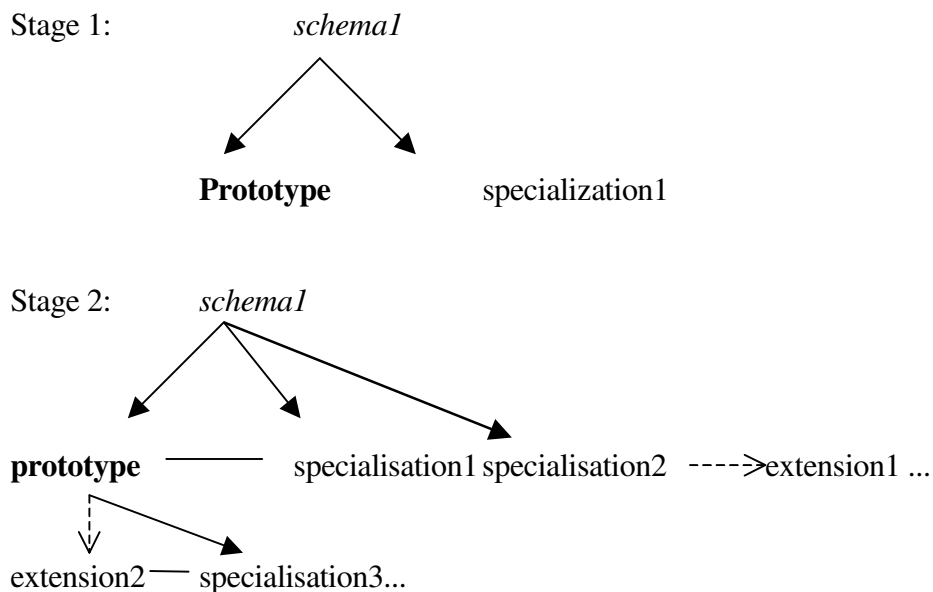
Fig. 3.2: Langacker's network:

Networks may form around prototypical schematic values − experientially based *conceptual archetypes* (1993 *a*: 3).

3.9.2.3 Rice's lexical network

Rice (1996: 142) suggests the possibility of several prototypes for a single lexical category. A schematic node may develop which sanctions both the old prototype and several new extensions, thus becoming a new prototype itself. Novel senses are only detectable at the periphery of the category, based on extension from already extended senses. This model tries to account for all uses, spatial as well as abstract. Here the notions of *prototype* and central member or *schema* must be clarified. While categories might merge into each other at their boundaries, prototypical members of different categories are kept maximally distinct.
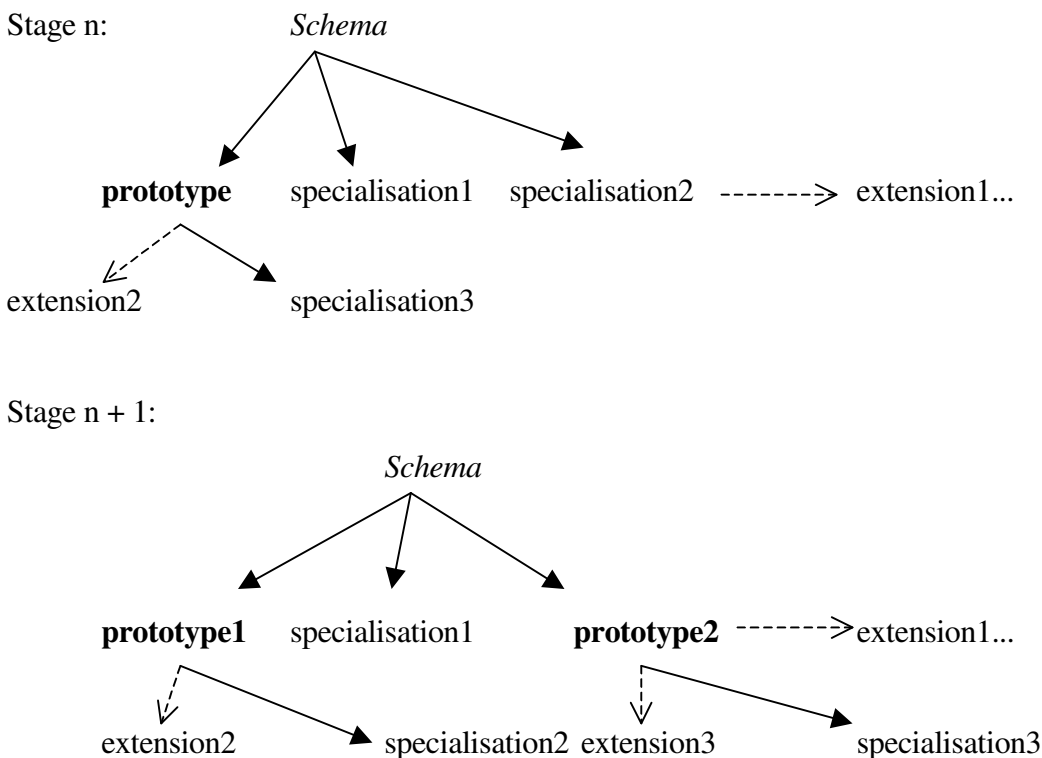
Figure 3.3: Rice's network

A central member or *schema* of a family resemblance can be most plausibly and most economically related to other members. It does not have the same psychological status as the *prototype*. In Rice's model, the central schema represents the origin of the category − both ontogenetically and philogenetically − and it is the member to which all others most easily

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relate. On the other hand, the *prototype* (or *prototypes*) are the most salient members, members whose attributes show the highest *cue validity* for that category, which keeps them maximally distinct from *prototypes* of other categories. The type of network proposed in this dissertation derives directly from Rice's scheme.

4. THE SEMANTIC STRUCTURE OF *AT, ON, AND IN: STATE OF THE ART*

4.0 *Introduction*

Traditionally it has been assumed that the preposition *at* should be used in those cases where its object is to be conceptualised as a point, in contrast with *on* and *in*. O*n* is assumed to take objects seen as lines or surfaces, and *in* to take objects that are conceptualised as areas or volumes. It is a foreign learners', as well as native speakers', general assumption that this explanation provides a reliable account, and a useful clue for the use of these words. That assumption is not completely true, because it only holds for a reduced set of contexts. In fact, no one whose native language is not English can rely on it for a correct and native-like use of these units, which shows that there remains much more to be said about the meanings of these units. Grammar books still base their descriptions on the aforementioned contrast. We find examples like the following:

> *The train is at the station now*
> *The train is in the station now*
> *Are you going to the summer school at Oxford?*
> *I don't like it in Oxford*
> (Dirven, 1989: 522-523)

According to Dirven, the difference in meaning between *at* and *in* should be grasped as long as a station can be seen as a point in a village, and a town can be conceived of as a point in a country. The author also mentions functionality (but only as a by-feature), and the conceptualisation of the complement as a point or a volume is the central issue in the description. It seems obvious that the problem with this description resides in the fact that speakers do not think of the whole country whenever they mention a town, just as they do not conceive of the whole town whenever they mention the station in that town. These concepts – *country* and *town* respectively – do not appear anywhere in the context. Therefore, we should

not turn to them in order to explain other meanings which are in fact there. An analogous description is found in Quirk et alii (1985: cf. 9.15).

The standard version which grammar books offer us reduces the semantic structure of locatives to either geometric or topological descriptions, or both combined. It has not been challenged by any of the semantic accounts provided by linguists. In the following sections I review the main and deepest analyses of the semantic structure of *at*, *on* and *in* up to the present. First, I present a summary of Lindkvist's comprehensive description (Lindkvist, 1950). Subsequent studies of English have tried to systematise, and encapsulate in various theoretical approaches, the usages initially described by Lindkvist. Two main positions may be observed:

a) Prepositional meaning is defined as a *core sense*. Within this position two trends may be observed:

> 1- All the uses of a preposition are reduced to a *core sense*, which is the one introduced in the lexicon, and the context provides other aspects of meaning which do not belong to the preposition (Leech, 1969; Bennett, 1972, 1975).

> 2- There is only one meaning that occurs in a variety of contexts. These contexts introduce nuances of meaning that can be assigned to the preposition, but the *core sense* is in all of them (Miller & Johnson-Laird, 1976; Herskovits, 1985; Wierzbicka, 1993).

b) Prepositions are polysemous: There is a prototypical sense and other non prototypical senses. Within this position there are two approaches:

> 1-There is a preference rule system that determines the prototype (Ciencki, 1989).

> 2-The different senses of a preposition can be derived from a basic *image-schema* by means of family resemblances and image schema transformations (Brugman, 1980;

Lindner, 1983; Hawkins, 1984; Lakoff, 1987; Vandeloise, 1991; Schulze, 1991, 1994; Dewell, 1994; Boers, 1996).

In the *core sense* approaches, the description of *at*, *on* and *in* has mainly followed either the traditional conception of the landmark as a geometrical concept, or the conception of these particles defined in merely topological terms. But these approaches cannot explain why the same unit is used with different senses, or which is its use in abstract domains. The difficult way implies accepting that the different senses of a preposition are related, as well as trying to find what type of links lead from one sense to the others. The polysemy approach adopted in this work tries to introduce further aspects such as the function of the related entities, and the type of interaction between them.

4.1   The Descriptivist approach

4.1.1   G. Lindkvist

Lindkvist (1950) provides an encyclopaedic account of the many different contexts of *at*, *on*, *in* and *to* in the syntactic construction NP P NP, excluding temporal and abstract usage. I present a summary of his account of *at*, *on,* and *in* using his own terminology and examples (sections 4.1.1.1, 4.1.1.2, and 4.1.1.3)

4.1.1.1 *At*

The complement-as-point conception appears pervasively in Lindkvist's study. The uses described for the preposition *at* are the following (Lindkvist, 1950: 129ff.):

a) *Location in close proximity to an object*[34].

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34 The author points out that *at* cannot be used to indicate proximity with complements denoting persons, and *by* is used instead. According to this last comment, we should understand that both prepositions are in complementary distribution, i.e. they have the same meaning. I do not agree with this idea, as I shall show later, since the meaning of *at* is somehow different, in my view.

"At is used to indicate location of an object at a point (or what is apprehended as a point) in close proximity to something". Localisation is vague, and "the presence of the object is more strongly emphasised than the nearness as such"(Lindkvist, 1950: 129). With geographical complements, such as towns, or geographical areas denoting a point within an area. Examples (Lindkvist, 1950: 129):

> *He turned to the policeman who stood at the door...*
> *...in a battle fought at Woodbury,...*

b) *Location within an area or space or on a surface apprehended as a point.*

The usages included here imply a general indication of locality in the form of a point in space where something is present.

At is used with geographical areas: in the expression *at sea* indicating situation on the great expanse of salt water; islands only when the intention is to give a general localisation, with no attempt at description (the island is thought of as a point in space, so that large islands cannot take *at*, particularly countries); cities, towns, boroughs, suburbs, villages, and hamlets to indicate that something is located within the areas constituted by them; parts and quarters of towns; areas containing buildings and other requisites serving certain purposes such as *farm, state, camp,* and *station*. Examples (Lindkvist, 1950: 133-142):

> *On Monday morning, December 5, he will attend a meeting of service chaplains stationed in Malta and later will speak to men of the destroyer command at Malta.*
> *...the unfortunate Theodore, King of Corsica, who died at Soho in 1756, as a tablet on the west wall of the tower records.*
> *The most striking perhaps is the great stone barn at Chale Manor Farm.*

At is used with buildings that are centres of activities peculiar to them, in the sense of general localisation in the form of a point in space. Example (Lindkvist, 1950: 143):

The two bronze candlesticks are copies of those at St. Bavon's , Ghent, said to have been in Old St. Paul's.

c). *Relative position.*

At is used to indicate a specific position in a whole : with the noun *point* as a complement to indicate an exact spot, real or imaginary, without reference to space occupied, where something is located in a whole or a series. Also with the nouns *level* and *plane* (as a point situated in a scale); with complements denoting high or low points like *summit, bottom, base, top,...*; with complements to indicate the front, hind or central part of a whole or series, like *beginning, commencement*, *end, close, back, rear, centre, middle* (when the point conception is outstanding) (*on* and *in* also occur in this context); with extremities and borders (part of a whole), with the words *extremity, edge, rim, limit, frontier, border*, and *boundary;* with the points of the compass: *north, south, east, west*. (on and in also occur in this context); with parts of the human or animal body, or articles of dress to define the point, or part where a particular state, condition, or circumstance may be observed or perceived; with all kinds of complements when their function is to indicate a point or stage in a whole, a series, or a continuity; after the verbs *begin, commence, stop*, *halt, pause, draw up*, *end, finish*, to indicate a point in a whole or continuity where starting, stopping, etc. takes place. Examples (Lindkvist, 1950: 144-156):

Delightful position at the top of a gentle rise.
If India .. were not to intensify its import restrictions at the frontier, Pakistan's active
balance with India would probably increase.
Bembridge attractive seaside resort and yachting centre at extreme east of island.
At No 10 Hyde Park Place is the smallest house in London.

To indicate relation in respect to direction or side: with parts of the human or animal body to indicate the direction in which, or the side on which, an object is located in relation to the body (it often implies a certain degree of nearness to the part of the body); with the nouns *side, hand, right, left*, *at* indicates close proximity, collateral position as a point in a whole; with the noun *back,* relative position; with the points of the compass, relation to other objects;

with the geometrical terms *angle, tangent*, the angular relation between two objects. Examples (Lindkvist, 1950: 156-160):

> *At his elbow the record reeled out its loudness, the words were raucous ..*
> *Our favourite walk from 'Stonelands' was up the Fell at the back of the house,...*
> *Nova Scotia, New Brunswick, and Prince Edward Island, the maritime provinces of*
> *Canada, form a group by themselves at the south of the Gulf of St. Lawrence.*
> *... thin slabs [...] split along planes standing at high angles to the horizontal.*

To indicate a relation of remoteness: in expressions like *at hand, at arm's length, at a stone's throw*, and *at close quarters*; with measures of length defined by numerals or the like; with the nouns *altitude, elevation, height, depth*, and *distance*. Examples (Lindkvist, 1950: 160-164):

> *The patrol opened fire at 300 yards.*
> *... a powerful electrical pumping installation at a depth from 28 to 29 ft.*

d) *Location close to or within a body, surface or area thought of as being used to serve a certain purpose.*

At is used with complements denoting different things which according to their nature are objects or centres of special activities, to indicate that the activity connected with such a thing is carried on close to the thing (close proximity). "...the sense of locality often succumbs more or less completely to the idea of activity... (e.g. she was at the telephone=she was telephoning)" (1950: 165). Also, to indicate activity with place-names, to denote an event having occurred near the place. Examples (Lindkvist, 1950: 165):

> *...forty-three Protestants in the reign of Mary suffered death at the stake.*
> *Henry V spent Christmas at Eltham Palace after his victory at Agincourt.*

Activity within a space or area: With complements denoting human habitations, or parts of these, to indicate that they are being used according to their purpose, or an activity that is characteristic to the place. For example, courts of law, sovereign's courts, places of employment and work. Example (Lindkvist, 1950: 170):

The Prime Minister has now resumed his normal duties at 10, Downing Street

e*) Motion and Direction.*

To express completed action *at* is used after a number of verbs and phrases expressing motion in the form of a completed action. The motion lies wholly within the verb and is not transferred to the preposition which also indicates the end-point of the movement. With *place, put* and *set*, and with verbs denoting movement or removal downwards like *fall, drop, deposit, pour, alight, kneel, sit, seat, settle*. Verbs that denote the act of reaching like *arrive, land, appear, turn up, emerge; touch, put in, call* (as nautical terms); *look in, drop in, call* (meaning pay a visit); *visit, put up*, and *come at* + person (= come into the presence of). Examples (Lindkvist, 1950: 178-183):

> *The rocks [...] have been deposited in layers at the bottom of a sea.*
> *I do hope the train will arrive punctually at Göttingen.*

Motion into contact is expressed with *at* when the purpose of the action is the contact, not the movement. With *at* the activity is often a continuous one, and its direction *not from above* (my emphasis[35]). *At* is preferred to *on* in cases of intentional maltreatment. *At* is also used after verbs and expressions denoting ringing, to indicate the surface in contact with which the ringing is brought about, and with verbs of pulling and tearing, "indicating a prolonged action or act". I disagree with this view, since prolongation is expressed by verbal aspect or adverbials in all Lindkvist's examples. Examples (Lindkvist, 1950: 184-187):

> *I hammered at the door, but I could not make the people hear ..*
> *.. to ring at the front door.*
> *And then our guide was pulling at my arm.*

Direction of a movement: *At* is often used to indicate the goal towards which the movement is directed, but without denoting in itself that the moved or moving object comes into

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[35]This feature will be relevant in our discussion of the meaning of *at*. (cf.§ 6.2)

physical contact with the goal. Implying attack: *run, rush, fly, spring, leap, dash, pounce, charge, have, go, come*. Movement is thought of as horizontal with *at*. With acts of throwing: *throw, hurl, fling, let fly, spit*, etc. With verbs of grasping, clutching: *grasp, clutch, snatch, catch, reach, snap, nibble, bite*). With *come* and *get* in cases where there is understood to be some difficulty in reaching the goal. After the verb *be*, to indicate the person or thing attacked (on is also used). After verbs of aiming, or pointing: *aim, level, present, strike, make a lunge, shake one's fist, nod, wave*, etc. Examples (Lindkvist, 1950: 187-194):

> *...the bull came at me with his head down...*
> *... Jeremy had thrown his note at him.*
> *Recovering himself he grasped at the balcony.*
> *...just let me come at you!*
> *They have been at me for a subscription.*
> *He waved his hand at the shining whiteness below.*

Direction without movement is indicated in expressions that denote production of sounds and noises by living beings with a view to expressing thoughts, feelings, etc, like *shout, roar, cry, yell, bawl, scream, hoot, bellow* (attack on a person), s*wear, bark, growl, snarl* (attack, threat); *talk, speak, preach* (aggressiveness, verbal attack), l*augh, smile, frown, scowl, make a grimace, make faces, wink,* to indicate the person towards whom an expression on a person's face is directed (s*mile, beam, frown, scowl* can also take on). With *look* to indicate the object. *Look on* emphasises the fact that the look is prolonged, fixed and intent, or absent and void of expression, and it contains a feeling or emotional reaction (*at* is also common); *look to* indicates direction particularised by *away, across, over*, etc. (*at* is also common). With verbs of sight: *glance, peep, leer*, etc.; staring: *gaze, stare, glare, pore, peer* (also *on*). Examples (Lindkvist, 1950: 195-203):

> *Baldock was shouting at him.*
> *Staire fancied that Jeremy laughed at him...*
> *The two women sat and looked at him.*
> *Mr Stevens glanced uneasily over his glasses at his daughter.*
> *He stared stupidly at her, his mouth open.*

Motion and direction through an object: The direction is *in at* or *out at* an opening. *At* represents the opening as a point where something enters or issues. Example:

> *Smoke issued forth at several orifices.* (Lindkvist, 1950: 206)

Motion and direction from an object: Only in the two figurative uses *at the hands of* and *at the mouth of*. Example (Lindkvist, 1950: 206):

> *...for some weeks he suffered more hell at the hands of doctors and nurses.*

4.1.1.2 *On*

With regard to the preposition *on*, Lindkvist makes the following distinctions (1950: 207ff.):

a) *Horizontal position on an elevation.*

On indicates that an object is situated in a mainly horizontal position in contact with or supported by an elevation serving as a foundation, with complements denoting: parts of buildings and other structures considered as elevations; mountains, hills, and rocks; islands, as compared with the level of the surrounding water (less often with proper names of islands); peninsulas, promontories, and capes; roads, paths, railways, and pavements (with a hard smooth surface artificially levelled and prepared, or raised); spots or places, as tiny areas slightly raised in relation to their immediate surroundings, and distinct from them; persons and animals or their mental equipment, to indicate that a mental or physical phenomenon rests like a weight on a person. Examples (Lindkvist, 1950: 208-218):

> *He stood sullenly erect on the stack, not daring to go down,....*
> *Then he sat on the verandah, smoking his pipe, ...*
> *I stand on the little hill from which Napoleon first saw Moscow ...*
> *I think that the smaller an island on which an intelligent man is born, the more cosmopolitan he becomes in later life.*
> *Motors are allowed only on the metalled roadway running southward ...*
> *Other interesting plants found on the wet spots include the buck-bean...*

b) *Position on a horizontal surface*

On is used to indicate that an object is situated in contact with or supported by a mainly horizontal base, not considered as bounded on its outer sides or forming an enclosure. *On* is used with complements representing: the earth as a planet, or other heavenly bodies, large or small stretches of the solid surface of the earth like *land, mainland, continent, ground, soil, plain, prairie, moor*, *lawn, green, grass, farm, estate, field, yard, court, street, lane, boulevard, esplanade*, etc., and parts and forms of the body of water that covers part of the earth, like *sea, lake, river*, etc. Examples (Lindkvist, 1950: 219-228):

> *In a little while it seemed to me as if I had always been alone on the moon.*
> *Halifax is the most English-looking town on the American continent.*
> *The boat was upside down on the sea.*

Position on a down-turned surface is expressed with complements denoting the perceptual or temporary underpart of an object, to indicate that its down-turned horizontal surface forms the foundation or supporting surface of the whole object. Example:

> *I lay flat on my back on the dining-room hearth-rug...* (Lindkvist, 1959: 229)

c) *Position on a non-horizontal surface*

It is not important whether the contact with the surface is from above or from elsewhere. *On* indicates the surface of application or point of suspension with which the object is maintained: with object surfaces, human or animal bodies; with the verbs *have, carry* and *bear* to indicate that a person carries something hidden in his clothes; with complements denoting axis, pivot or centre. Examples (Lindkvist, 1950: 230-233):

> *On the walls, besides, are old line engravings of the eighteenth century...*
> *Where the hell are my glasses? − On your nose*
> *..the circular top of the cylinder was rotating on its body*

On may be used to indicate the location of an object on the same level as a surface, and it often forms part of that surface. It is used to express that something is engraved, written, drawn or painted, or with complements denoting the human or animal body, or a part of it, and the human face or a part of it. Examples (Lindkvist, 1950: 234-236):

> *In a leading article, on a later page, we argue that...*
> *The wounds on Snowball's back... had been inflicted by Napoleon's teeth.*
> *Boys in uniforms, [...] and on their faces an expression like the letters of a legend...*

On may be used to indicate location in front of a background, without contact. Example:

> *... a red flare on the sky far off,...* (Lindkvist, 1950: 237)

d) *Location close to, in contact with, or along a line*

The line forms an essential ingredient in the notion expressed by the complement. It is used with complements denoting roads, railways, streets, rivers, lakes, seas, coast, shore, bank, beach, boundary lines in general, the equator, the horizon, etc. and with the terms *level, plane* and *line*. Examples (Lindkvist, 1950: 238-243):

> *Four large rooms in house on main road available.*
> *York is situated on both banks of the Ouse.*
> *On the southern coast, and just on the boundary line between Alaska and Yukon.*

e) *Relative position*

On defines the position of an object with relation to another, with complements like: *side, flank* and *hand*; *right* and *left*; the points of the compass; and, in nautical language, with the nouns *beam* and *bow*. Examples (Lindkvist, 1950: 244-248):

> *A door on the right leads to the King's Robing Room...*
> *On the south of the House is a loggia, overlooking the Park and the Observatory*

f) *Location in connection with a body or surface thought of as being used to serve a certain purpose.*

The complement is used not only as a support, foundation, surface of application, point of suspension, line, etc. but also for some other purpose, either by having a definite function or by being the centre of an activity peculiar to it. The complements denote: areas containing dwellings, such as farms or estates, buildings, places, etc., objects that according to their nature may be used as instruments in an activity or state; places of employment and work, or a collective of which somebody is a working or otherwise active member (staff, board, committee); lists; certain parts of the human or animal body used for the purpose of serving as a means of conveyance; it is also used with other means of conveyance, like ships, trains, trams, buses, etc., or with means of communication used to convey sounds, or light phenomena; certain elevations and supporting surfaces to indicate that they are used for their purpose as resting places. Examples (Lindkvist, 1950: 249-261):

> *Her father had had a sister who lived on a farm...*
> *He then got work on a water-boring plant at Merseburg, near by.*
> *... travelling by land was on foot or on horseback over moorland tracks.*
> *... he had married a woman met on the boat going to India!*
> *I can remember sitting on a stool on one side of the fireplace.*

g) *Motion and Direction*

On may indicate a movement that ends with something being placed in a horizontal position on a foundation, upwards, from a lower level, downwards, from a higher level, or sideways on the same level. Examples (Lindkvist, 1950: 263-265):

> *Along the shore may occasionally be seen the sea-otter, when he comes up on a rock*
> *to enjoy a feast of sea-trout...*
> *He had put down the cup on the little table hooked to the side of his bunk.*

Motion into contact. It may indicate violent contact, collision or attack, or the application or suspension on a surface or point. Movement downwards may be indicated by verbs like *fall,*

sink, lay, *stretch*, expressions denoting the act of treading, leaning and reclining to indicate pressure, verbs of throwing like *throw, cast, hurl, fling,* and *dash*; finally, the complement may denote the underpart of an object which comes into contact with a surface upon which the object comes to rest after movement. Examples (Lindkvist, 1950: 267-270):

> *A stone ...fell on the deck at his feet.*
> *Some one had trod on the skirt*
> *He flung it down on the ground, in the midst of the circle...*
> *...all the animals... flung themselves flat on their bellies and hid their faces.*

Movement downwards or sideways is expressed: with verbs of beating (*beat, strike, smite, smack, punch, hit, bump, pound, bang, thump, slap, tap, pat, clap, rap, knock, kick, hammer, drum, blow*), with verbs of motion like *rush, fly, spring, come, set, pounce* and reflexive verbs like *throw oneself*, and with complements denoting persons or animals, or their mental equipment to indicate that a mental or physical phenomenon is taking possession of the person or his mind. Movement sideways is expressed with verbs like *encroach, entrench, infringe, trespass*, etc. Examples (Lindkvist, 1950: 271-279):

> *Something in the enclosing water struck Coke violently on the head.*
> *... I felt the air rush in hot tongues on us as shell after shell burst at the exit.*
> *But now fear crept on him from every side.*
> *He put his big fingers cautiously on her eyes, into two little pools of tears.*

Motion or extension on to a line may be expressed by *on* with the complements *level* and *line*, and after verbs like *border, abut, verge,* and *march.* Examples (Lindkvist, 1950: 281):

> *Yukon borders on Alaska, and is a well-known mining district...*
> *... stooping so as to bring his head on a level with that of Mr. Pickwick,...*

Motion on to an object serving a certain purpose, such as buildings, structures, areas; instruments; places of employment and working or otherwise active groups of people; lists registering certain groups and categories of persons; conveyances; and resting places where a living being stations itself or carries on some activity. Examples (Lindkvist, 1950: 282-285):

> *We will put on this commission the ablest men we can find...*
> *Had Sarah Ann Atkinson received an education befitting her abilities, her name would*
> *doubtless have been writ large on the roll of eminent Englishwomen.*
> *Jump on the bus.*

On may express motion towards a goal without reaching it. The movement may be figurative. This includes: hostile actions (*march, attack, assault*, etc.); the use after the auxiliaries *be* and *have* implying attack; the use after *close* and *turn the key* to indicate a movement that encloses or confines an object and thus obstructs its exit; phrases like *shut (close, lock) the door on, the door closes on,* indicating movement towards a person in order shut him out or drive him away; *pay a call on, look (drop) in on* to indicate that a brief visit is paid; after the verb *turn,* when the complement denotes a living being and the movement is sudden, or due to feeling; after *shine*, *gleam, blaze, reflect,* and *cast a shadow*; after *smile* (friendly), *beam, frown* and *scowl*; after *look, stare, gaze, glare, pore,* and *peer* indicating prolonged, fixed and intent, often downwards and emotional looking; and, expressions denoting looking or staring like *fix one's eyes on, set eyes on, spy on*, etc. Examples (Lindkvist, 1950: 286-298):

> *...six months later Hitler's legions marched on Prague and resolved all doubts..*
> *After breakfast the key is turned on you till half past eight.*
> *She had replied to his letter with a note urgently requesting him to call on her.*
> *I turned on the goad-bearer behind me with a swift, threatening gesture.*
> *There was a wonderful peace and clearness about the scene on which he looked.*

4.1.1.3 *In*

According to Lindkvist (1950: 24ff.) *in*, used in a local sense, indicates:

a) *Enclosure within a body.*

In indicates the body in the interior of which an object at rest, in motion, or in action, is situated. The enclosure may be complete or incomplete, because one or more sides of it may be missing, or because part of the object enclosed may be outside the enclosure. Examples:

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Total enclosure:

Her evening dresses hung in the cupboard (Lindkvist, 1950: 24)

Partial enclosure:

He led the way into the hotel, found a quiet table in a corner and ordered drinks.
(Lindkvist, 1950: 25-26)

With this sense *in* is used with complements denoting: buildings, parts of buildings − doors, doorways, entrances or windows −, conveyances (cars, buses, aeroplanes, trains, carriages, and ships); books and publications, where a representation is contained; clothes and parts of a person's outfit, or colour in a transferred sense; human and animal bodies and parts of them, in a concrete or abstract sense; the air, sky, heavens, weather phenomena, the acoustic environment, the luminous environment; physico-geographical complements denoting the earth's crust; valleys; forests, parks, and gardens; streets and lanes; parts and forms of the body of water that covers a large part of the surface of the earth (e.g. *sea, lake, river*) to indicate whole or partial location below the surface; collectives, such as crowds, assemblies, organised groups kept together by common customs, laws, or conditions (e.g. *society, community*), geographical divisions (e.g. *town, world*); parts or components of structures and wholes; mountain chains, mountains and hills; and numerals to denote the larger number of objects among which a smaller number is chosen. Examples (Lindkvist, 1950: 26-52):

Walker was standing in the doorway and instinctively he turned round.
..their women walk a step or two behind them, in native dress...
A servant in scarlet interrupted him...
Halleran mumbled in his throat
The wise traveller travels only in imagination
The night did not darken, for the moon was in the sky..
In a valley in Hoy...lies the celebrated Dwarfie Stone,...
A detailed description of the objects in this collection is unnecessary.
The highest hill in this chain is Scallafield, 921 feet.
Scarcely one in a hundred of the old apple trees now remained.

b) *Enclosure within a surface, expanse or area.*

The object is enclosed by the outer bounds of the surface, expanse or area. Pure surfaces exist in two dimensions only, whereas expanses and geographical areas may add the third dimension (height). In this sense, *in* is used with complements denoting: writings, pictures, maps, pages, mirrors); parts of human and animal bodies; geographical areas – the earth as a planet and other heavenly bodies; stretches of the surface of the earth, such as *ground, land, country, plain, field, meadow, desert, wilderness*; islands and peninsulas; territories, countries, continents, provinces, etc.; cities, towns, boroughs, suburbs, villages; parts and quarters of towns, squares, market-places, yards and courts; roads and paths; seas and oceans, as large areas defined by the land, places and spots. Examples (Lindkvist, 1950: 55-74):

> *His fruit pieces reminded you of the fruit in a picture by Ghirlandajo.*
> *London is the largest and richest city in the world*
> *...there is a cottage in the grounds with 4 rooms and hot and cold water...*
> *Species rare or absent in Ireland are often scarce or wanting in Man.*
> *His character among all the communities in the province stood high.*

c) *The qualities or nature of an object*

The function of *in* is purely formal, namely to connect the object with the quality, behaviour nature or form that is observed in or assigned to the object. The expression may convey: qualities in general, external or internal; qualities to set a person's behaviour in relation to his personality, character, conditions, position in life, etc., or to common ethical standards. After the verbs *be, reside, rest*, and *lie* to indicate the person or thing in whose control something is or on whom something depends; nature and form, to indicate that the two nouns really denote the same object, but seen from different points of view . Examples (Lindkvist, 1950: 75-88):

> *He was deaf in one ear.*
> *...the coat , which he had always thought to be rather too long in the sleeves.*
> *... five distinct styles of architecture in the building.*
> *...a small increase in first and second class fares,...*

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... poetic richness (so astonishing in one who works in the medium of a foreign language)...

...Now is the Son of Man glorified, and God is glorified in him.

... England had a new King in William of Orange.

... a large fleshy face, clean shaven, with the cheeks hanging on each side in great dew-laps.

d) *Location within or along a line*

In indicates position or motion within a line to indicate that something fills up a line in its whole extent, or the line is imaginary and used for the determination of a distance, or used for indicating that certain phenomena coincide on a given line; lines in a transferred sense (*direction, course, route, orbit, track, path*, and *way*) to indicate the line of movement. Examples (Lindkvist, 1950: 89-91):

We observe a planet wandering round the sun in an elliptic orbit.

Position along a line, with complements denoting streets, roads, squares, and other open spaces in towns, to indicate that something is situated on their sides. Example:

It was a one-room cottage in what was called Town Lane. (Lindkvist, 1950: 93)

e) *Relative position.*

In is used to define the position of an object in relation to another object by indicating: relation in respect to quarter or side with the complements: *foreground, front, midst, middle, centre, heart, flank, rear, end, background*, and *bottom*; the points of the compass; and the general terms *direction* and *quarter*; relation of remoteness with the terms *latitude* and *longitude*; with measures of length defined by numerals or the like; with the terms *nearness, neighbourhood, vicinity, proximity* and *reach, distance.* Examples (Lindkvist, 1950: 95-100):

...what was that violet splodge right in the picture's middle?

The wind is in the S.W.

Shetland is entirely insular, and surrounded by ocean currents considerably warmer
than those of other places in the same lattitude.
Old Ford Road, to the north of the Museum, leads in half a mile to Victoria Park.
Arundel Castle rose in the distance like a huge grey rock....

f) *Enclosure within a body, surface or area thought of as being used to serve a purpose.*

An object, structure, place, area, institution, circle of people, or a specific part of any of these, is used to serve a certain purpose either by having a definite function or by being the centre of an activity peculiar to it. *In* is used with complements denoting: human habitations, buildings, or parts of them; places as centres of activities characteristic of them; private or public assemblies and groups of people forming collective units with definite tasks and functions − legislative, administrative, judicial, military, commercial, etc.; places of employment and work, or a collective of which somebody is a working or otherwise active member; means of conveyance; means of communication; supporting objects (bed, chair); covering objects; drinking vessels, and eating utensils. Examples (Lindkvist, 1950: 101-114):

We had been spending a night away in an old Border mansion.
...most of the cotton used in the English mills came from the Southern States.
Perhaps you are married, and your husband is in the Forces.
He slept sitting uncomfortably in his chair at the desk.
1837: ...drink his health in a glass of hot brandy-and-water..

g) *Motion and direction to the interior of a body or surface.*

The verb (or another governing phrase) expresses motion, and the preposition indicates the ending-point of that movement. This is the case with the neutral transport-verbs *place, put* and *set*; verbs which denote a movement to the interior of an object, such as those compounded with the prefix *in-* (*include, insert, etc), merge, stick, confine, shut, lock, hide, conceal, pack, stow, wrap, dress, seize, catch, take, write,* etc.); verbs denoting a movement downwards (*fall, lay, deposit, sow, plant, dig, bury, sink, dive, plunge, souse, duck, immerse, sit, seat, settle*, etc.); verbs which indicate an act of reaching (*arrive, land, appear, turn up, emerge, disappear*, etc.), verbs denoting a mostly vertical movement which ends in contact

(often violent) with a plane surface that is not affected structurally; verbs of looking and staring (towards the interior of an object) to indicate that one is searching for something which is to be found inside the object. *In* is used with complements denoting: a human or animal body, or part of it, to indicate that it is exposed to some sort of contact, often so as to be affected structurally; the human face or parts of it without implying physical contact; the ear, after verbs like *speak*, *murmur, whisper, shout*, etc. Examples (Lindkvist, 1950: 116-127):

> *The young oysters are brought from Holland and laid down in the river to fatten.*
> *... before he arrived in Heidelberg, he stayed for a few weeks in Cologne,...*
> *She pursed her lips when she looked in the glass.*
> *I was stabbed once in the arm and once in the cheek.*
> *Raising his head a little he looked the Cahirman very straight in the eyes.*
> *...a courteous but earnest voice speaking in his ear added to his alertness.*

4.1.2 Comment

The author recurrently reminds the reader of a core central sense for each preposition.For *at*, the complement is "apprehended as a point". For *on* the concepts of *surface* and *support* are recurrently used, while for *in enclosure* is the central notion. Lindkvist does not explain why all three units may be used with objects "for a certain purpose", or what the difference between them in these uses may be. Likewise he does not explain differences between *at* and *on* to express direction of movement, or between *in* and *on* to express location in areas.

Lindkvist has been criticised for lack of systematicity (Bennett, 1975; Hawkins, 1984; Herskovits, 1986; Cienki, 1989), but this is not the only shortcoming of his work. We should acknowledge the usefulness of his analysis in the sense that it presents a large amount of material. While accepting its lack of systematicity, I would make some remarks on his work:

a) To make a list of contexts and their meanings is not tantamount to explaining the meaning of a single word that occurs in those contexts.
b) We need to explain why these contexts appear, and not others, i.e. the motivation of these uses.

c) We should produce a scheme that explains the relationship between the different uses observed for a particular unit, and can explain the motivation of new ones.

d) We need to explain why the three units are acceptable for certain contexts, e.g. 'person at/on/in place of employment', and what semantic difference there may be between them in those contexts.

4.2   The componential approach

4.2.1   D. C. Bennett

Bennett (1972, 1975) applies the structuralist principle of markedness whereby each preposition is positively marked or simply unmarked for certain designated components of meaning. He distinguishes a series of semantic primitive features. Each preposition is assigned a *core meaning* defined by one or more of these features. He bases his analysis on three components:

a) Case Grammar: Five cases are taken into account, as elements occurring in the *underlying representations* of sentences: *'locative', 'source', 'path', 'goal'*, and *'extent'*. The basic sense of each preposition has just one of these cases, though it can express two or three of them, depending on the context.

b) Componential analysis: The author distinguishes the following semantic features: *Anterior, posterior, higher, lower, exterior, interior, proximity, transverse, length*, and *surround*.

c) The general notion of location that has its origins in Jakobson's *Gesamtbedeutung* (the general meaning that a term has in isolation), which is characterised for each preposition as a combination of case and semantic feature.

Bennett does not distinguish between spatial or temporal meanings but a 'general sense' is posited which is not specifically spatial or temporal (Bennett, 1975: 11). In order to find this

general meaning he distinguishes locative, directional and extent contexts, and analyses the prepositions in each of them. He suggests that unmarked senses are those with the simplest *underlying representations*, while marked uses have complex underlying representations. General meanings are those senses which are not determined by context, i.e. whose components are always present whenever they are used. So, for the preposition *by* we find the following occurrences: (1) *My car is by the post office*. (2) *I took this chair from by the window*. (3) *We drove by the post office*. (4) *I've put the book by the telephone*. LOCATIVE, SOURCE, PATH and GOAL uses are illustrated in these examples. In (2), the preposition *from* determines the SOURCE sense. In (3), the verb *drove* determines the PATH sense, and in (4), the verb *put* determines the GOAL sense. In (3) and (4), the general meaning of the preposition *by* is *locative proximity*, because we could paraphrase them as W*e drove on a path located by the post office*, and *I put the book on a goal located by the telephone*. However, in (1) we do not need to paraphrase, according to Bennett: *My car is by the post office*. This indicates that *locative proximity* is the simplest *underlying representation* possible, and the others are complex and marked for this preposition.

Bennett claims that *at*, *on* and *in* do not add any meaning in the realisation of path expressions, but only in simple locative expressions. In dynamic contexts, the Path meaning would be carried by other elements in the sentence. He proposes the following componential definitions as *general meanings* (1975: 67):

at: 'locative'
on: 'locative surface'
in: 'locative interior'

Bennett's motivation for such *core senses* is simplicity and economy in grammar and lexicon.

4.2.2   Comment

On the one hand, the label *locative* for the meaning of *at* is so general that it does not mean anything at all, since many other prepositions are also characterised as locative. On the other hand, the author claims that *general meanings* are independent of context, which is an

untenable assumption since no morpheme occurs in isolation of context at any time. In addition, we could also paraphrase his sentence for the general meaning of *by* as *My car is at a place located by the post office*, in a parallel way to the rest of contexts. Bennett defines the meaning of these expressions when they refer to the physical domain in stative contexts, which he calls *locative*. Dynamic and metaphorical uses are excluded from the analysis. For this reason, a set of topological features may seem sufficient to describe these meanings.

4.3   The geometric/topological approach

4.3.1   G. Leech

Leech (1969: 161-163) offers an analysis of *at*, *on* and *in* based on a structuralist perspective of geometric descriptions. He uses topological features: contiguity and inclusion. He describes only stative uses, and does not consider separate meanings for the dynamic uses, since he sees this difference as determined by context. According to Leech, a construction of the type *A Prep. B* ascribes B a certain dimensionality. Interestingly, he discards the point configuration for the complement of *at*. He describes the relation *x at y* as *x* being contiguous or juxtaposed to the place of *y*, where the dimensionality of *y* is not significant. The relation *x on y* is described as *x* being contiguous with the place of *y*, where *y* is conceived of either as one-dimensional (a line) or as two dimensional (a surface), in his terms PLA[1DIM], PLA[2DIM]. Finally, the relation *x in y* holds if *x* is enclosed or contained either in a two dimensional or in a three dimensional place *y,* in his terms PLA[2DIM], PLA[3DIM].

4.3.2   A. Herskovits

Herskovits (1985, 1986) provides a detailed version of the geometric approach of previous more schematic descriptions (Leech, 1969; Quirk et alii, 1985). This author proposes *ideal meanings* ("irreducible ideal associated with a preposition") from which usage may deviate according to pragmatic tolerance or linguistic convention that leads to polysemy. She therefore distinguishes a series of *use types* for each preposition, based on convention, which

she calls *sense shifts*. Her *ideal meanings* are based on geometric descriptions of the *located entity* and the *reference entity,* that is, geometric relations that apply to various geometric figures (points, lines, surfaces, volumes) associated with the objects. They are "unitary models that exist in people's minds and allow them to understand novel use types".

4.3.2.1 *At*

The *ideal meaning* proposed for *at* is the following (Herskovits, 1986: 128):

> *at: for a point to coincide with another*

A more formal version is given elsewhere (Herskovits, 1985: 351):

> *At (x,y) iff coincides (x,y) (where x and y are points)*

According to Herskovits, an expression with *at* asserts that two points, each specified by a different description, overlap in space, the first being typically mapped onto an object, and the second onto a fixed earth location. The various *use types* listed below are seen as deviations from this ideal:

a) *Spatial entity at location*: It involves an object or event "on, in or very close to another object which defines a location. The two objects are conceptualized as coincident points" (Herskovits, 1986: 128). Possible locations include entities denoted by the words, *place, spot, location*, etc., geographical locations, or geometrical points. Examples (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*

b) *Spatial entity "at sea"* : We find this use in examples like the following (Herskovits, 1986: 133): *The Titanic will never be at sea again; The marijuana containers are already at sea.*

c) *Spatial entity at generic place*: In the context of leisure activities. Examples (Herskovits, 1986 13): *He likes to spend his vacations at the seaside.; She owns a cabin at the mountains.*

d) *Person at institution*: It implies a person's formal affiliation with an institution usually associated with a location, and "such affiliations mean that people are frequently at that location" (Herskovits, 1986: 134). Examples (Herskovits, 1986: 134): *Several hundred workers at the cannery are on strike; My son is at the University.*

e) *Person using artifact*: The two objects are closely associated with each other and their dimensions are irrelevant. Example (Herskovits, 1986: 135): *Maggie is at her desk.* Herskovits admits that *Maggie,* in this example, is understood as using or interacting with the desk, but she attributes this interpretation to a pragmatic inference, not to the meaning of the locative.

f) *Spatial entity at landmark in highlighted medium*: The author defines medium for an object as "a region of space which contains it and is conceptualized as being of greater dimensionality than the object". Example (Herskovits, 1986: 137): *The bus is at the 3rd street stop.*

g) *Physical object on a line and indexically defined crosspath*: Examples (Herskovits, 1986: 138): *The gas station is at the freeway; There is a campsite at the river.* Herskovits explains that, in the examples, the *campsite* and the *gas station* are at the intersection of some indexically defined crosspath with the river and the freeway.

h) *Physical object at a distance from point, line or plane*: Examples (Herskovits, 1986: 139): *The first rest stop is at a distance of three miles.*

4.3.2.2 *On*

The proposal for an *ideal meaning* of *on* is as follows (Herskovits, 1986: 140):

> on: for a geometrical construct X to be contiguous with a line or surface Y, if Y is the
> surface of an object O_Y, and X is the space occupied by another object O_X, for O_Y to
> support O_X.

The *use types* are the following:

a) *Spatial entity supported by a physical object*: The *located object* rests on a free surface of the *reference object*; this need not be a top nor a horizontal surface, though almost always is an outer surface, and may support only part of the *located object*. This may also hang, adhere, be joined by nails, screws, etc., be a part of. The *reference object* cannot be a point or line. Examples (Herskovits, 1986: 140-141): *the ladder on the wall; the laundry on the line; the lamp on the ceiling; the ring on his finger; the characters on the page*.

b) *Accident/object part of a physical object*: The located object constitutes a separate relief, as if it were stuck. Example: *the carving on the stone* (Herskovits, 1986: 143)

c) *Physical object attached to another*: There may or may not be support. Examples (Herskovits, 1986: 144): *the pears on the branch; a dog on a leash.*

d) *Physical object transported by a large vehicle*: Although "containment is salient". Example: *the children on the bus* (Herskovits, 1986: 144).

e) *Physical object contiguous with another*. Example: *the lock on his forehead* (Herskovits, 1986: 144).

f) *Physical object contiguous with a wall*. Example*: On the left wall, there is a chest of drawers.* (Herskovits, 1986: 145).

g) *Physical object on part of itself*. A part of a resting object is contiguous to the supporting surface.Example: *the man on his back* (Herskovits, 1986: 146).

h) *Physical object over another*. There is neither support nor contiguity. Example: *the clouds on the island* (Herskovits, 1986: 146).

i) *Spatial entity located on geographical location.* With geographical locations *on* is used "to indicate that an object or an event is located in them". Example: *the players on the football field* (Herskovits, 1986: 147).

j) *Physical or geometrical object contiguous with a line.* Example (Herskovits, 1986: 147): *a village on the border; the sun on the horizon.*

k) *Physical object contiguous with edge of geographical area.* On is used with open spaces, bodies of water, and pathways. Examples (Herskovits, 1986: 148): *a shop on the main square; a garden on the lake; the gas station on the free way.*

4.3.2.3 *In*

Herskovits proposes the following ideal meaning for in:

> in: inclusion of a geometric construct in a one-, two-, or three-dimensional geometric
> construct.

The use types are the following:

a) *Spatial entity in container*: A three-dimensional object has an interior − defined by a concavity, two planes, or lines −, where another is partially or fully contained. Examples (Herskovits, 1986: 149-150): *the preserves in the sealed jar; the milk in the glass; hands in the pocket; the chair in the corner; the finger in the ring; the man in the doorway.*

b) *Gap/object 'embedded' in physical object.* It also applies to surfaces, as very thin laminae. Examples (Herskovits, 1986: 150-151): *the crack in the surface; the hole in the wall*;

c) *Physical object 'in the air'.* An object is entirely surrounded by air, and/or raised high from its typical position. Examples (Herskovits, 1986: 151):   *the bird in the air; He raised his glass in the air.*

d) *Physical object in outline of another, or of a group of objects*. Examples (Herskovits, 1986: 152): *the bird in the tree; the squirrel in the grass.*

e) *Spatial entity in part of space or environment*: This is unbounded or has vaguely defined boundaries. Examples (Herskovits, 1986: 152): *There is a chair in the middle of the room.; They sat in the shadow of a tree.*

f) *Accident/object part of the physical or geometric object*: The reference may be a group of solid objects. Examples (Herskovits, 1986: 152-153): *the muscles in his legs; the crease in his pants; a sharp angle in the edge of the cliff; a man in the crowd.*

g) *Person in clothing*: In this case surrounding is not required, but "it is at the root of this use". Example (Herskovits, 1986: 153): *a man in a red hat.*

h) *Spatial entity in area*. It is adequate in geometry, divisions of a page, and geography. Examples (Herskovits, 1986: 153): *in the circle; in the margin; in the field.*

i) *Physical object in a roadway*. Example (Herskovits, 1986: 154): *There is a truck in the road.*

j) *Person in institution*. The person is in the institution in a typical function associated with it. Examples (Herskovits, 1986: 154): *the man in jail; The children are in school.*

k) *Participant in institution*: The person need not be physically in the building. Example: *My son is in college* (Herskovits, 1986: 155).

4.3.3   Comment

There is circularity in Herskovits's definitions for the *use types*. All the *use types* for *at*, and *in* (but one) are defined as *N at N*, and *N in N*, respectively, so that she repeats the linguistic expression she is trying to account for. In the case of *on*, in some cases the definition includes other prepositions, as in 'Physical object over another', where the author does not explain

why *on* instead of *over* should be used. Circularity of descriptions is also apparent: *At* is defined as having a *reference object* configured as a point, *on* as a surface or line, and *in* as a volume or area. Examples with *at* are, then, explained as having the *reference object* seen as a point, those with *on* as having the *reference object* seen as a surface of support, etc., but no reason is given why a particular configuration and not any other should apply. The only reason seems to be the use of the corresponding preposition. Surprisingly, in the case of 'Physical object on geographical area' the description asserts that the object is located *in* (my emphasis)the area, but again it is not explained why *on* instead of *in* is used.

When two prepositions are possible in the same context, the author explains the preference of one over the other by saying that the geometric configuration is a point, for *at*, a surface of support, for *on*, and a volume or container, for *in*, but the question arises why speakers decide in favour of one or the other in each case. She answers that salience of one or the other geometric configuration is the reason, but judgements on the salience or lack of salience of a particular geometric description are made on a personal basis, without providing any context. However, introspection as a methodology seems to be of little use, especially when guided by limited criteria, such as the assumption that geometric descriptions should be enough for describing spatial meanings. Furthermore, Herskovits only analyses very limited contexts, such as expressions that fit the syntactic environment Np + P + NP, with no further context, which does not provide sufficient evidence for deciding on salience. Finally, although she speaks of polysemy, in fact Herskovits's claim is that the *ideal meaning* is present in all *use types*. She thus ends up in a posture similar to previous *core sense* approaches.

4.4   The Procedural Semantics topological approach

4.4.1   G. Miller & P. Johnson-Laird

Miller & Johnson-Laird (1976) point out the necessity of treating language according to the same principles of perception, learning, and motivation that are believed to govern all thought and behaviour. They criticise the associationist view of language by introducing the idea of

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judgement in the process of perception itself. It is the outcome of attentional-judgemental abstractions from perception, not the particular percept itself, that provides a basis for learning labels (speakers' perceptions filter the relation between world and language). They criticise verifiability theories of meaning, because they are not psychological, but logical (verification as basic operation). They propose *procedural semantics* where a small set of control instructions, each representing a complex skill (search, management of attention, recognition, memory management, etc.) for attention-judgement of perceptual predicates is acquired in the course of cognitive development. A lexical concept has a *definitional part* which consists of a schema for recognising instances plus a *connotative part*, i.e. knowledge associated with that concept, including the relation to other concepts.

In their treatment of spatial relations (Miller and Johnson-Laird, 1976: 375ff.), these authors admit the syntactic variability of the use of *at*, *on* and *in*, and claim that the grammar of these morphemes is too complicated to justify calling them simply prepositions. On the other hand, to assign them to various syntactic categories suggests diversity where there is semantic uniformity. Taking this into account, the authors restrict their analysis to the construction *NP + (P + NP)*, where they see locatives basically as "a relation taking an ordered pair of arguments: $R(x,y)$". Here the *referent x* is a target identified by the head noun phrase, the *relatum y* is a landmark identified by the object noun phrase, and R is a spatial relation indicated by the preposition. Previous to semantic description, a distinction between *absolute* and *relativistic space* is made. The former refers to "the Newtonian conception of space as an infinite continuous, stationary, three-dimensional box", which serves as a referential frame for concepts such as north, south, east or west. On the other hand, the relativistic conception of space requires a different linguistic treatment, since it is more natural and primitive, and offers "a frame for concepts like front, back, right, left, etc. which is always relative to the organism that provides a perspective". According to this idea, the conception of *at* as adapting point locations is seen by these authors as the result of applying *absolute space* and not *relativistic space*, which results in a partial explanation of its meaning. For a complete account of spatial meanings the authors suggest that two *search domains* must be distinguished, the one in which to search for the *relatum y* and a subdomain of the first in which to search for the *referent x*.

4.4.1.1 *At*

Miller and Johnson-Laird note the indeterminacy of *at* with respect to the configuration of its *relatum*. Leech (1969) used the term *contiguous* or *juxtaposed* to define the *at* relation, but these authors claim that contiguity or juxtaposition is not necessary for this relation. They use the concept of *region* to determine the *at* relation. For them, to say '*x at y*' implies that *x* is included in the region of *y*, i.e. "where *x* can interact with *y* socially, physically, or in whatever way *x's* conventionally interact with *y's*". The absolute *at* need not be absolutely precise, but may designate a region around the value given for the *relatum*, which is not an object. Therefore, the abstract character of the *relatum* distinguishes absolute from relative designations. Thus, *at 13.000 feet*, or *at 0 degrees longitude* are absolute designations. For relativistic designations with *at*, judgements involving the *region* of an object combine perceptual with functional information about the use of that object:

> if some class of human artifacts is totally unfamiliar to a person, if they stir in him no meaningful expectations of what they do or what is to be done with them, he will hardly have any clear perception of a characteristic region of interaction with them. Common sense would decree that the judgement could only be made on the basis of a firm conception of what kind of thing *y* is. Given such a concept of *y*, the way one characteristically interacts with it (if such a way exists) would surely be a part of that concept, ... (Miller and Johnson-Laird, 1976: 388)

Their proposal for a schema of *at* is the following:

> AT(*x,y*): A referent *x* is at a relatum *y* if:
> (i) INCL (*x*, REGION (*y*))

It is implicit that the *referent* must not be too large to be included in the *region* of the *relatum*. *Relata* should be less mobile and larger or more salient than the *referents* they locate. But small objects can serve if they are perceptually salient. The term INCL in the schema implies that the relation is not symmetric, a point specially relevant when *referent* and *relatum* are commensurate in size and mobility. So, the schema is widened with a second assertion:

(ii) not (INCL (*y*, REGION (*x*))

According to this analysis *at* and *with* are contrasting terms, since *with* implies a symmetric relationship as far as *search domains* for *regions* are concerned.

4.4.1.2 *On*

With regard to the locative *on,* these authors remark that it may indicate class membership (*the man on the committee*), connectedness (*the dog on the chain*), a part-whole relation (*the nose on your face*) or movement (*the man on the move*). The *relata* for *on* seem to be surfaces, which suggests that the subdomain should be the region of the surface of the *relatum*, which need not be horizontal. Surfaces are parts of objects and therefore this subdomain is not defined for abstract *relata*. With regard to an example like *the house on the river* the authors say that it is understood as *the house by the river*, and that the ambiguity arises from the nature of paths, which can be thought of either as surfaces along which traffic can pass or as edges marking the boundary of something. Thus as long as you use *on* for surfaces and *by* for edges there is no problem of interpretation, while the use of *on* for edges may be ambiguous if the edges have surfaces. Miller and Johnson-Laird, thus, represent the uses of *on* as:

> ON: (*x*,*y*): A referent *x* is on a relatum *y* if:
> (i) (INCL (*x*, REGION (SURF(*y*))) & SUPRT(*y*,*x*)); otherwise go to (ii)
> (ii) PATH(*y*) & BY (*x*,*y*)

As a first option, then, the *relatum* is to be interpreted as a surface. Otherwise, the authors admit that some *relata* prefer *on* and others prefer *by*.

The authors notice a limitation to the transitivity of the *on* relation. For instance a lamp may be on a table that is on a rug on the floor but we do not describe that situation by saying *the lamp is on the floor*. So, the subdomain of search for *on* must be the region of interaction with the surface of the *relatum* rather than merely the surface itself. Thus, we do not say *the lamp*

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on the floor in that situation, because when we search in the region of the floor, we will not find it, but we find the table, and therefore *the table on the floor* may be said.

4.4.1.3 *In*

These authors acknowledge a variety of uses for *in*, but suggest that underlying all these uses there is a concept that can be represented by making the subdomain of search the *relatum* itself, which implies that the *relatum* itself must be the kind of thing that has an interior to serve as a *search domain*. The meaning of *in*, then, implies locative inclusion (as in *a city in Sweden*), or it may involve containers (as in *the coffee in the cup*) with the complication that something sticking out of a container can still be said to be in it (*the spoon in the cup*), or it may imply that the container need not be always larger than the objects it has in it (*the club in his hand*). It may also involve part-whole relations *(the bone in the leg)* with a contrast between two and three-dimensional objects (with two-dimensional objects the contrast with *on* seems to be a matter of judgement as to how the *referent* goes into the *relatum* (as in *the scratch in the surface*). The following schema is claimed to fit all cases:

IN(x,y): A referent *x* is 'in' a relatum *y* if:
(i) [PART(x,z) & incl(z,y)]

The schema asserts that part of *x* is included in *y*, but leaves uncertain how much of the *referent* must be inside the *relatum*.

4.4.2 Comment

Miller and Johnson-Laird criticise geometric descriptions of locatives, because they reduce their scope to *absolute space*.

With regard to the limited transitivity of *on,* the authors assume that *in* and *at* do not share this lack of transitivity, but in fact they do. If there is *a person at a table* and that table is *at a window*, the person is not necessarily *at the window*, and the same explanation as for *on* holds here. The supposed transitivity of *in* can also be refuted: if there is *a man in a bathtub* and he

is sitting, his head is not *in the bathtub*, or if there are some *flowers in a vase*, and there are *stamens in those flowers*, the stamens are not in the vase, etc. Miller and Johnson-Laird have confused the linguistic meanings, – and I am here referring particularly to *in* – with the topological concepts themselves. Thus, *inclusion* as a topological concept is in fact a transitive relation, so that if A includes B, and B includes C, then A includes C; but the linguistic meaning of the locative *in* seems to resist being reduced to a simple topological relation of inclusion.

The authors mention the functional relationships between *relatum* and *referent*, but only with regard to the meaning of *at,* as the *connotative part* of it. I suggest that this functional relationship should also form part of the schema, not only for *at*, but also for *on* and *in.* This functional part of the meaning will be relevant for deciding between the use of *on*, *in* and *at,* in many contexts where human beings are involved, their activities, relationships, feelings, and in general in all contexts referring to non-physical domains (where topological relations between objects do not hold as clearly as in the physical domain).

In short, this is a good account in topological terms, but the functional configuration and the force-dynamic relationship between *referent* and *relatum* are not taken into account. *Procedural semantics* bases linguistic description on psychological percepts and conceptualisations, as opposed to truth value approaches. Nevertheless, their linguistic analysis only takes into account topological perception as a relevant aspect.

4.5   The Conceptual Semantics preference rules approach

4.5.1   A. Cienki

Cienki points out several inadequacies of *core sense* approaches (Cienki, 1989: 13ff.):

a) The fact that geometric descriptions apply to various geometric figures associated with the objects, and not to the objects themselves.

b) Divergence from simple geometric relations, as when we say *the pear in the bowl*, but in fact that pear is on top of some pieces of fruit, and is actually not in the interior of the bowl.

c) Unexpected dependence on context, as when the situation does not dictate to use *Lucy is at the playground* as opposed to *Lucy is in the playground.*

d) Unexplained restrictions in some cases where the geometric description indicates that an expression should be acceptable and it is not, as in **Draw a line in the blackboard* (where the line is included in the area in question) as opposed to *Draw a line on the blackboard*; *or *the potato in the bowl* as opposed to *the potato under the bowl,* if the bowl is upside down.

e) Inability to handle fuzziness in word meanings, which sometimes leads to alternative use of various linguistic units for the same 'objective' situation.

f) Additional constraints, such as the functional relations that *at* marks in *Maggie is at her desk,* or the canonical position of objects that is presupposed in *There is milk in the bowl.*

Cienki adopts Jackendoff's distinction between *projected world* ("as experienced") and *real world* (Jackendoff, 1983: 26), so that "the information conveyed by language must be about the projected world" (Jackendoff, 1983: 29). Following Jackendoff's framework the author proposes three sorts of conditions for meanings, namely, *necessary, centrality* and *typicality* conditions. He assumes a single level of mental representation, *conceptual structure*, at which linguistic, sensory, and motor information is compatible. The conditions of meaning proposed should therefore be supportable by evidence from perceptual psychology. Consequently, Cienki hypothesises that speakers' choice of prepositions matches perception with semantic conditions in the lexicon. In the framework of *Conceptual Semantics,* lexical entries are assigned a semantic category among the set of universal conceptual categories (Thing, Event, State, Action, Place, Path, Property, and Amount). These categories may be expanded into more complex expressions via formation rules.

With regard to spatial expressions, Cienki asserts that the motivation for their use "stems from a geometric schematization of the spatial elements involved"(Cienki, 1989: 26), which implies that certain aspects of the scene serve to represent the whole The schematic aspects used by this author are the following[36]:

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[36] Cienki analyses the following prepositions of English: on, on(to), in, in(to), at, to, toward(s), in addition to their Russian and Polish counterparts.

a) topological: relations of contact (coincidence or intersection), boundary, or interior

b) geometric: point, line, or   surface

c) physical: relations of support or attachment

d) metric: proximity/ juxtaposition

These aspects combine with semantic conditions according to preference rules that define prototypical senses, in terms of *necessary, centrality,* and *typicality* conditions. The preference rules proposed by Cienki for *at*, *on* and *in* are the following[37]:

a) Preference options for *at*: The *Localiser* is conceived as a point and the *Spatial Entity* coincides with the place where it is located, and this is a central *use type* of this preposition. In the second *use type*, the *Spatial Entity* is functionally oriented towards the *Localiser*, which is an object of activity, and this is a typical as well as central *use type*.

at:

$$
\begin{bmatrix}
\text{at} \\
\begin{bmatrix}
\text{SpE COINCIDENT WITH PLACE OF L-r -POINT (Cent)} \\
\text{SpE FUNCTIONALLY ORIENTED TOWARD L-r -OBJECT OF ACTIVITY (Typ) (Cent)}
\end{bmatrix} \\
\begin{bmatrix}
\{\text{POINT}\} \\
\{(\text{BOUNDARY or CONTAINER})\} \\
\text{Pref } \{[\text{Place AT ([Thing } \{(\text{BOUNDARY or CONTAINER}) - \text{OBJECT OF ACTIVITY}\} \text{ D }]\} \\
\{[\text{ Path TO (} \hspace{8cm})]\}
\end{bmatrix}
\end{bmatrix}
$$
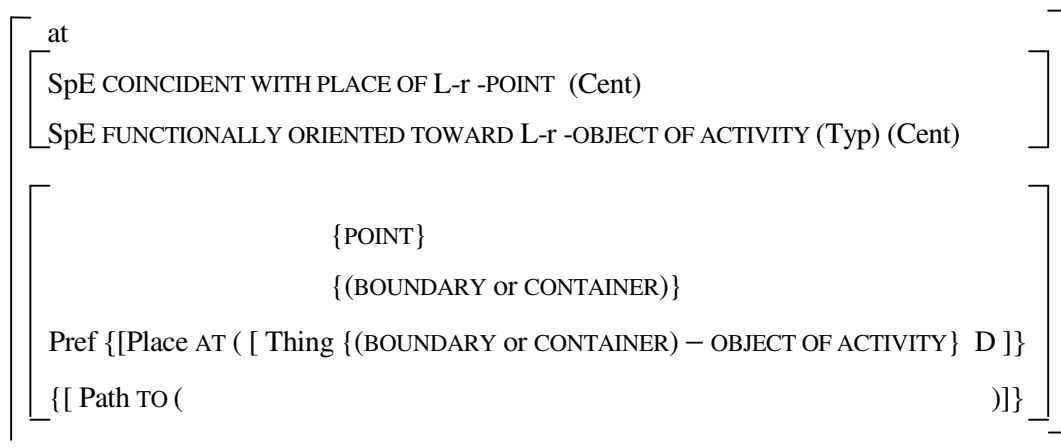
Preference options for *at*: (Cienki, 1989: 152):

The lower box indicates that there are two possible mutually exclusive argument structures for expressions with *at*, namely, a Place argument structure, which is the preferred one, or a Path argument structure, an Adlative Path type. The *Localiser* may be conceptualised as

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[37] In Cienki's terminology Spatial Entity (SpE) denotes the trajector, and Localiser (L-r) denotes the Landmark of the prepositional construction. Curly brackets represent mutually exclusive conceptualisations. Semantic conditions are summarised between brackets. Thing is understood in the broadest sense, including, animate as well as inanimate objects, concrete as well as abstract things.

resisting being apprehended as a point, so that it may conserve a container or boundary condition, since the *Spatial Entity* is seen to coincide with the Place at which the Thing is (which includes the surrounding area), not the Thing itself. This may imply a relation of proximity instead of coincidence. In the case of objects of activity, only boundary or container configurations are possible. Finally, the Path argument structure takes *localisers* as points, and allows for human beings as *localisers*, because they are seen as targets, and are consequently apprehended as points.

b) Preference options for *on*: Both CONTACT WITH BOUNDARY and SUPPORT are typicality conditions, while neither of them is necessary for the applicability of *on*. The emphasis may shift to one or the other component of meaning depending on the situation. Cienki does not include as a condition that the surface of the *Localiser* should be the uppermost one, or even a horizontal one. ATTACHMENT is a typicality condition that depends on the contact condition, i.e. it is only possible if the latter applies. The argument structure may be a Place (preferred) or a Path (Adlative) structure, these two being mutually exclusive. The *Localiser* may be conceptualised as a supporting surface, a surface, a line, or a large vehicle (*on-the-bus* type). Preference options for *on* (Cienki, 1989: 150):

on:

```
⌐                                                                    ⌐
  on
  ⌐                                                          ⌐
    SpE CONTACT WITH BOUNDARY OF L-r (Typ)
            ⇒ ATTACHMENT (Dependent typ)
    L-r SUPPORT SpE (Typ)
  ⌊                                                          ⌋
  ⌐                                                          ⌐
                              {SUPPORTING SURFACE}
                              {SURFACE}
                              {LINE}
    Pref{[Place ON ([Thing {LARGE VEHICLE}          D]}
    {Path TO (                                       )]}
  ⌊                                                          ⌋
⌊                                                                    ⌋
```
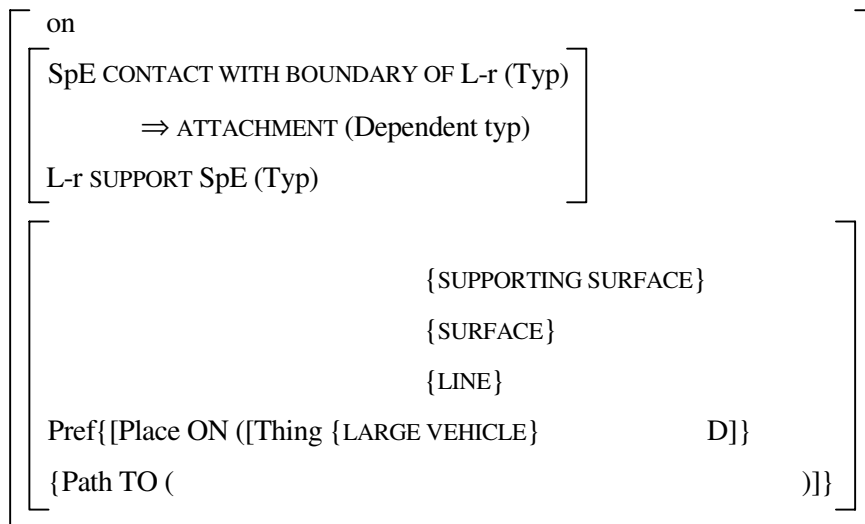
c) Preference options for in (Cienki, 1989: 151):

in:

$$\begin{bmatrix} \text{in} \\ [\text{SpE INTERSECT INTERIOR OF L-r (Nec)}] \\ \begin{bmatrix} \text{Pref}\{[\text{Place IN}([\text{Thing}\{\text{CONTAINER}\} & \begin{matrix} \{\text{CLOTHING}\} \\ \{\text{INSTITUTION}\} \\ \{\text{FILLED SOLID}\} \\ D]\} \end{matrix} \\ \{[\text{Path TO (} &)]\} \end{bmatrix} \end{bmatrix}$$
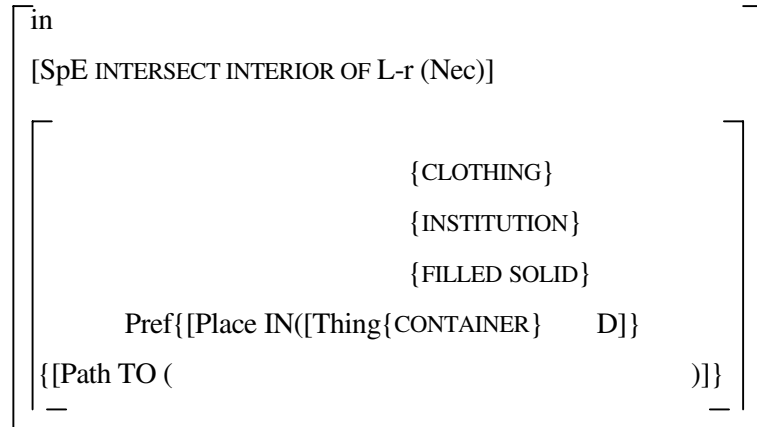
It is a necessary condition that the *Spatial Entity* and the *Localiser* share a common set of points in the interior of the *Localiser*. This may be configured as a container, as a filled solid, as an institution, or as articles of clothing (in the last two, the SpE is a human being). Again either a Place or a Path argument structure is possible.

4.5.2   Comment

Cienki distinguishes a series of *use types*, but he is much influenced by Herskovits's classification, and his description criteria coincide with hers. Cienki calls 'schematisation' the fact of conceptualising objects as points, surfaces or areas. The difference between these two authors resides in the organisation of their taxonomies. Thus, for *at* the central condition is geometric (point apprehensibility) or functional (object of activity), for *on* the parameters used are topological (contact), and physical (support and attachment), and finally, for *in* the criterion is again topological (interior).

The only explanation he gives for cases where only one preposition is acceptable, if more than one might be expected, is that it is a matter of convention or 'frozen' categorisation. Consequently, he does not explain unexpected dependence on context or unexplained restrictions. Neither is the alternative use of various linguistic units for the same 'objective' situation explained, or if it is, it is only in terms of the centrality conditions postulated.

Additional constraints, such as the functional relations or the canonical position of objects are also overlooked. The links between functional and geometric, physical, or topological aspects are also lacking from his explanations.

One of Cienki's differences with respect to previous accounts resides in the ascription of semantics to the *projected world* instead of the real world. He abandons the *core sense* approach, and adopts a perspective based on prototypes that are formed according to preference rule systems defined by semantic conditions. The flaw in the framework is the lack of motivational links between the preference options of a single unit, i.e. why do *point* and *object of activity* share centrality in the meaning of *at*?, and why are *contact* and *support* the typical conditions for *on*? Why these and not others, for instance *surface*? or, why only these ones? The description of *in* assumes that just one necessary condition is enough for all its uses, and omits any functional or interactional aspects.

Another step forward in the description of these predicates is the incorporation of the Path argument structure as an option. However, this option does not change the meaning conditions established for the Place argument structure. Thus, with respect to the adlative *at*:

> This usage does seem to reflect the point-apprehensibility of the L-r that is required for at in the Loc sense. The motion involved is on a path to the L-r as a whole (as a point), and the resultant impression is of motion about to overwhelm the L-r as target. (Cienki, 1989: 149).

Thus, the target sense is subsumed by the point sense, which remains untouched.

4.6 The Cognitive Semantics image-schemas approach

4.6.1 B. Hawkins

It is in Hawkins (1984) that we first encounter the image-schematic approach to the semantics of *at, on*, and *in*. Hawkins criticises the 'core sense' approach for prepositional polysemy and proposes the prototype model of category structure that entails a conception of the lexicon as an encyclopaedia rather than a dictionary. Prepositional meanings are analysed as stative relations between two (or more) configurations in physical space, as perceived by language users. He proposes a descriptive inventory of tools which includes:

a) Basic spatial relations (SEPARATION and COINCIDENCE).

b) Two distinct sets of spatial configurations (nine attributable to the trajector of the relation, and distinguished from each other on the basis of topological and geometric properties: *terminative path, initiative path, perfective path, imperfective path, circuitive path, nonrectilinear path, area, space,*and *indeterminate;* and four to the landmark: *medium, surface, channel, indeterminate*).

4.6.1.1 *At*

The semantic structure of *at* is represented as instantiating two main basic schemas as prototypical ones (Hawkins, 1984: 372):

AT: a) He sat at the roll-top desk.
     b) the solar observatory at Mt. Wilson.


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TR    ∞      LM


PHYSICAL SPACE
```
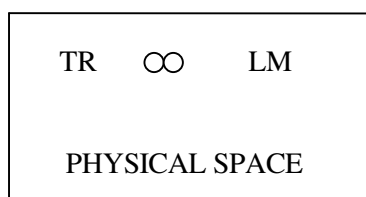
AT: a) Buck rushed at the splintering wood.

b) They poked sticks at him.
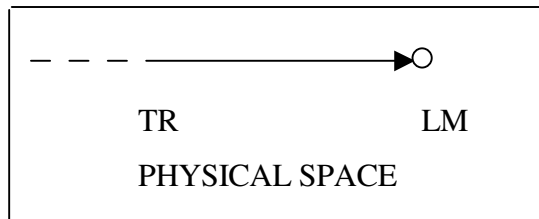
The first schema represents a spatial relation of COINCIDENCE, which means that some part of the trajector configuration coincides with some part of the landmark configuration. Both the trajector and the landmark have an *indeterminate* configuration, which implies that they fail to have any significant extension in any dimension, i.e. both have zero-dimensional significant extension. The meaning of *at* is therefore reduced to the topological relation of COINCIDENCE.

In the second schema the trajector has a *terminative path*. This configuration highlights the specific nature of the path traversed in the locomotion process, so that the PP facilitates specification of the end-point of the path, as specified by the landmark. The origin of the path remains unspecified. The landmark has again an indeterminate configuration, and the relation between trajector and landmark is one of COINCIDENCE. Hawkins does not develop the semantics of *at* any further, so that we cannot appreciate its polysemy. The landmark configuration is conceived of as *indeterminate*.

4.6.1.2 *On*

The semantic structure of *on* also instantiates two schemas (Hawkins, 1984: 380):

ON: a) There were some precious pots on the shelf.
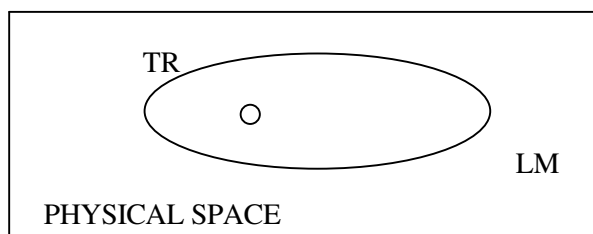
ON: a) The dried bricks were loaded on the donkey cart.
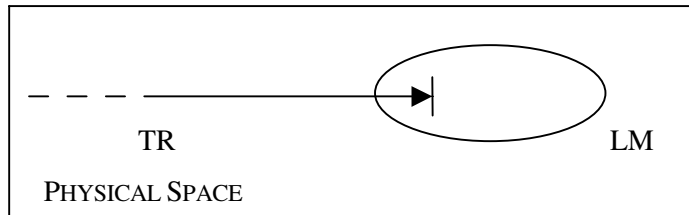
The first schema represents a spatial relation of COINCIDENCE. The trajector configuration is again *indeterminate*, as for *at*, but the landmark configuration is, in this case, a *surface* configuration, which means that the landmark is conceived of as a two- or one-dimensional entity. The second schema adds the *terminative path* configuration for the trajector.

4.6.1.3 *In*

The schemas produced for the representation of the semantic structure of *in* are as follows (Hawkins, 1984: 377):

IN: a) Barry was making a fool of himself in the kitchen.
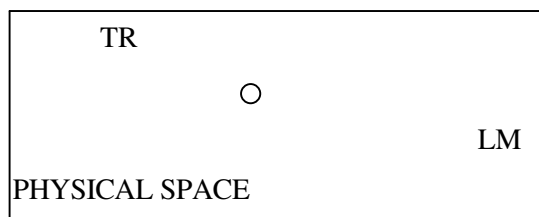
IN: a) Boy did I get in that house fast.
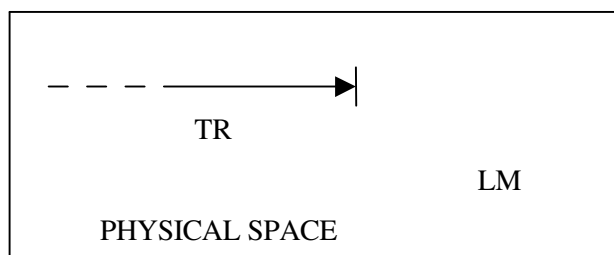
Both schemas instantiate a relation of COINCIDENCE. The second one adds the *terminative path* configuration for the trajector, which specifies that the coincidence is of the end-point of the path with the landmark. The landmark configuration specifies a MEDIUM, which means the landmark is conceived of as a three-dimensional or two-dimensional entity that involves a potential interior or containment relation. The dotted lines indicate that the existence of a boundary in the landmark is not necessary.

4.6.2   Comment

Image schemas represent geometric and topological features, so that Hawkins does not get rid of geometry in linguistic description. His family resemblances, as he describes the polysemy of the preposition *around* (Hawkins, 1984: 238-55) are also based on topological features like *path, separation* or *coincidence*. In his description of the category MEDIUM (Hawkins, 1988), he posits a prototypical category MEDIUM as a bounded region of three dimensions, which extends into less prototypical UNBOUNDED 3 DIM, which in turn extends into BOUNDED 2 DIM. The problem with this description is why bounded two-dimensional entities should be considered as MEDIUM instead of SURFACE in examples like *the point in the circle*. On the other hand, if BOUNDED 3 DIM is the prototype, and prototypes of diverse natural categories differ maximally in their attributes, why then UNBOUNDED 3 DIM does not contrast with BOUNDED 2 DIM, as belonging to different categories? In spite of these inadequacies, Hawkins's proposal is a step forward in the representation of semantic structure as image schematic structure. This view contrasts with the conception of mental representations as having propositional structure, which had prevailed in previous descriptions of *at, on* and *in*.

4.7   The Cognitive-functional approach

4.7.1   C. Vandeloise

Vandeloise (1991, 1994) claims that geometric or topological approaches do not base their descriptions on data, but that conversely, the theory in each case determines the interpretation

of data. He argues that that the shape of objects is not enough to explain prepositional use. He adduces data from psycholinguistic studies on language acquisition, which show that meanings which are complex from a geometric or topological perspective (IN) are acquired by children before simple meanings (AT).

Vandeloise does not describe the English predicates *AT* and *ON*, but analyses their French counterparts *À* and *SUR* (Vandeloise, 1991). The details cannot be extrapolated to English, but some generalisations may be useful in understanding certain aspects of the English meanings. Two rules that guide the use of *à* are proposed (Vandeloise, 1991: 157):

A_1: *x est à y* if *y* localizes *x*

A_2: *x est à y* if the positions of *x* are associated in a routine evoked by *y*

These rules exclude coincidence as a semantic feature for *à*, since this topological relation is expressed by *sur* (the English translations take *on*, as in the following examples: *the point is on the point*, or *the page is on the page*). The first rule implies that the relation between *target* and *landmark* is asymmetrical: the localisation of the *landmark* is previously known and the localisation of the *target* is the new information. The second rule implies that the *landmark* evokes the notion of a social ritual or routine in the mind of the discourse participants. This routine specifies the position of different *targets* with respect to the *landmark*, and only *targets* capable of playing a role in the routine are permitted[38]

The use of *sur* is described by Vandeloise as determined by a functional relation between two entities, which he calls the *bearer/burden relation*. This relation behaves like a family resemblance concept that combines the following characteristics (Vandeloise, 1991: 194):

a) The bearer is generally lower than the burden.

b) The burden is generally in contact with the bearer.

c) The bearer is generally larger than the burden

d) The force of the bearer works against the force of gravity on the burden.

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[38] This rule recalls the notion of frame, scenario, script and event frame.

With regard to English *in* (Vandeloise, 1994: 172ff.) the author suggests that the relation between subject and object of the preposition can be symbolised as C/c (Container/content), where three-dimensionality and inclusion are only usual consequences of this relation. The crucial aspect in the relation C/c is the dynamic interaction between its components. Thus, in the following examples: *The bulb is in the socket* and **The bottle is in the cap*, the spatial relationship between the objects is identical, but neither dimensionality nor inclusion can provide an explanation for this difference in acceptability. However,

> ...while the socket exerts a force on the bulb and determines its position, the opposite occurs with the cap and the bottle [...] the term describing the object that determines the position of the second must stand on the right of the preposition.... (Vandeloise, 1994: 173)

Therefore, force is a dominant characteristic of the relationship C/c. The author admits that spatial and dynamic criteria co-occur in most situations. They form a *complex primitive.* The traits proposed for the *complex primitive* of *in* are the following:

1. The contained object moves towards the container.
2. The container controls the movements and/or prevents access to the content.
3. The contained object is included, at least partially, in the container or in the convex closure of its containing part.

In a *complex primitive,* the more usages a trait can explain, the more linguistically relevant it is. The relationship C/c may be canonical, where all the traits apply for its explanation, as in *the chicken is in the box*, or it can be marginal, when only one of the traits applies, as in *the pear is in the bowl*, when the pear is on top of other pieces of fruit, and it is actually out of the interior of the bowl, but its position is in fact controlled by the bowl.

The description of the relationship C/c is structured as a family resemblance, and one of its features can single out and motivate alone a usage of the preposition. This relation, because of its interactional nature, clearly links language acquisition to knowledge of the world:

The concept C/c is first globally conceptualized by the child, through the most characteristic situations, for which all the characteristics of the relationship are met. Only later are these properties recognized and analyzed. At this juncture, the child can learn which combinations of properties are conventionally admitted by his/her language to widen the scope of the preposition associated with the relationship C/c. Languages differ in those choices. This discrepancy makes the use of prepositions especially difficult to master in second language acquisition. (Vandeloise, 1994: 181)

As a consequence of this functional approach, three-dimensionality is rejected as a valid linguistic description for the landmark of *in*, since "strictly speaking, only the fictions of our imagination are not three-dimensional!".

4.7.2   Comment

In Vandeloise's descriptions the geometric configuration of the landmark is completely ignored. It is no longer necessary to make the effort of assigning points, surfaces and volumes to the entities of the world. Topological considerations, however, are incorporated as a non-central part of the semantic structures under analysis. Judgements related to functionality are introduced as essential components. There is a third aspect in the semantics of spatial expressions which is determined by the type of interaction between trajector and landmark, as far as force and direction of the movement is concerned. For instance, the interactional axis that determines the direction of the movement for *at* is canonically the horizontal axis, whereas for *on* it is the vertical axis; finally, for *in* the axis of the movement is defined relative to the contained canonical centre of the landmark. With regard to the semantic description of English *in*, it can be noted that this aspect is only suggested, but not discussed by this author.

Vandeloise uses three parameters for the description of *in*, namely, dynamic, functional and topological. Nevertheless, he does not state explicitly that these should be the three aspects of meaning that define the meanings of all prepositions. In his descriptions of French *à* and *sur* the three parameters are not used systematically in the same way.

4.8   Summary

The semantic structure of *at, on*, and *in* has been traditionally understood as a matter of geometric configuration of the objects or participants in the relation. The standard description of their meanings implies that the complements of these units are conceived of as points, lines, surfaces or volumes by native speakers. This geometric conception is complemented by topological judgements in most standard descriptions:

a) *At* is mainly described as introducing a complement which is conceptualised as a point by native speakers (Lindkvist, 1950, 1978; Quirk et alii, 1985; Herskovits, 1986; Cienki, 1989; Dirven, 1989). Some authors like Leech (1969), Bennett (1975), or Hawkins (1984) vary this vision by calling *general locality* or *indeterminate* the geometric configuration of the landmark. Topological considerations added are the relation of *proximity, juxtaposition* (Leech, 1969), and the *inclusion in region* (Miller & Johnson-Laird, 1976). Cienki (1989) is the only author that includes a sense of *at* as determined by the relative function of the participants in their interaction, which is independent of the *point sense*. Dynamic uses of this preposition are always described as motion where the end of the path is the spatial configuration previously posited for the stative uses.

b) O*n* is commonly described as introducing a complement conceptualised as a line or surface (Lindkvist, 1950; Leech, 1969; Bennett, 1975; Miller & Johnson-Laird, 1976; Hawkins, 1984; Quirk et alii, 1985; Herskovits, 1986; Cienki, 1989; Dirven, 1989). Topological features like *contiguity* or *contact* are generally added. The relation of *support* is mentioned without reference to its functional character, of which the authors seem unaware. The outer boundary of the landmark as a relevant notion is introduced by Cienki (1989). In all cases, dynamic uses are again described as mere motion where the end of the path is the spatial configuration posited for the stative sense − only Lindkvist (1950) refers to the orientation of the movement, horizontal for *at,* and mainly vertical for *on*.

c) *In* is described as introducing a complement conceptualised as an area or volume (Lindkvist, 1950; Bennett, 1975; Quirk et alii, 1985; Dirven, 1989), or a three-dimensional entity (Leech, 1969), or a MEDIUM configuration (Hawkins, 1984, 1988). In some

descriptions, however, the topological relation of *inclusion* is emphasised (Miller & Johnson-Laird, 1976; Herskovits, 1986; Cienki, 1989), though this *inclusion* may be partial. Vandeloise (1994) rejects the geometric description, and posits a meaning based on the relative function of the participants. The control of the container over the contained object is emphasised. He admits of a certain degree of relevance for the topological relation of *inclusion* as well. Finally, dynamic uses are acknowledged by most of the authors, but the nature of the motion is not described.

I agree with Vandeloise that the contrast between *at*, *on* and *in* does not lie in the Euclidean geometric distinctions relative to their complements. Rather, I will try to argue in favour of three parameters, namely, visual configuration (which includes topological considerations), force dynamic interaction (Talmy, 1988), and functional configuration as the three aspects that define the relationship between trajector and landmark.

5. *A MODEL AND METHODOLOGY FOR THE ANALYSIS OF AT, ON, AND IN*

5.1   Introduction

The aim of this chapter is to present the model that will be adopted in later chapters for the analysis of the three lexical items *at, on,* and *in*. This model assumes the notions introduced in chapter 3. In addition it represents a further step in the conception of radial networks for prepositional polysemy with regard to those conceptions introduced in chapter 4. In the second half of the chapter, the corpus utilised is briefly described. Finally, aims and procedure are commented on.

5.2   A multimodal system for spatial polysemy

The Euclidean conception of space has traditionally provided a model for linguistic spatial meanings. However, Clark (1973) distinguishes different ways of perceiving space by human beings. According to this author human beings perceive space following several parameters in order to construe perceptual space (P-space):

a) *Physical space* implies the perception of three dimensions defined by three axes (length, height and width).

b) *Geological space* emerges from the perception of gravity and the ground level as constant features of our experience.

c) *Biological space* is defined in relation to the human body, with a head on the top, symmetrical organs for perception (eyes, ears, hands, etc.), motion forwards, and erect position that constitutes the human canonical position.

d) *Social space* is determined by the way human beings interact with each other, i.e. face-to-face, performing what Clark calls the *canonical encounter*.

In addition, there is *linguistic space* (L-space). L-space is the semantics that each language uses to reflect and conceptualise P-space, as described above. It is assumed that there must be a direct correlation between P-space and L-space. Linguistic meanings cannot contradict the organisation of human perception, a principle expressed in Clark's correlation hypothesis: "the structure of P-space will be preserved in L-space" (Clark, 1973: 28). Therefore, L-space shows the conceptualisation of points, lines, and planes of reference; the ground level with positive and negative poles, up and down, right-left, and back-front distinctions; and finally, canonical position, as well as canonical encounter, reflected in egocentric meanings and deixis. The universality of perceptual principles does not imply that L-space should have the same form and structure for all languages. The most common devices used for L-space are adpositions, which in English turn out to be prepositions and adverbial particles.

Recent research in language acquisition shows that acquisition of linguistic meanings is simultaneous to the successive ways of spatial construal that reflect the conceptualisations of space the child is capable of (Bowerman, 1996, 1997). According to Johnston and Slobin (1979), conceptual development predicts a "roughly universal sequence in the development of the underlying notions expressed linguistically by the child, as a reflection of universals of cognitive development interacting with standard communicative settings". Semantic intentions are mapped onto surface utterances in ways that differ across languages, since each language reflects a particular way of how things can be said and not what or which things are to be said (Johnston and Slobin, 1979). These conceptualisations are based on *bodily experience*, and appear first in prelinguistic experience and cognition in the form of image-schematic structures, in the sense explained by Johnson (1987) and Lakoff (1987). These *image-schemas* are perceptively basic, but this does not mean that they are undecomposable. In other words, *image-schemas* are not semantic primitives, but perceptual primitives, in the sense that they are formed as gestalts. We should observe that the different ways of perceiving space, as described by Clark, can contribute diverse aspects to the creation of these gestalts.

More recently, Deane (1993: 115) has proposed a multimodal conception of meaning for prepositions that could be viewed as a new version of Clark's P-space. In Deane's terms, human beings perceive and conceptualise three aspects of space:

a) *Visual space images*, which correspond to Clark's physical space. They represent spatial relationships in terms of separation, contiguity, angle of vision, and any aspect related to the position of entities in relation to each other, i.e. their topological relationship.

b) *Manoeuvre space images*, which roughly correspond to social and biological space. This kind of perception processes information relative to motor control, and the capacity to interact with other people and manipulate objects, as well as the body itself.

c) *Kinetic space images*, which encode the information necessary to calculate force-dynamic interaction, in terms of paths, directions, axes, gravity, relative orientation of the participants, etc.

These aspects of perception cooccur in human experience. They are prelinguistic in character, and form part of the human bodily experience that prompts the creation of new concepts in the child's mind. The succession of experiences that conjugate the same aspects of space perception will prompt a conceptualisation − a construal arrangement − of trajector-landmark relationships, which will trigger the impetus for a new *conceptual schema*. I propose *conceptual schemas* based on perceptual space basically following the three specifications of Deane's multimodal scheme. The idea of *conceptual image-schema* coincides with what Dewell (1994) calls 'central schema', Rice (1996) calls 'central reference point', and Vandeloise (1991) calls 'impetus'. With regard to many aspects, these authors follow the tradition of Brugman (1980), Lindner (1983), and Lakoff (1987). This basic *conceptual schema* will be the origin for the meaning of a word in the speaker's repertoire. In Vandeloise's terms:

> Diachronically I will suggest that the symbolic association between signifier and signified must have been transparent at its origin. This original referent I call the *impetus* of a preposition. The evolution of a word's meaning from its impetus may often be anecdotal and accidental; the motivation of its present distribution may be

lost and may appear synchronically arbitrary. In fact, in the case of spatial prepositions, I will show that the multiplicity of *usage rules* governing the prepositions, and the *selection restrictions* qualifying them, are systematically motivated. When the impetus corresponds to a global concept, its role is confirmed by evidence from language acquisition. (Vandeloise, 1991: 43)

As the child grows up, that initial *conceptual schema*, which Vandeloise calls *impetus*, will be successively applied by the child to the categorisation of new experiences. Some of these new experiences will not exactly fit the whole set of specifications of that schema. The *conceptual image-schema* will offer a basis for new senses by virtue of natural, independently motivated image-schema transformations or shifts. In addition, partial sanction of the schema will mainly consist of profiling or highlighting various aspects of perceptual space. In this way, polysemy appears. A chain of senses linked by family resemblances is set off.

5.3   *Semantic description*

In the semantic description presented in this dissertation, the *conceptual schemas* of the lexical units *at*, *on* and *in* conjugate all aspects of perceptual space, since all of them are salient for a child in prelinguistic stages. People perceive and are aware of the topology of objects, which is intrinsic to the situation. But people are also aware of their function as well as the patterns of interaction that make it possible for them to recognise, use, and categorise objects. The latter are not intrinsic to the situation but *observer relative* aspects, i.e. social facts (Searle, 1995). The encyclopaedic character of semantic structure is, therefore, assumed (Haiman, 1980).

The *conceptual schemas* are represented as pictures that will remind the reader of their gestalt nature. Nevertheless, these pictures are assumed to be mere representational devices, and they are not granted any psychological reality themselves. Only the gestalts they represent are claimed to be psychologically real. As gestalts, they are decomposable but the parts acquire their sense only in the whole they form part of, and not in isolation, i.e. they are not primitive

semantic features. Each *conceptual schema* is explained in terms of three aspects of perceptual space, namely, *topological configuration* (topological relation between participants), *functional configuration* (functional relation, which corresponds to Deane's manoeuvre space images), and *force-dynamic configuration,* kinetic aspects of the relation between the participants, e.g. their motion and force patterns (Talmy, 1988). All three aspects simultaneously conform the *conceptual schema* or central meaning of each term. The vocabulary used to refer to the different kinds of topological, functional, and force-dynamic relationships has been partly drawn from Sinha & Thorseng (1995), insofar as these authors provide an adequate label for the relationship described[39].

As perceptual aspects are defined by direct bodily experience, it is assumed that the *conceptual image schema* is acquisitionally previous to meaning specialisation and extension, i.e. that it is the first meaning acquired by children. It also constitutes the conceptual basis from which specialised and extended meanings derive. The trajector and landmark constitute the figure and ground of the gestalt, and correspond to the head and the complement of the prepositional construction $N + P + N$. In the syntactic construction $N + V + P + N,$ verb and preposition are both relational predicates that share trajector and landmark. Therefore, verb and preposition must be semantically compatible in terms of perceptual space specifications. Particular construal arrangements and framing may influence the concrete configurations for each lexical unit under analysis. Thus, some syntactic constructions may leave one of the elements unspecified. For example, whenever *on* or *in* appear as adverbs, the landmark is not explicit, and remains unspecified, but it is still an element of the semantic configuration of that lexical unit.

Meaning specialisation mainly consists of the profiling of one or more of the three configurations of space over the others. Extensions are explained as metonymic and metaphorical mappings of these configurations onto other domains of human experience (social, scientific, etc.), as well as the creation of mental spaces in the domains of content, discourse and pragmatic situation. Metaphorical and metonymic extensions however, are only described insofar as they motivate a sense of the lexical item under analysis. Further

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[39] These authors propose a coding system for spatial relational reference providing labels for different topological, functional, and force-dynamic relationships, though they do not seem to be aware of this trilateral distinction. The authors acknowledge their coding system might not be complete.

metaphorical expressions are not described. Thus, the metonymic/metaphorical pattern ACTIONS ARE DIRECTED MOVEMENTS is adduced to explain an extension of *at* based on its force-dynamic configuration, so that it is used with verbs of action like *wave*. On the other hand, metaphorical expressions that do not motivate new senses, like *wave your ideas at the audience* are not described since they imply a metaphorical use of the whole expression *wave at,* as well as a metonymic use of *audience*, and this type of description is beyond the scope of this work.

The result of the analysis is a semantic structure that conforms to the model of radial categories, with the *conceptual schema* at the centre of the network, which constitutes the origin of the many senses of each unit. As Sandra and Rice (1995) point out, a radial category shows the polysemy of an item in different ways. First, it shows the various senses of a single morpheme that are found in a given language. Second, it shows which one of these senses is deemed to be the primigenial one, and which ones are peripheral. Third, and most important, it shows what senses are directly linked to each other, i.e. the conceptual distances between senses, as well as the mapping of their extensions.

The prototype of the category will not necessarily coincide with the conceptual schema, but may be determined by the *cue validity* of particular aspects of the gestalt. As a criterion for establishing the first sense (sense 1), perceptual considerations are taken into account. The three perceptual aspects proposed by Deane (1993) provide a framework that can be adopted in the analysis of other spatial lexical items. Visual, manoeuvre, and kinetic space show a fairly complex array of possibilities for meaning. On the other hand, a diachronic perspective in the ontogenetic sense has been adopted, assuming the primigenial sense to be the first usage which children become familiar with in early childhood. Further senses are assumed to have appeared later in the child's linguistic development. So, the more peripherally a sense is represented in the network, the later it is assumed to have been acquired by native speakers. The network, then, represents an adult stage of that development.

Criteria for extension are inspired by the methodology followed by Dewell (1994), although not all of his procedures may apply here. At the first level of specialisation − i.e. senses directly linked to the central schema -, image-schema transformations take place by simple

highlighting of one of the perceptual aspects. Further levels are represented by means of Greek letters. For these extensions, other procedures are employed such as blending spaces, semantic bleaching, or double highlighting.

Perceptual aspects − topological, force-dynamic, and functional − mark conceptual regions. These conceptual regions are not separate, but merge into each other, so that mixed senses may appear. For the same reason, senses in one region are more or less related to other senses depending on their location with respect to other regions. Therefore, the passage from one sense to another is gradual, to the extent that many instances from real speech and writing are of problematic classification. The network is assumed to be a graphic representational device of linguistic usages with no psychological reality itself. Nevertheless, the network is compatible with that reality, since it makes correct predictions on actual language use.

Finally, the network represents an idealised mapping of adult usage, since the corpus analysed corresponds to situations where language is used by adults. The network proposed meets the requirements stated by Sandra & Rice (1995) for discrimination capacity, relational structure and conceptual distance. A multimodal system, as well as image-schema transformations provide a method for sense discrimination. Relational structure is shown by links between senses in the network. Conceptual distance between senses is prompted by the sharing of family resemblances, and is graphically shown by the ascription of senses to conceptual regions.

5.4 Methodology and Procedure

5.4.1 Corpus analysis vs. psycholinguistic experimentation

Cognitive linguists have strongly criticised the overwhelming presence of introspection in linguistic methodology (Geeraerts, 1994; Sandra and Rice, 1995). The fact that the theorist turns to personal knowledge of the phenomena studied may lead to *ad hoc* generalisations, as

frequently occurs in generative theory[40]. The two alternatives to introspection that are currently applied within the scope of cognitive linguistics are psycholinguistic experimentation (Rice, 1996; Bowerman, 1996; Beitel et alii, 1997) and corpus analysis (Geeraerts, 1994). Geeraerts points out that while psycholinguistic experiments lead to elicitation of individual phenomena, corpus analysis provides descriptions of social phenomena. Thus, while a subject in an experiment may provide information about the prototypical or peripheral status of a particular sense of a word for an individual, the analysis of corpora can offer the same information at a social level. Geeraerts calls it onomasiological entrenchment. Thus, higher frequency in the corpus implies higher entrenchment of a given sense of a word in the linguistic community. Taking this into account, I shall attempt to determine prototypical uses of each particular unit according to their frequency in the corpus, which in turn shows the cue validity of the most relevant perceptual aspect for each sense.

5.4.2   The corpus

The Brown Corpus of American English (Francis and Kucera, 1961) (henceforth BC) is used for the semantic analysis of the lexical units *at, on,* and *in*. A total of 2,238 instances of *at*, 2,511 of *on*, and 4,648 of *in* from 210 different texts are analysed. The texts appear in the BC classified into 15 types, namely, Press: Reportage (A), Press: Editorial (B), Press: Reviews (C), Religion (D), Skills and Hobbies (E), Popular Lore (F), Belles Lettres (G), Miscellaneous (H), Learned (J), General Fiction (K), Mystery and Detective (L), Science Fiction (M), Adventure (N), Romance (P), and Humour (R). In order to avoid biased results through the influence of a particular type of text, the same number of texts (15) is analysed for each type, except for those types that offer fewer than 15 in the BC − Science Fiction (6 texts) and Humour (9 texts). Though only a part of the whole BC has been used, the sample is sufficiently representative. The use of this corpus offers advantages, such as the high diversity of speakers, situational contexts, and linguistic contexts, since the different types of texts guarantees linguistic variability. The influence of particular idiolects, topics, or dialects (social or geographical), is therefore minimised.

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[40] See Lakoff (1991) for a devastating critique of generative methodology.

The examples analysed are codified according to the BC coding. Type of text is referred to with a capital letter, for instance, Press Reportage texts as A. Within each type, texts are numbered from 1 to 15. Finally, within each text lines are numbered. So, the appearance of a lexical unit can be precisely localised in the corpus, e.g. A1: 25 means that the instance referred to is in line 25 of text 1 in the group of Press Reportage texts.

5.4.3   Aim

The aim of the analysis is to make a detailed investigation of the polysemy of three items, namely *at, on*, and *in*, as they occur in the BC. While I attempt not to disregard any of the extended and metaphorical meanings, I also devote full attention to prototypical meanings, as well as patterns of image schema elaboration and extension.

5.4.4   Procedure

This work and its progression is organised in different phase stages:

1.- *Collection of data*: It consists of the retrieval of all the instances of the three items to be analysed, as well as the production of concordance and frequency lists. The programme used for this purpose was the TACT provided by the ICAME Collection CD ROM, as delivered by the Norwegian Computing Centre for the Humanities. The work in this phase aims at establishing a preliminary material and working material. The main idea is to produce a KWIC concordance of the whole corpus, where each selected item is accompanied by a maximum of 100 characters in both directions. The purpose has been to provide a sufficient amount of information for the task of disambiguation in those cases where more than one sense could have been interpreted for a single item under analysis.

2.- *Morpho-syntactic classification*: This consists of a typological classification of the resulting combinations with regard to their grammatical structure (word-class and phrase category).

3.- *Semantic classification:* This consists of the distinction of patterns of image schema elaboration and extension (cf. §5.3).

4.- *Determining prototype senses:* Absolute frequencies of particular senses are taken into account in establishing a prototypical sense and the central grammatical use for each item. Higher frequency implies a higher degree of cue validity for a particular aspect of semantic space. Higher frequency senses are assumed to possess a higher degree of onomasiological entrenchment in the linguistic community under analysis. Lower frequency senses determine the semantic periphery of each category. Likewise lower frequency syntactic contexts determine the syntactic periphery of the category.

6.   THE SEMANTIC STRUCTURE OF AT

6.1   Morpho-syntactic usage

For the syntactic-semantic analysis of the lexical unit *at*, no context discrimination was made from the syntactic point of view, i.e. not only 'NP P NP' constructions, but all constructions in which *at* appeared were considered for the analysis. This analysis shows that this lexical unit appears only in prepositional constructions as described by the grammar (cf. 2.2.1), except for just one example, where it is a nominal prefix. The following morpho-syntactic environments for *at* have been observed:

a) Head of a postmodifier PP in the construction: NP P NP. Example:

> *...as an instructor at the University of Oklahoma,... (A02:77)*

b) Particle with prepositional verbs, in the construction: V P NP. Example:

> He doesn't want her to look frowningly at him (B13:105)

c) Head of a postmodifier PP in the construction: A P Np. Example:

> He's mad at the world (A13:49)

d) Head of an adjunct PP in a VP in the construction: V P NP. Example:

> It looks more like they are going to play at the beach instead of taking lessons on bettering themselves (B16: 18)

e) Nominal prefix, in the construction: P-N. Example:

Jensen got only six hits in 46 at-bats for a 130 batting average in the first 12 games.(A13:42)

6.2   Conceptual schema of at

The initial hypothesis in this chapter claims that children first form a concept – or *impetus* in Vandeloise's terms – based on their experience with objects and artifacts, for the lexical unit *at*. The initial *impetus* for the gestalt of *at* as a new spatial relational concept is based on bodily experience and on perceptual space. Consequently, a point cannot be a natural conceptualisation. People do not have direct experiences of points as such. The very concept of a point is a geometrical abstraction that people reach as adults by means of abstract thought. The meaning of *at* cannot be based on that concept. According to the bodily experience hypothesis, a series of aspects must be noticed:

1.- The trajector of *at* is a human being or an entity that can be conceptualised as having a functional front (animals included). This functional front is conceived of as if for interaction with the landmark, following a human based model. Thus *the chair at the table* is acceptable, but not **the ball at the table*. The reason is that chairs may be displayed as if for interaction with respect to tables, with one and only one of their sides oriented towards tables. Otherwise chairs may be *by, near, in front of,* etc. tables, but not *at* them. On the other hand, balls lack any side that could be particularly oriented for interaction with tables, in an analogous way to human beings. Therefore, in situations where balls are construed in a spatial relation with tables, lexical units like *by* are used instead of *at*.

2.- The landmark is an artifact that offers the trajector an accessible side for interaction. Here *artifact* designates any object or living being conceived of in such a way that human beings – or by extension other entities conceptualised as having a functional front – can interact with it, either following some natural or culturally acquired behaviour, or adopting an attitudinal position. Thus, *the man at the tree* can be understood as the *man picking fruit*, *the man taking care of the tree*, etc., as long as the parts of the tree addressed are perceived as accessible for use, manipulation or operation.

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3.- According to the force-dynamic configuration of the relationship – kinetic or geological space –, trajector and landmark positions in relation to each other define a common axis, along which their relationship can adopt a certain directionality. For the *at* relation, that axis is defined by the functional front of the trajector, as well as its orientation towards the landmark. Thus, that axis is prototypically the horizontal axis with respect to the human canonical position as standing on the ground. According to this axis, a chair lying on the floor could not possibly be construed as *at* a table, and neither can a chair be *at* a table if the table is lying – not standing – on the floor. So, the axis of the motion, or the directionality of relative positions, is defined by a line which is prototypically perpendicular to the axes of the trajector and landmark that determine their standing position. If the trajector or landmark is not standing in the actual construal of the relationship, a rotation of this imaginary line may occur. The resulting axis is no longer horizontal, since it must preserve its relative perpendicularity with regard to the standing axes of the trajector and the landmark.

4.- According to topological configuration, trajector and landmark bear a relationship of contiguity, or tend to be in a relation of contiguity. Though perceived contact implies contiguity the reverse is not the case. Perceptual contiguity does not necessarily imply contact, even though contact is not discarded. On the other hand, a *proximity* relationship would necessarily imply absence of contact, and for this reason the relation expressed by *at* cannot be described as one of *proximity*. The lexical unit *by* does express the relation of proximity.

5.- According to functional configuration – social space -, interaction between trajector and landmark is expectable, since their orientation follows the face-to-face pattern. Thus, a chair with its back towards a table is not *at* the table. In that case, the chair is seen as *by* the table, since the lexical unit *by* does not require that the functional front of the trajector addresses the landmark. The functional relationship is one of use or manipulation of the landmark. In any case, there is certain intentionality of the trajector with respect to the landmark in order to use it, manipulate it, or affect it. Thus, *A at B* indicates that *A* is using, or manipulating, or affecting *B* in the canonical way, i.e. as expected in normal circumstances in the situation expressed by the clause or phrase. This canonical way may be defined either by the biological

and physical configuration of the participants, or by cultural usages and customs of the linguistic community. Altogether, the relation is asymmetric.

6.- Trajector and landmark present clearly recognisable 'active zones' with respect to the meaning of *at*. These *active zones* roughly coincide with the sides they offer each other. Langacker (1991 *b*: 190) defines active zone with respect to a relation as "those portions of a trajector or landmark that participate directly in a given relation". Thus, in a construed situation where a man is picking fruit *at* a tree, the man's active zone is his face and the palms of his hands, whereas the active zone of the tree is the accessible boughs where the fruit is hanging[41]. To sum up, the trajector's active zone is defined by its functional front, and the landmark's active zone by any of its areas accessible to use or manipulation by the trajector.

7.- Trajector and landmark are conceived of as belonging to the same scale[42]. Thus, a situation is not construed where a chair is *at* a galaxy or a molecule *at* a table.

As a label for this conceptual schema, which is assumed to be easily perceived in early childhood, the expression ENCOUNTER will be adopted here. Strictly speaking, numbers 1 and 2 above specify trajector and landmark configurations as contextual elements of this lexical unit, whereas numbers 3 to 7 specify the meaning of *at*, i.e. the ways in which *at* determines the relationship between trajector and landmark. It has to be noticed that no reference to the geometric dimensionality of the participants is made. We find the schema instantiated in examples from the BC as the following:

> *In West Africa, for example, where meat is a luxury and babies must be weaned early*
> *to make room at the breast for later arrivals, a childhood menace is... (C17:32)*
> *Mary Dobbs Tuttle was back at the organ. (A13:22)*
> *She sat down at the table, shaking her head (N01:123)*

---

[41] The concept of active zone is related to the concept of search domain, as used by Miller & Johnson-Laird (1976). For a further illustration of this concept see Langacker's account (1991: 189-201).

[42] 'Scale' is used here in the sense of that dimension of imagery used in conceptualisation, as described by Langacker (1987: cf. 3.3.1; 1991 *b*: 7).

...the bus turned right along the Bosphorus, past ocean liners at anchor,...(E13:18)

Hank had gathered wood for a cookfire and his wife was busy at it now. (N10:15)

Current expressions which instantiate this schema are: *at the altar, at the wheel, at the desk/table, at anchor, at a keyboard (piano, organ), at the mirror, at the counter, at the window, at the bar, at bat, at the helm, at the well*, etc. which express situations where people use or manipulate tools, machines, or other kinds of objects. Certain verbs like *pull, tear, clutch, tug, yank, push, suck*, etc. can cooccur with this sense in prepositional verb constructions. These prepositional verb constructions incorporate the semantic burden of *at*. Thus, the relative orientation of the trajector and landmark is present, as their active zones face each other along an axis perpendicular to their standing axes. The functional relation of use or manipulation is also present, for example:

A shot or two went wild before Cobb felt something tug at his foot. (N14: 151)

Rachel [...] puffed at her cigarettes through a long ivory holder.... (K01:6)

[bushes] were covered with tiny white blossoms, their scant roots clawing at the ground,... (P04:121)
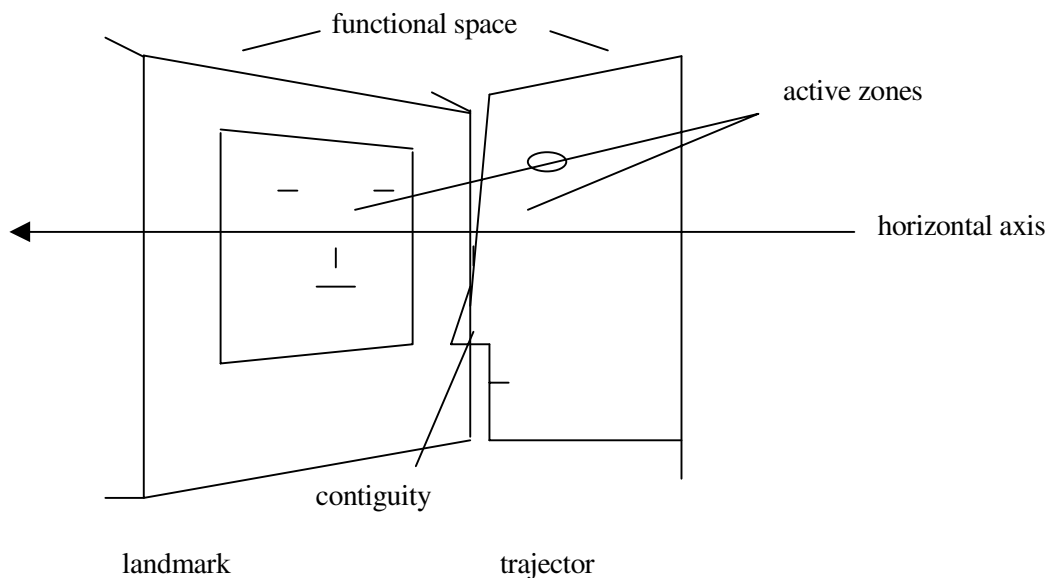
Figure 6.1: Basic conceptual schema of *at*: Encounter.

This *conceptual schema* determines sense 1 of the lexical unit *at*, and can be graphically represented as illustrated in figure 6.1.

A higher degree of lexicalisation is shown by expressions that are usually referred to as idioms. Certain idioms may be explained as having their origin in the *at* relation as exposed here. Thus, the expression *at home* may have been originated in the former sense of the word *home,* as the place in a dwelling where fire is made so that people gather *at it* (i.e. contiguous to it, disposing their bodies towards its heat to get use of it, and so keep themselves warm). The present connotations of the expression *at home* seem to recall this original literal meaning. The unit *at* is found in collocations like *at the opportunity, at a crossroads,* that refer to abstract domains. In that case the opportunity or the crossroads is conceived as something which is addressed or faced forwards by somebody. Examples:

> *He has served in positions of greater glamour, both at home and abroad. (B07:72)*
> *...you were soaked and muddied and your life was at stake. (L04:116)*
> *... I was at some sort of crossroads and would have to decide soon what I was going to do in my life. (L01:114)*
> *Failing this, he would pull alongside at the first opportunity. (B09:115)*

6.2.1 Metaphorical extensions of the conceptual schema

Metaphorical mappings and their mechanisms occur as explained by Lakoff's metaphor theory (cf. ch. 3). A few metaphors appear in the corpus analysed, which get their mappings from the basic conceptual schema: 'SOCIAL EVENTS are ARTIFACTS', 'ACTIVITIES are ARTIFACTS', 'STATES are ARTIFACTS', and 'CAPACITIES are ARTIFACTS'. According to these mappings, social events, activities, states, and capacities are conceptualised by speakers as the landmark of the relationship expressed by *at:*

1.- Typically, in the metaphorical pattern SOCIAL EVENTS are ARTIFACTS, a human being or a group of human beings is conceptualised as facing and handling the situation or event, as if making use of it, manipulating it or behaving in the expected canonical way *at it*. The landmark designates different types of social events like meetings, conferences, sessions, parties, lectures, interviews, receptions, conventions, talks, negotiations, concerts, shows,

ceremonies, auctions, trials, hearings, balls, summits, performances, mass, funerals, discussions, different types of gatherings around a meal, like banquets, luncheons, dinners, etc. as in these examples from the BC:

Superintendents at dog shows state it is becoming more difficult to obtain a licensed Handler... (E05:73)

"You are bound to get involved with people when you have children", Fran had told me at our first meeting,... (R02:35)

I didn't see her till several days later at the wedding, and her face looked like it had never had a blemish on it. (L07:49)

2.- Likewise, in the pattern ACTIVITIES are ARTIFACTS, a human being, or group acts in a certain way 'at an activity' (cooking, playing, speaking, writing, different kinds of sport, war, work, an occupation, a job, a profession, games of different kinds, like chess, dice, faro, etc, tasks of different kinds, like a necropsy, a sale, a bath, different sorts of study matters, like maths, history, etc.). It may be argued that the origin of this metaphor is of a metonymic character, since a human being at an artifact is always carrying out an activity, or is about to do so, so that the activity is referred to instead of the artifact used to carry it out. Current expressions of this usage are *at work, at war, at your service, be at*, as in the following examples:

In 1942, however, the nation was at war. (H04:63)

...in Indonesia, Khrushchev found an American proud to be at total war with Communism (B26:64)

But he was back at work on a car. (L03:142)

...I have always had a yen to try my hand at writing (F06: 107)

There will be losses caused by emergencies that arise while he is away at his off-farm job (F13:24)

...,and I've got two baby brothers that are going to have college if I have to work at my profession until I'm an old maid to give it to them. (L01: 50)

3.- STATES are ARTIFACTS is a restatement of the already analysed metaphor STATES are LOCATIONS as described by Lakoff (1993), Lakoff and Turner (1989) and Lakoff and Johnson (1980) among others. In this case, the 'state-location' is seen as a situation which is

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canonically encountered, and from which the trajector gets some profit or use. States can also be expressed as locations using the preposition *in*. The contrast between *at* and *in* precisely consists of the functional, as well as the force-dynamic aspects of the relation. With regard to states, while *in* expresses a situation where the landmark controls the trajector, i.e. the state deprives the trajector of self-control or motion control, *at* expresses a situation where the trajector searches for, and uses in a certain way, or gets profit from, the state where it finds itself. This sense explains certain idiomatic expressions like *at rest, at peace, at sb's disposal, at ease, at leisure,* etc. The expression *at home* has adopted this sense to indicate that the trajector feels comfortable. Other expressions which express state such as *at fault,* or *at risk* denote states that are not used or got profit from, but the use of *at* instead of other lexical units reminds us that the state is somehow confronted by the trajector. Examples:

> *Instead, the audience can sit back at ease, ... (D01: 33)*
> *She was finally at rest in truth, of her own proud free choice. (P11: 107)*
> *Mr. Podger mentally retraced a day that had left him greatly contented and at peace.*
> *(B09:15)*
> *Berman, whose fame has rested in recent years on his skills as a night club*
> *monologist, proved himself very much at home in musical comedy. (C04:48)*

4.- Finally, two metaphors appear as marginal in idiomatic expressions. First, the metaphor 'HUMAN CAPACITY IS AN ARTIFACT', where the human being who plays the role of trajector is using his capacity, as in the expression *at will,* or in less idiomatic uses with words like attention, as in these examples:

> *The elderly chauffeur, immaculate in a dark uniform, stood stiffly at attention holding*
> *open the door of the town car. (L01:143)*
> *Mr. Podger heard again, at will, the voice of the auctioneer ... (B09:41)*

The other marginal metaphor is 'PROCEDURES are ARTIFACTS', which has only been found in the idiomatic expression *at random*, the only context where the lexical unit *random* is used as a noun in English referring to a random procedure or statistics. Thus, this idiom is used where a random procedure is used or 'operated at' in order to obtain some result, selection, combination, etc. Example:

Table two shows operating cost data of state vehicles selected at random. (H04:88)

In all these metaphors, the trajector is not necessarily a human being, but some other element of the same perceptual domain, which adopts the role of trajector by virtue of a metonymic process. Some possible metonymies are HUMAN ACTION is HUMAN BEING, HUMAN ACTIVITY is HUMAN BEING, or HUMAN-MADE OBJECT is HUMAN BEING. Examples:

> *Demonstrations of new and projected training aids were conducted at the Medical*
> *Service Instructor's Conference... (H10:23)*
> *...the propaganda impact on the free world of the document scheduled at this meeting*
> *will be far less than had been originally anticipated. (B07:51)*

6.3   Specialisation of meaning

Further senses can be obtained by profiling certain aspects of the conceptual schema. Each new sense shows metonymic and/or metaphorical extensions.

6.3.1   Force-dynamic configuration senses

If the force-dynamic configuration of the participants in the situation is profiled, new senses appear. This phenomenon may be simultaneous to the semantic bleaching of other aspects of meaning (Sweetser, 1988). The interaction axis between trajector and landmark is highlighted as the central aspect of the relation. Other aspects like the topological relation of contiguity and the functional orientation remain in the background, though still present. Thus, *at* is compatible in context with other linguistic units which express motion along an axis, as well as the tendency to reach a goal, even though the final contact with that goal is not necessarily achieved. The direction of the movement is also relevant, and is determined by the trajector's functional front, as well as by the landmark's accessible active zone. Further senses are derived from the central force-dynamic sense (*Search for contiguity*) as far as the background

features reappear (*contiguity achieved*), or the orientation of the interaction varies. The following senses may be observed:

a) *Search for contiguity (sense 2a)*: When kinetic aspects of the relation are profiled, the direction of the interaction between trajector and landmark is highlighted, and the result is the use of *at* with motion verbs and other dynamic expressions. In sense 2a the interaction departs from the trajector, and searches for the contiguity with the landmark while following the line of the axis that connects one to the other. As in the examples from the BC:

> *...he felt a fluttering object brush his face. He snatched at it savagely. (F02:88)*
>
> *Every time I closed my eyes I saw Gray Eyes rushing at me with a knife. (N04: 73)*
>
> *A small indian dived at Montero, who caught him with a swift upward stroke of his rifle butt. (N04: 152)*
>
> *The sharp wind slapped at him and his feet felt like ice... (K10: 49)*
>
> *He hunched his left shoulder into it and slashed at Robert's forearm with his own (L06:42)*

The context for this sense requires verbs like *beat, charge, come, dab, direct, dive, fire, flail, fly, go, jump, lash, lunge, make, run, rush, shoot, skip, slap, slash, smash, spit, spring, swagger, swing, throw, thunder*, etc. Thus, this usage is available in combination with 'direct at' type verbs for the formation of prepositional verb constructions. Sense 2a is illustrated in Figure 6.2. below:
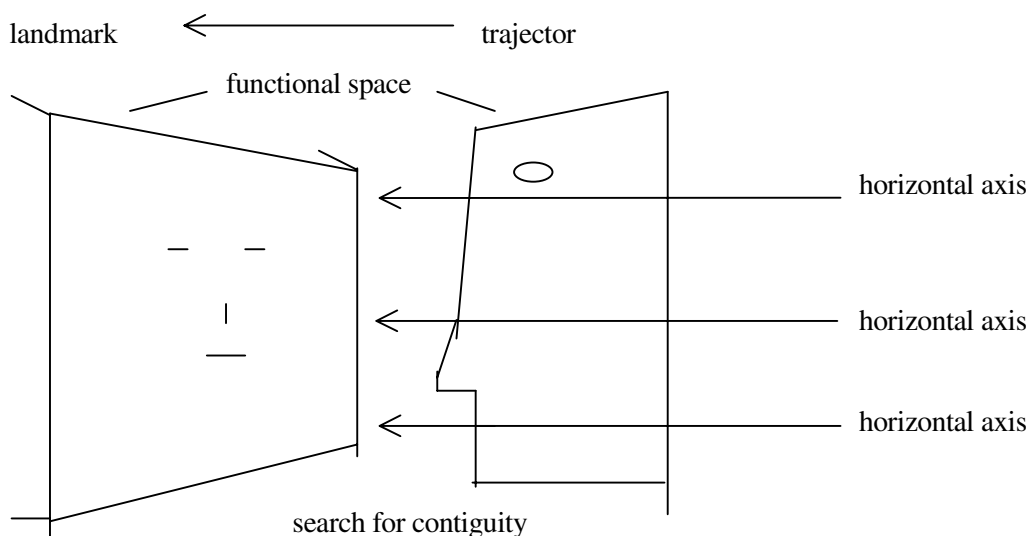
Figure 6.2: 2a sense of *at*: Search for contiguity

The feature 'search for contiguity' is compatible with contextual features denoting aggression or aggressive attitude. In addition, this feature is useful for establishing a semantic contrast with other relational lexical units, with respect to lack of aggressiveness. Thus, the contrasts *throw at* vs. *throw to*, *run at* vs. *run to*, *go at* vs. *go to*, etc. are based on this feature. The semantic feature cannot be attributed to the verbal element, since *throw, run*, or *go*, and many other verbs that cooccur with *at,* do not have it in other contexts. The feature 'search for contiguity' is then contributed by the lexical unit *at*, and it is this feature that makes *at* suitable for expressing aggression in the formation of prepositional verb constructions. In this context it adds the feature 'attempt to' with verbs of contact, when that contact is not achieved, with verbs like, *bite, jab, lash*, *pierce, poke, slap, slash*, *stab,* etc. Examples:

> *Does each tentacle of the octopus of City government lash at whatever it dislikes...?*
> *(B19:66)*

Three metaphorical patterns appear recurrently, as mapped from sense 2a.:

1.-Firstly, linguistic expressions of the CONDUIT metaphor, which implies that words and their meanings travel from speaker to hearer[43]. The metaphor is not only applied to words but also to noises and sounds produced by living beings. This first metaphor is instantiated with verbs of speaking – or any expression that denotes the uttering of words or noises which are 'directed' by the speaker with the intention of affecting the landmark – like *babble*, *bark, bellow, call, croon, cry, curse, hurl, nag, preach, roar, scream, screech, shout, shriek, sing, snap, snarl, speak, swear, talk, yap, yell,* etc. *At* forms prepositional verb constructions with these verbs. Examples:

> *The two women babbled and crooned at him. (M06:18)*
> *He had cursed at them and threatened them. (N11:16)*

2.- Secondly, the metaphor 'SEEING is DIRECTING', which implies that the ability to see consists of directing one's eyes or attention towards the thing seen, in an attempt to reach it. It

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[43] See Reddy (1993)

appears in contexts including verbs like *glance, gaze, glare, leer, look*, *peep, peer, pore, squint, stare,* etc. and forms prepositional verb constructions with these verbs. Examples:

> Look at the physical features of the land to determine how desirable it is for use,...
> (E21: 72)
> Liutenant Richardson gazed at the lights still burning on the port wall.... (F02: 64)

3.- And finally, 'ACTIONS are DIRECTED MOVEMENTS', a metaphor which implies that a speaker's action is conceived of as a movement towards the addressee. This metaphorical pattern occurs in uses with verbs like *aim, blink, frown, gesture, grin, make a grimace, make faces, laugh*, , *nod, point, scoff, scowl, shake one's fist, smile, smirk, sneer, wag, wave, wink,* etc. where *at* appears in prepositional verb constructions, as we see in the examples from the BC:

> *There was the squat loose-jowled man, smiling lopsidedly up at him. (M02:105)*
> *Both grinned at the detective. (K12:124)*

b) *Bi-directionality (sense 2aρ).* It may happen that the situation is construed as a bi-directional relationship along the force-dynamic axis. When the directionality of the interaction goes both ways on a reciprocity basis, a marginal sense appears where both trajector and landmark are searching for contiguity with each other. So, this sense would be derived from sense 2a. We can refer to it as sense 2aρ. Frederike van der Leek (personal communication) has suggested that a blend of two mental spaces can be interpreted in the construal of this reciprocal meaning, where two entities play the roles of both trajector and landmark at the same time with respect to each other. This can be predicted in the context of expressions like *each other*, as in this example from the BC:

> *But Mr. Podger and the driver of the sports car waved at each other. (B09:32)*

This type of blending may be operated on any of the extensions described for sense 2a. Expressions like *throw sth. at each other, yell at each other, look at each other, smile at each other,* etc. are thus common.

c) *Off contiguity (sense 2b).* A sense 2b is observed, for which directionality is also profiled in the conceptual schema. However, in this case the interaction departs from the landmark, so that it affects or tends to affect the trajector in such a way that the relation of contiguity tends to disappear. The force-dynamic pattern has been inverted, but the functional orientation of trajector and landmark remains. It is by virtue of this particular orientation that the force-dynamic axis is maintained. Thus, the conceptual distance is enhanced with respect to those senses where contiguity is more salient, and reduced to a certain extent with respect to senses where function is more salient. Examples:

> *The horses moved at a clump; (E11:64)*
> *Though his inner thoughts cringed at it, he forced himself to think back, recreating the scene... (L13:82)*
> *At a nod of his head they let go,... (F05:86)*

This sense is found in expressions like *at a gesture, at a remark, at an order*, *at a suggestion*, etc., and the idiom *at the expense of,* where the trajector is a result of the contiguity relationship, or a being whose reaction is conceived of as an effect prompted by the landmark. It is illustrated in figure 6.3, below.
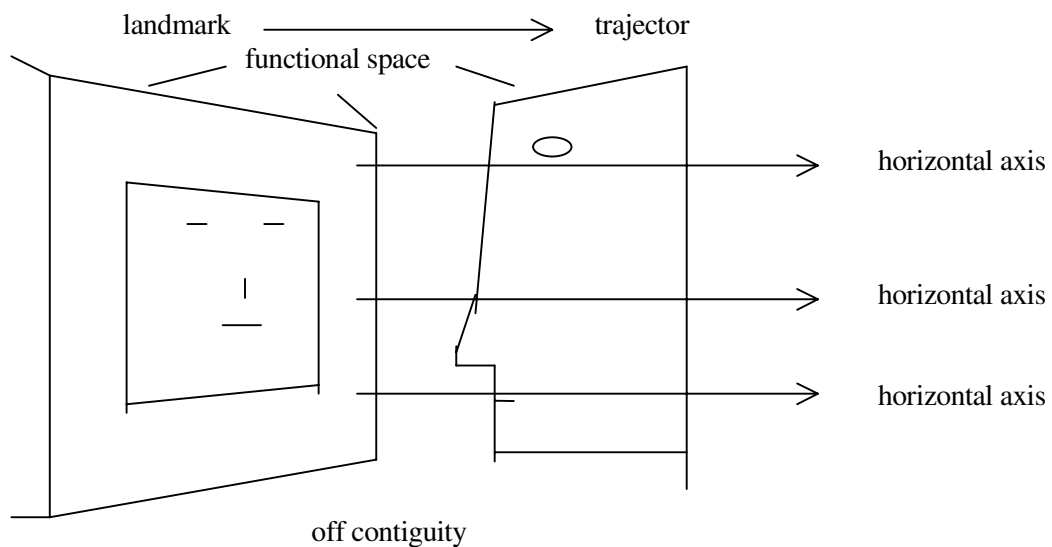
Figure 6.3: 2b sense of *at*. Off contiguity

Some authors like Dirven (1993) refer to this sense as a causative usage of the preposition. The causative relation is appreciated in examples like the following:

Still more time was consumed while the pilot, at the radioed suggestion of Continental
president Robert Six, tried to persuade the armed pair to... (A42:44)
...23 operators and office personnel stand ready to move into action at a minute's
notice. (B20:87)

Two metaphors are mapped from sense 2b:

1.- 'CAUSES are FORCES'. It seems that the causative sense is a metaphoric extension of sense
2b, with the pattern 'CAUSES are FORCES' which has its origin in the physical domain. The
cause of an effect on non physical domains or on human action is understood as the force
which acts upon an object in order to make it move. Examples:

Harold, [...], took over at the death of their father, (B12:14)
...firing their guns in unison at some indeterminate signal. (P13:81)

This pattern appears in phrases like *at the insistence of, at an invitation, at a signal, at the*
request of, at the expense of, and others of this kind.

2.- 'EMOTIONS are MOVEMENTS' Human emotions are understood as movements within
human beings, and are generated by other forces (surprise, fear, anger, sadness, etc. as
generated by a stimulus). This is illustrated in the following examples from the BC:

They seemed happy at the delay in unloading, glad at the chance to go ashore in a
lively liberty port such as Bari. (F02:72)
...failure to wonder at their basic mystery is outright avoidance of routine evidence.
(F03:22)

6.3.2   Topological configuration senses

The topological relation of contiguity is perceptually prevalent over force-dynamic or
functional aspects. Nevertheless, these remain in the background, and may produce
distinctions that can be reflected in distinct senses of the lexical unit.

a) *Coincidence (sense 3).* The first sense we usually think of for the preposition *at* is the one here referred to as 'coincidence' between trajector and landmark (or sense 3). In this case, topological space is profiled, and contiguity is highlighted, as illustrated in figure no. 6.4. Notwithstanding, functionality is still present, and the relative orientation of the trajector with respect to the landmark still plays a role, as can be appreciated in the examples from the BC:

> *At General Power's seat in the balcony there is also a gold phone. (G03:84)*
> *Ordinary Carey Williams, armed with a pistol, stood at the polls to insure order. (A01:76)*
> *The hospitable sign at the brink of most polls. (A17:34)*

Words like *location, place,* or *point* are frequent with this sense. The idiom *at hand* may have emerged from this sense, if the trajector is construed as coincident with the location of the hand, as for being used or manipulated. Example:

> *He felt his empty pocket and knew that Roberts had retrieved the only weapon at hand. (L06:14)*
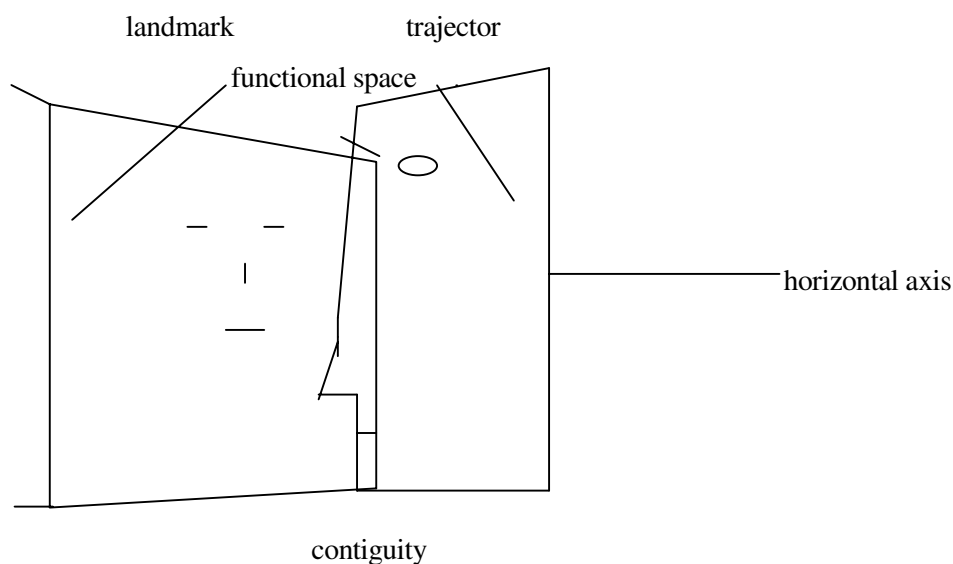
Figure 6.4: Coincidence.

The most pervasive metaphor expressed with prepositions is the time metaphor, whereby time is understood as physical space. Periods of time, understood as extensions which another entity, event, action, or state coincides with, are expressed by the coincidence sense of *at* (cf.

Wierzbicka, 1993). This sense generates a lot of recurrent collocations in expressions to indicate periods of time like parts of the day, such as *at night, at dawn, at dusk, at noon, at midnight, at day time*, or other periods like *at present, at times, at---time, at Christmas, at once*. It appears in less idiomatic expressions with words indicating periods of time like *period, date, interval, moment, turn,* etc.. The relation of the trajector with the period of time is one of coincidence but also of use, in the sense of using the time referred to for some purpose. Examples from the BC illustrate this usage, as in:

> *The executions took place at dawn only a few hours after Havana radio announced their conviction by a revolutionary tribunal... (A21:78)*
> *After television, "La Dolce Vita" seems as harmless as a Gray Line tour of North Beach at night. (A32:47)*
> *Marquis Pick (Gine Abbe-Direct Grattan) seems to be the pick of the stable at the present time. (E09:49)*
> *It was probably at this period that Littlepage got his first good look at the ordinary Russian soldier. (G50:87)*

Idioms like *at present, at the moment,* or *at once,* derive from this sense. The time referred to is conceived as coincident with the present time or present moment. In the case of *at once*, the unit *once* is understood as a very short time. In this sense *at* is used with lexical units with the meaning of events or periods to refer to the time of the event or period, i.e. *at birth, at death, at maturity, at infancy,* etc. Example:

> *Many other (probably nearly all) snakes at maturity are already more than half their final length.(J11:1)*

b) *Definite coincidence (sense 3α):* From the sense of coincidence we can derive a new sense where functional and force-dynamic aspects of perceptual space get bleached off. It seems that there is a semantic bleaching of the sort discussed by Sweetser (1988), whereby certain aspects of meaning are discarded, and a lexical unit begins undergoing a process of grammaticisation. I suggest that perceptual contiguity is even stronger for the *precise coincidence* sense (3α sense) than for the *coincidence* sense (3). The trajector is something

understood or construed as if attached to a part of an entity, and the landmark designates that part as illustrated in figure 6.5, below.

This sense occurs when *at* is followed by words that express 'a part of an entity' like *end, beginning, top, bottom, front, back, extreme, middle, centre, peak, level, head, edge, ridge, limit, plane, extremity, rim*, etc., as in this example:

Straight vertical edges, such as those at the back seam of a sock, can be woven together invisibly. (E15:150)

landmark   trajector
(functional space)

(axis)

contiguity
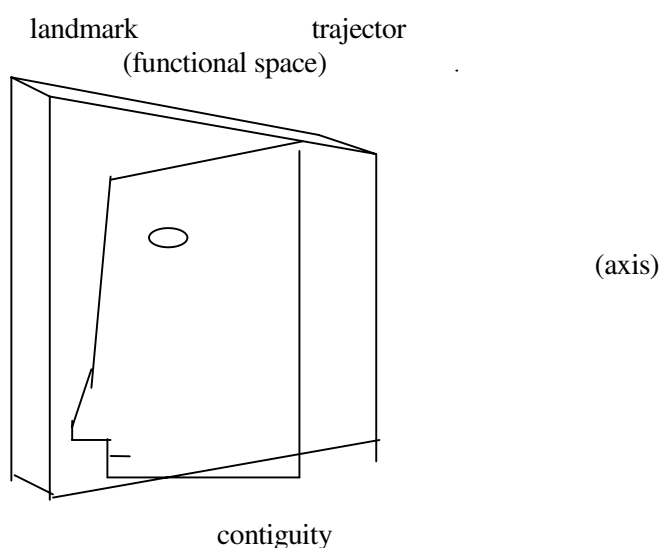
Figure 6.5: Definite coincidence

The entity construed as landmark may be seen as a whole or a series. I would suggest that the process of grammaticisation is turning the lexical unit *at* into a more schematic unit which may be referred to as a grammatical morpheme. In the context of lexical units that designate parts of other entities, this morpheme *at* is used to indicate that part as the location occupied by another entity. A new syntactic construction of the form *at the (part) of entity* originates by means of this process. This type of expression may be used in other domains different from the physical domain. In such uses the topological configuration is transferred to the abstract domain, and *at* loses its semantic force. The word that follows is then more salient semantically, as we see in these examples:

It is sex that obsesses them, sex that is at the basis of their aesthetic creed. (G13:55)

...at the peaks of the nuclear test... (B23:101)

Metaphorical extensions:

1.- The time metaphor utilises the same expressions as those listed above as well as others which indicate parts of periods of time like *start, outset, onset, conclusion, commencement*, etc. The time referred to is part of a larger period. This larger period may be expressed mainly by nouns indicating a time period, or nouns expressing an event, action, process or state, where the period equals the duration of these, as in this example:

> *...it would produce 17 million dollars to help erase an anticipated deficit of 63 million dollars at the end of the current fiscal year next Aug& 31. (A02:5)*

This sense explains collocations like at+stage, at + phase, to designate coincidence with and use of particular periods of a process, action or event. Examples:

> *Twelve projects proposed by private groups are at the contract-negotiation stage,... (A07:55)*

2.- In English, the expression of all numerical and scalar measurements by means of *at*-phrases adopts this sense by virtue of the SCALE METAPHOR. In this metaphor, a scale for measurement constitutes a whole, and the point of the scale where the measure is placed constitutes a part of the scale. Thus, we can refer to the beginning, the middle, or the end of a scale, a high or low level in the scale, a point in the scale, or level 0, 1, 2, 3, etc. in the scale. Examples of the SCALE METAPHOR are very frequent, since a lot of phenomena are measured with scales (temperature, distance, height, speed, length, weight, depth, wavelength, size, volume, rpm, rate, rhythm, humidity, pressure, latitude, astronomical units, age, value, propulsion, percentages, noise, capacity, density, etc. as well as time), as we see in the following examples:

> *...But the Communists aided the Pathet Lao at an even faster rate. (A04:55)*
> *Besides the well-known hydrogen line at 21 cm wavelength, the spectra of extraterrestrial radio sources may contain sharp lines ... (H11:19)*

Mrs. Albert Quell is in charge of admittance for the dancing at 9 P. M. (A18:33)

The SCALE METAPHOR gives origin to expressions that indicate a certain quantity of something, since quantity is also a measurable magnitude. Therefore, idiomatic expressions like *at least, at most, at large*, are found, and their variants *at the least*, *at the very least*, etc. Other idiomatic expressions indicate a part of any type of scale like *at best* and *at worst* which indicate locations in a scale of goodness. Coincidence with temporal measurements are expressed by idioms like *at first*, and *at last*, and variants of these like *at the very first*, *at long last*, as well as by the standard expression 'at – o'clock', as illustrated above. Examples:

Moving past the presidential viewing stand and Lafayette Square will be at least 40 marching units. (A08:26)

But they, naturally, kept his secret well, and the public at large knew only of a great excitement in musical and court circles. (K08:99)

Table two shows operating cost data of state vehicles selected at random. (H04:88)

At best only an approximation could be arrived at. (D14:16)

Caught at last, he was sentenced to prison. (F08:37)

The SCALE METAPHOR prompts the use of *at* with words that do not denote a measurement themselves but the name of the magnitude that is measured. Hence the use of *at* with the names of magnitudes when no explicit, but implicit measurement is meant, in collocations like *at + height, speed, pressure, rpm*, etc. Some of these uses are highly conventionalised, so that we can speak of idiomatic expressions like *at length* (to mean 'more than expected or necessary'), *at a distance*, or *at any rate* (to mean 'it does not matter how'). Examples:

...which should take place in the earth, so that man, ceasing at length to live in sin, and dying to it, might live to God. (D04:54)

They mounted up and rode slowly behind the others at a safe distance. (N02:146)

At any rate, it shows us how immaterial we are. (D13:58)

Common uses of the numerical SCALE METAPHOR in colloquial speech are expressions of amounts of money like *at + cost, at + fee, at + price, at + tax*, *at + salary*, and other

expressions that should indicate an amount of money – explicitly as such an amount, or implicitly. Example:

> *The bill is designed to provide a special schooling for more deaf students in the scholastic age at a reduced cost to the state. (A02:18)*

Likewise, the numerical scale is used to refer to places identified by means of correlative numbers, like addresses, or streets. Example:

> *In addition to these activities, the NAEBM, with headquarters at 420 lexington [sic] Avenue, New York City, ... (E06:77)*

c) *Search for contiguity achieved/achieved coincidence(sense 2-3).* Specialisation of meaning takes place with respect to sense 2a and sense 3, so that the conceptual image schema can be further transformed into sense 2-3 if coincidence is in fact achieved. In this sense, the end of the path is focussed on. This sense can thus be predicted in the presence of verbs like *arrive, come, place, put, set,* etc. with which *at* may appear in prepositional verb constructions. The conceptual distance is reduced between those senses for which the kinetic axis of interaction is more salient and those senses where contiguity is more salient. It can be illustrated with the following examples from the BC:

> *..., the band arrived at a small clearing,... (B25:61)*
> *Place sleeve seam at center underarm and center of sleeve cap at shoulder seam. (E15:147)*

6.3.3 Functional configuration senses

Finally, from the conceptual image schema, functional space – social space – can be profiled, and the relation of functionality, i.e. canonical interaction, between trajector and landmark is highlighted. I would include all functional uses of *at* under one sense, which may receive the denomination of *operation.*

a) *Operation* (sense 4). The canonical interaction is conceived of as use, manipulation or attempt to affect the landmark in some way. Force-dynamic configuration and topological relationship remain in the background. These can provide an element for contrast with other lexical units that may appear in the same contexts, i.e. where functional relationships between the participants are predominant semantically. Here, landmarks designate places where certain people are to be found doing certain specific activities, or participating in certain events, for which the place is conceived. Landmarks are thus usually buildings, or public places. Trajectors are the people who use, manipulate, or affect them, or simply operate in a certain manner in relation to them. Trajectors may also be concepts which denote the activities that are carried out by those people, or the events that these activities constitute, which usually take place in public places or buildings. This semantic specialisation of the conceptual schema is illustrated in figure 6.6.
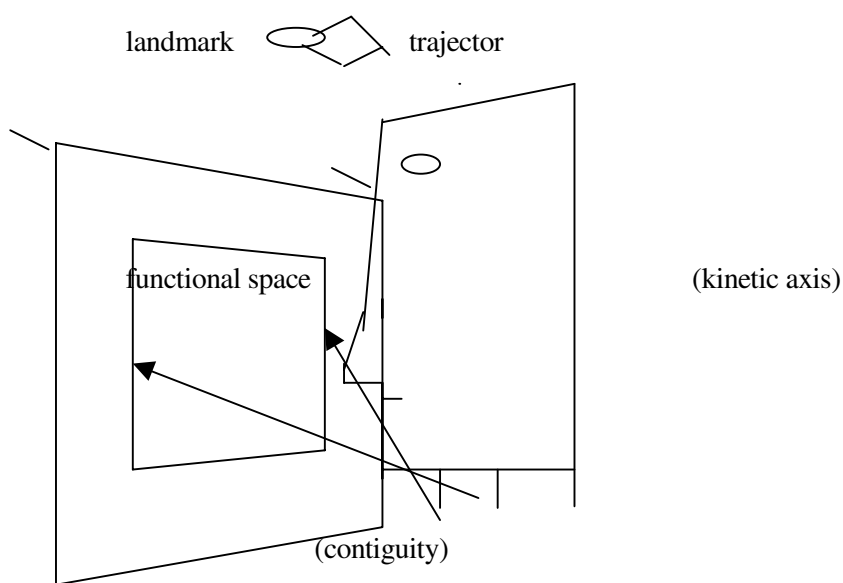
Figure 6.6: Operation

The lexical unit *at* adopts this sense in situations construed according to any of the following patterns, where a type of people, classified according to their function, operates typically or canonically in relation to a particular place, which is conceived for that particular purpose or function:

1) Actors, dancers, orchestras, companies, etc., and their audiences, who perform in buildings or other places which have been designed for that purpose, namely, theatres, auditoriums,

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halls, cinemas, playhouses, opera houses, etc., or parts of them, such as the stage, the screen, the arena, etc. Not only are those concepts that denote human beings possible trajectors, but also their actions and attitudes, as well as the concepts that denote the events which these actions constitute, like plays, concerts, performances, films, representations, premieres, etc., or the objects and equipment typically used for it. Example:

Miss Sutherland first sang Lucia at Covent Garden in 1959. (C02:49)

2) Sportsmen, teams, players, and their audiences, as well as their actions, activities, or attitudes, i.e. games, matches, races, competitions, desire to win, etc. in relation to the place they are carried out *at*, like stadiums, race circuits, sports halls, courts, rings, etc., or parts of these, such as the track, the lawn, etc. Example:

Hansen will engage in his first workout at Miami Stadium prior to the opening tomorrow night of a two-game weekend series... (A11:42)

3) Doctors, nurses, and other types of personnel, and their patients or guests, as well as their equipment, actions, and activities, or the events that these constitute in relation to the places where they typically occur, namely, hospitals, health centres, etc., or parts of these like the operating theatre, etc. Example:

...as time passes the demand for medical care at VA hospitals will grow proportionately as age fosters illness. (B15:86)

4) Professors, teachers, researchers, faculty and other types of personnel, etc. and students, as well as their actions, activities, and the events these constitute, in relation to the places where they are expected to occur, like schools, universities, research institutes, conservatoires, foundations, etc., or parts of these like classrooms, laboratories, etc. Example:

I am a sophomore at Mount Pleasant High School. (B15:42)

5) Workers, managers, directors, etc. and their clients, as well as their actions, activities and the events these constitute, in relation to the places where these typically occur, like a

company, a factory, a shop, a mine, etc., or parts of these like offices, assembly lines, etc. Examples:

> *The colored people are getting employment at Kent House.... (K04:95)*

6) Priests, monks, nuns, and other members of the clergy, and their parishioners, as well as their actions, activities, and the events these constitute, like services, mass, weddings, etc., in relation to the places where these are carried out, such as church, cathedral etc., or parts of these, like chapels, etc. Example:

> *...And don't tell me you didn't at church Sunday. (P03:63)*

7) Waiters, chefs, cooks, room service, maids, receptionists, and other types of personnel, etc., and their clients, as well as their actions, activities, or the events these constitute, like eating, having a meal, or spending a holiday, in relation to the place it usually happens, such as restaurants, cafés, hotels, resorts, motels, etc. Example:

> *The dinner will be held at the Hotel Pierre. (A14:53)*

8) Ships, sailors, fishermen, submarines, etc., as well as their actions, activities, and the events these constitute, like fishing, coastal watching, etc., in relation to the place these are to take place, typically the sea. (where *sea* is culturally conceived of as a place for human activity). Example:

> *Additionally, on the many ships at sea and in the smaller naval stations,... (H10:65)*

Here again, human activities and social events occur in the trajector position where they stand metonymically for the people who perform them. Likewise, institutions stand for buildings in landmark position, where buildings are understood as artifacts, if a reference to the central sense is called for. Other patterns are less frequent but they follow the same semantic criteria, for example, military at their locations, sellers of all kinds and their buyers at their shops, painters and paintings at galleries, dwellers at a residence, etc.

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b) *Rough coincidence/unspecific function* (sense 3-4). From the contiguity and operation senses, a new sense can be derived, which may be called *rough coincidence/unspecific function* (sense 3-4). The transformation now consists of the blurring of the boundaries of the landmark, in such a way that the trajector may, though not necessarily, be subsumed within the space of the landmark, as illustrated in figure no. 6.7 below.

Topological configuration and operational status are relevant here. In fact, the conceptual distance between contiguity and functional senses is reduced. It should be noticed that the participants are construed as being of the same scale. This requires that the scope of predication of the landmark is not too large as compared to the scope of the trajector. That constraint explains why the landmark of *at* is very seldom a concept that denotes large expanses, such as countries, islands, and so forth.
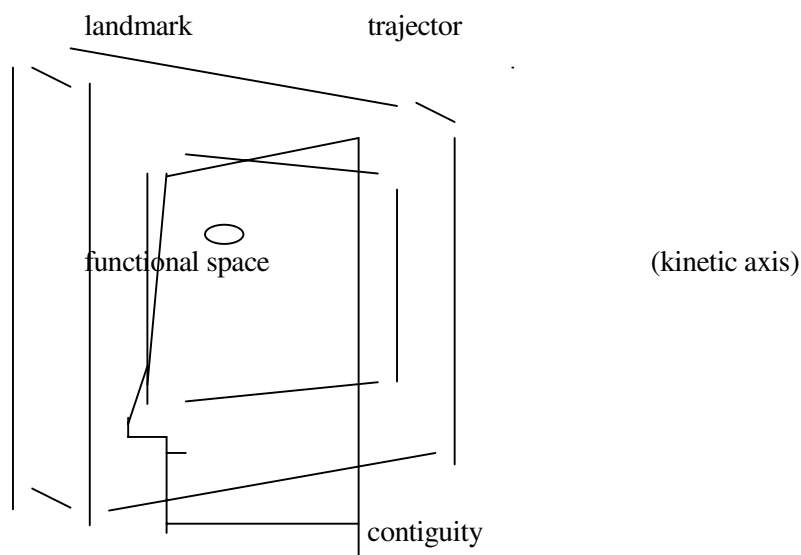
Figure 6.7: Rough coincidence/unspecific function

The landmark is thus usually the name of a place, building, town, city, small piece of land, or small island. Accordingly, the trajector is human or some kind of social or institutional activity, event, or entity, which metonymically stands for the people who perform it or participate in it. Thus, the trajector is not only physically contiguous to the landmark, but is also performing some action, carrying out some activity, or participating in some event or process for which the location stated by the landmark is especially relevant. An illustration is offered in the following examples:

...another Big Four summit session at Paris... (A34:18)

Player gradually increased his lead over Palmer in winnings and added one more
tournament victory at Miami. (A38:42)

...you can enjoy festivals for grapes at Sonoma, Calif... (C15:57)

Goldberg fell into line with Mr. Hodges' appraisal, though there has been some
reluctance to do so at the White House. (B05:65)

In spite of the reduction of conceptual distance, 'functional space' aspects are not fully profiled, because places that appear as landmarks are not specifically conceived for a particular function or purpose, which is canonically associated with the trajector. At the same time, the people, events, activities, etc., which act as trajectors are not particularly expected to be, act, or happen at those places. Even so, the meanings of these trajectors have a strong human component. On the other hand, the conceptual distance with respect to force-dynamic aspects of the conceptual schema is rather remarkable, since the *rough coincidence* sense does not indicate any change in the relationship of contiguity whatsoever.

6.4   A radial category for at

The various senses of the polysemous unit *at* have been illustrated with examples in the previous section. The *primigenial sense* was hypothesised in section 6.2. As a criterion for choosing that first sense (sense 1), perceptual considerations were taken into account. Topology, force-dynamics, and function show a fairly complex array of possibilities for meaning. On the other hand, a diachronic perspective has been adopted, assuming the primigenial sense to be the first usage which children become familiar with in early childhood. Further senses are assumed to have appeared later in linguistic development. So, the more peripherally a sense is represented in the network, the later it is assumed to have been acquired by native speakers. At the first level of specialisation – i.e. senses directly linked to the central schema (2a, 2b, 3, 4) -, the specialisation of *at* takes place by simple highlighting of one of the perceptual aspects. Double highlighting occurs for certain senses like for 2-3 and 3-4. Other procedures are employed such as blending spaces, for sense 2aρ, or semantic bleaching for 3α. The procedures of semantic bleaching and double highlighting

are reverse. Due to double highlighting of both force-dynamic aspects (directionality) and topological aspects (contiguity), sense 2-3 implies a reduction of the conceptual distance between groups 2 and 3. On the contrary, semantic bleaching of both functional and force-dynamic aspects causes a remotion of sense 3α towards the periphery. In figure 6.8, it can also be appreciated how perceptual aspects – topological, force-dynamic, and functional – mark conceptual regions. These conceptual regions are not separate, but merge into each other, so that mixed senses may appear. For the same reason, senses in one region are more or less related to other senses depending on their location with respect to other regions. Therefore, the extension from one sense to another is gradual, and it is so to the extent that many instances from real speech and writing are of problematic classification. Finally, the network represents an idealised mapping of adult usage, since the corpus analysed corresponds to situations where language is used by adults.
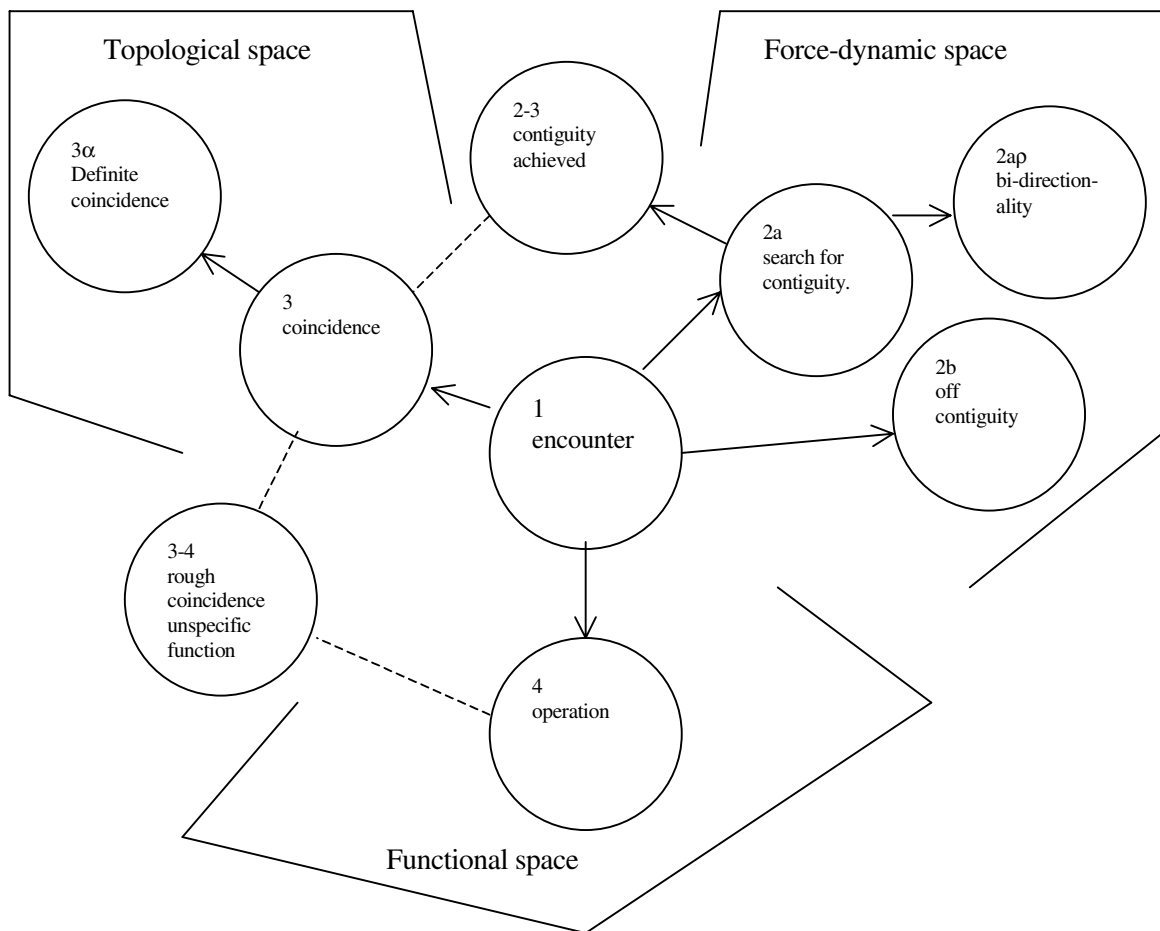
Figure 6.8: Radial category for *at*

6.5   On the search for a prototype

Due to diachronic development, the conceptual schema and the prototype or prototypes may not coincide. They differ when one of the peripheral senses becomes most frequent and entrenched in adult speech. High frequency of a sense makes it more prominent, more conventionalised, and more unconsciously assumed to be the *central sense,* which may lead linguists to identify it with a hypothetical *core sense*. Though the primigenial sense illustrated by the basic image-schema (cf. 6.2) may be the prototype in child speech, there is a progressive shift towards more metaphorical and abstract language in adult speech and writing. The fewer perceptual aspects highlighted, the more abstract a meaning becomes. In the analysis of *at* this is the case with respect to senses in group 3, where contiguity of trajector and landmark is profiled, i.e. the physical space senses. If we include temporal uses within this group, given that they are metaphorically mapped from topological space, instances classified as group 3a and 3aα amount to a 47.18 % of the total. For the establishment of a prototype, if one looks at the sense with a larger number of family resemblances instantiated, one certainly would adopt sense 1 as represented by the conceptual schema. But if *cue validity*[44] becomes a central criterion, contiguity (topological space) shows the highest degree. In addition, contiguity is the source for the most frequently used metaphorical usages of *at,* including the temporal usage, in adult speech and writing (these include numerical measures, scales, and, by further extension, prices and street numbers). Metaphorical occurrences outnumber instances referring to bodily experienced domains. Absolute frequency scores give the greatest prominence to metaphorical usage of sense 3aα, with 539 instances (24.08 % of the total). Table no. 1 shows absolute frequency and percentage of global senses, 1, 2, 2-3, 3, 3-4 and 4, on the total corpus analysed in this work. Tables no. 2, 3, 4, and 5 show frequencies and percentages of metaphorical domains per sense (temporal uses are included).

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[44] Cf. section 3.2. See also Mervis & Rosch (1981) and Rosch (1981) for the notion of *cue validity*.

Table 6.1: Absolute frequencies and percentages of *at*-senses.

SENSE	ABSOLUTE FREQUENCY	PERCENTAGE
1 schema	277	12.38%
2a search for contiguity	362	16.18%
2b off contiguity	85	3.8%
2-3 achieved contiguity	29	1.30%
3 coincidence	396	17.69%
3α definite coincidence	660	29.49%
3-4 rough coincidence	171	7.64%
4 operation	180	8.04%
unclassified	78	3.48%
TOTAL	2,238	100%

Table 6.2: Absolute frequency of senses metaphorically extended from the conceptual schema and percentage relative to sense 1.

EVENTS ARE ARTIFACTS		ACTIVITIES ARE ARTIFACTS		STATES ARE ARTIFACTS		CAPACITIES ARE ARTIFACTS		PROCEDURES ARE ARTIFACTS	
FREQ.	%	FREQ.	%	FREQ	%	FREQ.	%	FREQ.	%
97	35%	32	12%	13	5%	4	1.5%	2	0.75%

Table 6.3: Absolute frequency of senses metaphorically extended from sense 2a and percentage relative to that sense:

CONDUIT METAPHOR		SEEING IS DIRECTING		ACTIONS ARE MOVEMENTS	
FREQ.	%	FREQ.	%	FREQ.	%
26	7.18%	206	56.91%	72	19.89%

Table 6.4: Absolute frequency of senses metaphorically extended from sense 2b and percentage relative to that sense:

CAUSES ARE FORCES		EMOTIONS ARE MOVEMENTS	
FREQ.	%	FREQ.	%
38	44.71%	28	32.94%

Table 6.5: Absolute frequency of senses metaphorically extended from sense 3α and percentage relative to that sense:

TIME METAPHOR		SCALE METAPHOR	
FREQ.	*%*	FREQ.	*%*
122	18.48%	417	63.18%

6.6   Conclusions

The lexical unit *at* appears in prepositional constructions, but never as a conjunction or in adverbial positions. *At* is not used productively as a prefix or suffix of derived words.

The central claim of this chapter is the refutation of a widely held assumption, namely that *at* merely means 'location at a point' or 'general location'. It has been shown that 'location at a point' as such is itself an abstract usage, which can be identified as one of the many different expressions within senses 3 and 3α. Likewise the relation indicated by *at* is not a relation of general location, but a finely specified relation, as has been described by the basic conceptual schema. The determination of a prototype sense constitutes a problematic issue. On the one hand, the conceptual schema shows the largest set of family resemblances, and constitutes the primigenial sense based on bodily experience; it is the first sense acquired by children. On the other hand, the highest degree of *cue validity* conferred by speakers' usage to topological aspects, brings the senses for which contiguity is profiled (3, 3α, 2-3 and 3-4) to amount up to a 56.12% of the instances found in the corpus. These results make the contiguity sense a fair candidate for the prototype.

7.   THE SEMANTIC STRUCTURE OF ON

7.1   Morpho-syntactic usage

For the analysis of the lexical unit *on*, no context discrimination was made from the syntactic point of view, i.e. not only 'NP P NP' constructions, but all constructions in which *on* appeared were considered. This analysis shows that this lexical unit appears in prepositional constructions as described by the grammar (cf. 2.2.1), but it also appears as adverb, as nominal prefix, as adjectival prefix, and as adverbial particle of phrasal verbs. The following morpho-syntactic environments for *on* have been observed:

a) In prepositional constructions: Head of a postmodifier PP in the constructions *NP P NP* and *A P NP,* particle with prepositional verbs, in the construction *V P NP*, head of an adjunct PP in a VP in the construction *V P NP*, disjunct and conjunct. Examples:

> *It was faced immediately with a showdown on the schools, ... (B01:2.)*
> *Your personal guard? You're pretty hard on him. (N05:106)*
> *We congratulate the entire membership on its record of good legislation. (B01:14)*
> *It was on the eve of a momentous U&N& session to come to grips with cold war issues. (B04:3)*
> *On the whole this is an interesting and exceptionally well-written book. (C03:44)*
> *The hall, on the other hand, appeared lifeless and deserted on these long waterfront afternoons (N06:77)*

b) Nominal prefix (*onrush, onset, onslaught*). Example:

> *The following summary, [...] is an example of one way of interpreting the 42 figures constructed from onset... (J13:58)*

c) Adjectival prefix (*oncoming, on-site, on-stage, onward*). Example:

...there were actually a dozen occasions when oncoming drivers stopped an entire lane of traffic to permit me to pull out of an impossible side street (B09:119)

d) Adverbial particle in phrasal verb constructions. Example:

'You talk so well, Carla', he went on. (P12:24)

e) Adverb in adverbial function in the VP. Example:

Only recently new 'holes' were discovered in our safety measures, and a search is now on for more. (G03:23)

7.2 *Conceptual schema for on*

7.2.1   *General conceptual schema*

The initial hypothesis in this chapter is that children first form a concept based on their experience with objects in general, and on the contact of their bodies with those objects. The initial *impetus* for the gestalt of *on* as a new spatial relational concept is based on bodily experience and on perceptual space (Bowerman, 1996, 1997). To begin with, all objects in any situation have surfaces, and these surfaces are perceived all the time, no matter how the objects are construed by the speaker in a situation at a particular moment. Therefore, the mere surface cannot be the basis of a concept which has to be in opposition and contrast with other concepts. In this case, the concept *on* cannot consist just of the surface configuration of the landmark. The reason is simply that all landmarks of all relational concepts have perceived surfaces (if we talk of the physical domain). For the *conceptual schema* of this lexical unit the following configuration is posited:

1.- The trajector of *on* is an entity that can be conceptualised as capable of self motion-control, or whose motion is controlled by using the landmark. The trajector's resting side faces or is directed towards the landmark in order to achieve that control. This is

accomplished through contact of the resting side of the trajector and the outside part of the landmark. Therefore, the trajector uses the landmark for self-support, or the situation is construed in such a way that the trajector finds a rest status, a standing position, or its natural or canonical position, by using the landmark as a tool for support, i.e. motion control. In the canonical support situation, the trajector benefits from the relationship expressed linguistically by *on* so as to avoid falling down. Thus, in the expression *the lamp is on the table,* the trajector position, where *lamp* appears, puts emphasis on the fact that motion control relative to the lamp is maintained by means of resting, or standing, with the help of the table. Other relational concepts like *over* or *above* do not convey this idea of motion control or support.

2.- The landmark is an object that offers an accessible side for use as support by the trajector. This side is an external part, the outside of the object. The prototypical case consists of the upper horizontal surfaces of objects, or the ground as such, since these provide easy support to other entities, but this is by no means the only possibility. The relationship may be construed as trajector and landmark in some natural or culturally acquired position in relation to each other, or adopting an attitudinal position, i.e. search for support, e.g. *a man on a stick, to sit on a chair*.

3.- According to the force-dynamic configuration of the relationship – kinetic space –, trajector and landmark positions in relation to each other define a common axis along which their relationship can adopt a certain directionality. For the *on*-relation, that axis is defined by the resting side of the trajector, as well as by its orientation towards the landmark. Thus, that axis is prototypically the vertical axis with respect to the human canonical position as standing on the ground, since the human resting side is defined by the soles of the feet. So, the motion axis (the directionality of relative positions) is defined by a line which is prototypically perpendicular to the ground. The force exerted by the trajector is prototypically exerted downwards. Therefore, the prototypical direction of the movement along this vertical axis will follow this downwards pattern. If the trajector is not resting according to this direction in the actual construal of the relationship, a rotation of this imaginary line may occur. The resulting axis is no longer vertical, since it must preserve its relative perpendicularity with regard to the resting side of the trajector. So, in the expressions *a fly on*

the ceiling, or *a fly on the wall*, the axis has been rotated, but the relative position of the fly still remains as with its resting side towards the ceiling or the wall.

4.- According to topological configuration, trajector and landmark bear a relationship of contact, or tend to be in a relation of contact. This contact is always conceived of as in relation to the outside part of the landmark, and the resting part of the trajector. This feature may help to grasp nuances of meaning such as the *tablecloth on the table* versus *the tablecloth over the table*. The first expression requires contact, whereas the second one requires complete covering. Thus, on the one hand, a cloth on a table may be folded up, i.e. may not cover the table, and on the other hand, a cloth over a table may be hovering without contact with it, but covering it anyway. Though the usual situation in the world is that tablecloths are at the same time on and over tables, and people may use either expression to refer to that situation, this fact does not imply that both expressions are synonymous. Each one of them profiles different topological aspects, depending on alternative human construal of that situation.

5.- According to functional configuration – social space -, interaction between trajector and landmark is expectable. Functionally, the trajector holds control of the situation. It may be prototypically self-control, or motion control, but this control may be extended to the landmark. Thus, a fly may be *on your hand* or *in your hand*, depending on who is exerting motion control of the trajector (the fly). If one of the participants is to hold control over the other, the controller will be always the trajector of *on*, and the landmark will be the 'controllee'.

6.- Trajector and landmark present clearly recognisable *active zones* with respect to the meaning of *on*. These *active zones* roughly coincide with the sides they offer each other, i.e. the resting side of the trajector and any of the external sides of the landmark.

7.- Trajector and landmark are conceived of as in the same scale. Thus, a situation is not construed where a molecule is *on* a table. However, the scope of predication of the landmark may be larger, as compared to the scope of the trajector, than for the lexical unit *at*. This allows predications like *a plant on the planet.*

As a label for this *conceptual schema*, which is assumed to be easily perceived in early childhood, the expression SUPPORT will be adopted here. From the landmark point of view, the trajector is a burden, and from the trajector point of view the landmark is a supporting entity. Strictly speaking, numbers 1 and 2 above specify trajector and landmark configurations as contextual elements of this lexical unit, whereas numbers 3 to 7 specify the meaning of *on*, i.e. the ways in which *on* determines the relationship between trajector and landmark, according to the *conceptual schema*. Here again, as occurs with regard to the meaning of *at*, all reference to the geometric configuration of the landmark has been avoided. The *conceptual schema* is instantiated in whatever expressions conveying that some entity offers support to other entities. Examples:

Check fit of lid on jar; if inner lid is too big, trim to fit,... (E15:72)
He preferred sleeping in bed with his head on a pillow. (C10:17)
A tribe in ancient India believed the earth was a huge tea tray resting on the backs of
three giant elephants, which in turn stood on the shell of a great tortoise. (C13:1)

This *conceptual schema* determines sense 1 of the lexical unit *on*, and can be graphically represented as illustrated in figure 7.1:
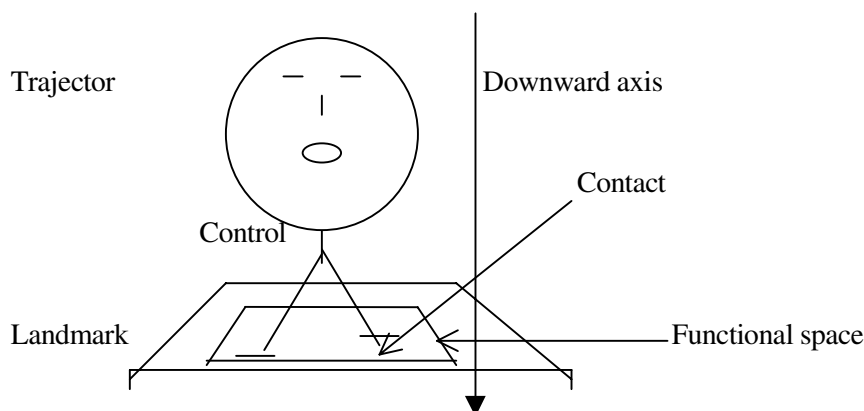
Figure 7.1: Basic conceptual schema for *on*: Support

The human shape on the figure is not literal. It just implies that the functional relation of control resides in the trajector rather than the landmark. The landmarks may correspond to more or less conventional collocations like the following cases illustrated with examples from the BC:

a). Geographical locations like *mountains, hills, rocks, ledges, knolls, elevations in general, islands, peninsulas, promontories, capes, the coast*, etc. Examples:

> *The President spent much of the week-end at his summer home on Cape Cod...*
> *(A03:13)*
> *Can you visualize being stranded with him on a desert island for years and years*
> *and still find him fascinating? (B08:88)*

b) The ground in general, or words denoting pieces of it like *floor, battlefield, plain, land, campus, court, mound, terrace, prairie, site, moors, terrain, plot, the grass, lawn,* etc. as well as *a farm, reservation, property*, etc. as a piece of land. This sense includes the ground as support for life, as well as the earth, the world, planets, and other heavenly bodies as support, for life or just materials or objects in general. Examples:

> *Only 11 senators were on the floor and there was no record vote (A03:86)*
> *Enough of his life was spent there on the field for him never to like watching the*
> *game as a spectator in the crowd. (B14:24)*
> *They plan to become county people who know the proper way to terminate a fox's life*
> *on earth. (C01:86)*

c) Bodies of water, as support for ships or other objects, as well as living beings which remain on the surface of the water. Examples:

> *The Queen Mary has long been a symbol of speed, luxury, and impeccable British*
> *service on the high seas. (B06:67)*

d) *Paths, roads, railways, tracks, pavements, driveways* as supporting paths for travelling persons or machines. Examples:

> *Canada alone has been somewhat out of step with the Oslo attempt to get all the*
> *allied cars back on the track behind the NATO locomotive. (A04:9)*
> *Pat Seerey of the White Sox and Rocky Colavito, then with Cleveland, made their*
> *history on the road. (A13:75)*

e) Vehicles or means of transport, when they are construed as fulfilling a function of support for human beings or merchandise (*cars, trains,* different kinds of *ships* and *boats, lorries, trams, wagons, motorcycles, bicycles, aeroplanes*, etc.). Examples:

> *...also wrote the book [...] a saga of life on a cruise ship ... (C09:62)*
> *I stayed on the car for a few minutes... (E13:52)*
> *It is a simple task to haul a boat fifty or one hundred miles to a lake or reservoir on*
> *the new, light, strong, easy-to-operate trailers... (E06:14)*

f) Other artifacts or objects conceived of as for support of human beings or other entities (*chair, stool, bench, table, bridge, stand, stage, counter, deck, platform, wheels, casters, shelf, pedestal, bed, bunk.* etc.). Examples:

> *Also, salt water fish is on the table once a week. (F04:77)*
> *...he had a small audience of small children right on stage with him (C08:58)*
> *Nordmann was sitting on the Bill's bench doing what he could to help ... (A15:65)*

Certain idioms may be explained as having their origin in the *on* relation as expounded here. So, *Wh- on earth?* referring to everything on the Earth, as a hyperbole; *on the spot,* with a temporal sense, and implying "not enough time to move from the spot one is on", i.e. right away or immediately; and *on a+A.+basis* to introduce the main criterion which guides action, attitudes, policies, etc. The expression *on top of* is in a process of becoming a new preposition with a more specific meaning than *on*. Here, the landmark for the *on* relation is the top of an entity, so that the landmark for the new preposition is the entity itself as a whole. Thus, the central schema for *on* may correspond, and be similar semantically, to *on top of*, though only for those landmarks that have a distinct top (*on top of the mountain* is not necessarily the same as *on the mountain*). Other senses of *on* differ considerably. Accordingly, the contrast is present in examples like *on top of the car* versus *on the car, on top of the road* versus *on the road, *on top of the sea* versus *on the sea, on top of the page* versus *on the page, on top of the wall* versus *on the wall,* etc. Examples:

> *They now lead Louisville by a full game   on   top of the American Association pack..*
> *(A13:4)*

Why on earth did I send him off to work? (L13:33)

Soviet leader must be tempted to let things ride – a course that would appear to cost him

little on the spot, but would bog Washington in a tactical mess. (B02:67)

..at least one hotel has been quietly taking reservations on a non-racial basis. (B09:89)

7.2.2   Shifts of the conceptual schema

The *conceptual schema* may suffer certain modifications due to perceptual shifts of perspective or profile. Thus, three further construals of the *conceptual schema* have been found:

a) Rotated schema: (sense 1a) A non horizontal surface is the supporting side of the landmark. Force downwards is the attribute that makes *on* contrast with *against* (force sideways). Contact is still present and the trajector holds on motion-control of itself. Therefore, the relationship SUPPORT is utterly present in the contexts where a rotated conceptual schema of support is instantiated (see figure 7.2).
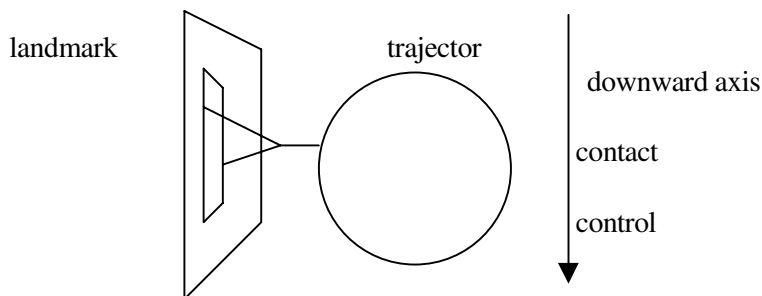
Figure 7.2.: Rotated schema

This sense occurs with nouns referring to entities that offer non horizontal external parts for support of other entities, such as *walls, trees, the human body, columns, hinges, doors*, etc., where verbs of the *hang* type are the prototypical verbal context. Examples:

Pictures of her in more glamorous days were on the walls. (F09:112)

There are a great many bishops who have never had a cross on their bosom,...
(D05:53)

b) Axial support (sense 1b): It may be a consequence of a shift produced on both sense 1 and 1a, whereby the support is an axis (*needle spit hub, nail, line*) which sustains the trajector, as *a ring on a finger* (see figure 7.3). Examples:

> *... determining what makes the earth rotate on its axis...(E08:5)*
> *One medium saw two sheets flapping on a line.... (F12:89)*
> *A wheel squeaked on a hub, was still, and squeaked again. (G14:53)*
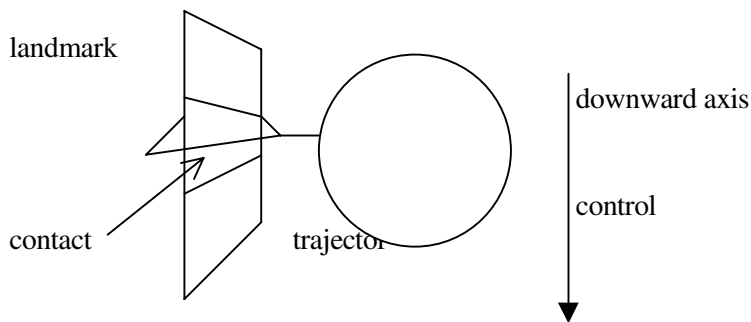
Figure 7.3: Axial support

c) *Part of trajector is landmark* (sense 1c). Thus, landmarks are parts of buildings, parts of the human body (*legs, heels, stomach, toes*, etc.), and in general, that part of something which is in contact with the actual supporting place (see figure 7.4). Examples:

> *The economy seems to be sailing along on an even keel... (B05:56)*
> *She remained squatting on her heels all the time we were there; (G04:111)*
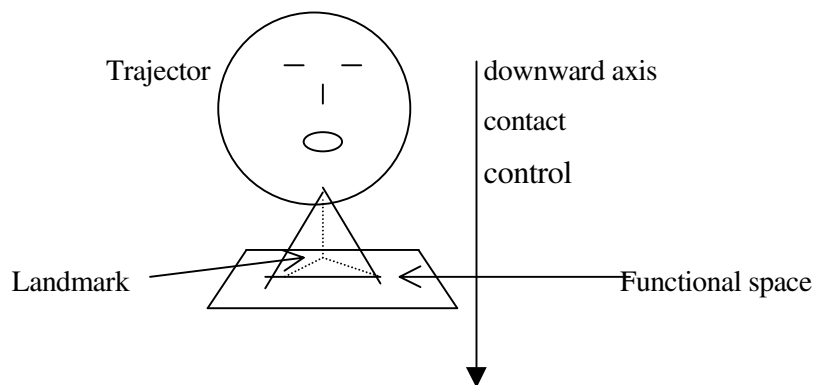
Figure 7.4: Part of trajector is landmark

This sense gives rise to conventionalised expressions like *on foot* (walking) or *on one's feet* (standing). Examples:

> *Rat-face at the counter was on his feet. (L03:26)*

7.2.3   *Extensions of the conceptual schema*

7.2.3.1 Metaphors

There are many domains of thought and knowledge which are conceptualised in terms of the *on*-relation, as it appears in the *conceptual schema*. In those expressions that reflect a metaphorical mapping based on the predicate *on*, English may adopt two perspectives, either that of the trajector or that of the landmark. From the trajector's point of view the landmark is conceived of as support. On the other hand, from the landmark's point of view, the trajector is conceptualised as a burden. The following metaphors have been found:

1.- RESPONSIBILITIES are BURDENS: By virtue of this metaphor human beings are conceived of as supporting their responsibilities, as if these were physical burdens. Example:

> *In 1958, the Conference endorsed birth control as the responsibility laid by God on*
> *parents everywhere. (F15:61)*

2.- ARGUMENTATION is a BUILDING: According to this metaphor, conclusions in discourse or thought are built on some arguments, which in turn are based on premises, assumptions, presuppositions, etc., which provide a 'basis' for them. Example:

> *...the mutual love of the spouses is the secondary and subjective end. This conclusion*
> *is based on two propositions:... (F15:34)*

3.- CAUSES are SUPPORT (for a decision, for a result, for an action, etc.). The cause which produces an effect or result may be expressed linguistically as the base that supports it.

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Prepositional verbs like *blame on* may be used with this sense of *on*. Collocations like *on impulse,* or *on charge* occur with this sense, indicating a cause. Examples:

> *Varani has been fired on charges of accepting gifts from the contractor. (A09:8)*
> *Rep. Berry, [...] got elected on his advocacy of betting... (A02:28)*

4.- HELP is SUPPORT: Help offered or received from people or other entities is expressed as the support for action, development, etc. Prepositional verbs like *lean on, count on, rely on, depend on, back on, hang on, hinge on, be based on*, etc. occur with this sense. Examples:

> *The panel's action depends on the return of Representative J. W. Trimble, (A07:42)*
> *They count on the aid of the neutral countries.... (A04:26)*

5.- RESOURCES are SUPPORT: By using the lexical unit *on*, those resources used to carry on some action or process are conceived of as a support. Certain prepositional verbs are used according to this metaphor like *draw on, live on, feed on, leech on, bet on, trade on, sustain somebody on, nourish on, capitalise on, profit on, dine on, fatten on, gorge on*, etc. Examples:

> *The glass may seem trivial but Communist official hooliganism feeds on such incidents unless they are redressed. (B02:17)*
> *...he is not likely to be duped by extremists who are seeking to capitalize on the confusions and the patriotic apprehensions of Americans. (B04:82)*
> *But the brigadier dines on the birds with relish. (C01:94)*

Idioms: This metaphor allows for certain idiomatic usages like *on someone's own*. Examples:

> *...the crisis created by the elections which left no party with enough strength to form a government on its own. (A09:95)*

6.- Negative feelings and other PSYCHIC PHENOMENA are BURDENS for people. Example:

> *...it narrowed to her flesh and the sound of it snarled and cracked, settling its own cruel demons on her shoulders while she stood as unchanged, as dark and motionless as ever,... (P13:57)*

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7.- TOPICS are PIECES OF GROUND (< Thought is space). The mapping of topics onto pieces of ground would correspond to the general metaphor THOUGHT is SPACE. There are many prepositional verbs that respond to this pattern, like *speculate on, deliberate on, speak on, comment on, lecture on, write on, inform on, report on, read on, consult on, agree on, insist on*, as well as the corresponding nouns, plus others like *ignorance on, research on,* etc. In turn, the topic is expressed with words like *topic, matter, subject, theme, issue*, etc. Examples:

> *The grand jury commented on a number of other topics.... (A01:7)*
> *and I challenge Mitchell to tell the people where he stands on the tax issue. (A06:25)*

8.- CONDUIT metaphor: Words and language are support for meaning, and carry it over to the listener. Examples:

> *when the work is offered in the theatre and there can be other effects to relieve the burden on the author's words. (C14:71)*
> *...the words of the Lady Da took on very remote meaning. (M06:137)*

9.- MEDIA metaphor: Communication (words, language,...) travels supported by, radio waves, sound waves, TV waves, cables, telephone line, internet, etc. Examples:

> *Advertisers have discovered the tendency of Negroes to shop for brand names they have heard on stations catering to their special interests. (C12:30)*
> *IN recent days there have been extensive lamentations over the absence of original drama on television. (C14:60)*

10.- The AIR is a SUPPORTING MEDIUM. Examples:

> *#WHISKY ON THE AIR# (B02:29)*
> *...participate in community improvement projects, not simply serve on the air. (C12:16)*

11.- PROCESSES are PATHS. A process is understood as a path that somebody or something goes along. (cf.7.2.3.2) Examples:

...as the prelude to a quarrel between the six attorneys representing the eight former policemen now on trial. (A03:2)

But there was terror in the thirties when the Nazis were on the loose and in those days Low struck like lightning. (C05:57)

12. -REASONS are SUPPORT (for a decision, for policy, for a prize, for an action, for an attitude, etc.). Examples:

We congratulate the entire membership on its record of good legislation. (B01:14)

...to an industry that prides itself on authenticity, he urged greater realism. (C02:91)

Certain idioms may express reason for action like *on order*, *on request*, *on the score*, *on (the) grounds*. Examples:

...with the addition of the .375 and .458 to the list of Model 725's. These are made on special order only, in Kodiak grade (about $310),.... (E10:67)

...he was constantly being asked why he didn't attack the Kennedy administration on this score. (A04:38)

13.- EXPENDITURES are BURDENS: According to this metaphor, taxes and other expenditures are understood as burdens which people support. Examples:

One effect of the proposal, which puts a premium on population instead of economic strength (A07:79)

Failure to do this will continue to place a disproportionate burden on Fulton taxpayers (A01:17)

14. SCALE metaphor: This metaphor is present when speaking about magnitudes which cannot be measured numerically but in terms of levels (high versus low, shallow versus deep, general versus particular, etc.), for example the social scale, the political scale, a geographical scale, etc. In this sense, each level provides support for certain phenomena, or the scale may be referred to as a whole. Example:

If you want to raise feed or carry out some enterprise on a larger scale, you'll need more land. (F13:49)

This sense produces collocations like *on + level* that might no longer refer to a scale. Example:

...the goal is the establishment of a new atmosphere of mutual good will and friendly communication on other than the polemical level. (F15:14)

15.- Favourable STATE OF AFFAIRS is SUPPORT for further action. Examples:

Since the validity of all subsequent planning depends on the accuracy of the basic inventory information, great care is being taken... (H06:75)
...of interest costs, heavy when short-term money rates are high, and in freedom from dependence on credit which is not always available when needed most. (H07:37)

16.- LAW is SUPPORT (for action, attitude, etc.): Under the term 'law' other types of norms may be included, such as *religion, regulations, driving rules*, and any system of norms, each with its particular scope. Some idioms like *on principle*, are conventionalised according to this sense. Examples:

For the beatnik, like the hipster, is in opposition to a society that is based on the repression of the sex instinct. (G13:10)
They are non-conformists on principle. (G13:53)

17.- KNOWLEDGE is a BUILDING. This metaphor is based on the conceptualisation of knowledge as something that is progressively built on previous achievements. Examples:

...when the <Lo Shu> seems to have been at the height of its popularity, was based in large part on the teachings of the Yin-Yang and Five-Elements School, which was traditionally founded by Tsou Yen. (D08:41)

18.- THEORIES are BUILDINGS: This metaphor is frequent in the language used to describe scientific theories, or other kinds of theories, to express their constructional character whereby axioms or principles are the base for further theorems, and so on. Examples:

> *... the position of the 'right', as represented by Barth, rests on the following thesis: The only tenable alternative... (D02:60)*
>
> *Dr. Bonnor begins with a discussion of the relativistic theories of the universe, based on the general theory of relativity. (C13:11)*

19.- BELIEFS are SUPPORT. People feel supported by what they believe, religion, ideology, folk theories, etc. O*n* precedes those expressions that refer to beliefs. Examples:

> *A stronger stand on their beliefs and a firmer grasp on their future. (A10:54)*
>
> *But people differ in their religious beliefs on scores of doctrines. (F15:39)*

20.- Positive FEELINGS are SUPPORT: Feelings are referred to as entities on which a person rests with the purpose of good or healthy living. Example:

> *He felt able to end on a note of hope. (B07:44)*

21.- INSTITUTIONS are SUPPORT for action or activity, in the sense that they provide a context which guarantees moral, economic, financial, or other types of support. Examples:

> *He doesn't really need the immense sum of money (probably converted from American gold on the London Exchange) he makes them pay. (C01:79)*

22.- DISEASE is a BURDEN: The presence of illness or disease is expressed in terms of a burden supported by the people affected by it. Example:

> *...closed interferes with normal chewing, so that a child may swallow food whole and put a burden on his digestive system. (F11:41)*

23.- PENALTIES are BURDENS: Judicial penalties and other kinds of punishments are expressed as if they were burdens imposed on people. Example:

You may reclaim your property, and the penalty on Hesperus is lifted. (M03:16)

24.- MAIN COMPONENT is SUPPORT of the whole: The main component of a mixture or complex entity is spoken of as a supporting basis on which the other components rest. Examples:

These widely advertised products, [...] are based on high-sudsing, synthetic organic actives (sodium alkylbenzenesulfonates) (J05:4)
Our last joint venture, <Sainted Lady>, a deeply religious film based on the life of Mother Cabrini .(R03:54)

25.- PHYSICAL PHENOMENA are SUPPORT for measurement values: In scientific language this is a common metaphorical pattern. Values are spoken of as standing or depending on facts. Examples:

...rise to local heat fluxes in excess of **f as measured by the authors − the exact value depending on the arc atmosphere. (J02:9)
...the flux of the smallest particles detected is less than that of larger ones. Being based on so few events, these results are of dubious validity. (J07:47)

26.- MECHANICAL PRINCIPLES are SUPPORT for machine working, and in a wider range, LAWS OF NATURE are SUPPORT for natural phenomena in general. The correct functioning of devices is spoken of as depending on or standing on rules. This could be seen as a second level metaphor derived from the 'LAW is SUPPORT' metaphor, since nature is spoken of in terms of being ruled by laws. Phenomena are then supported by these laws of nature. Example:

With detectors sensitive to three mass intervals and based on a few counts, the second and third Russian space probes indicate that... (J07:46)

27.- A CHANNEL is a PATH. According to this metaphor, particles and other entities travelling through pipes and tubes in the laboratory do it in the same way as people on paths. Example:

The required amount of carbon tetrachloride was distilled into a series of reaction

cells on a manifold on a vacuum line. (J06:27)

7.2.3.2 Metonymy

Only one metonymic pattern has been observed recurrently in the corpus. As a tentative label 'EVENTS ON PATHS are PATHS' is proposed. Metonymy as seen above (cf. 3.5.1; 3.7.1) implies a mapping within a single cognitive domain. Accordingly, when moving along a path people can also think of the event of moving along this path in terms of the path itself. Thus, we can find expressions where the unit *on* is followed by words that express the events of moving on paths, such as *trip, route, ride, hike, tour, walk, voyage, flight, run*, etc. Examples:

Mr. Freeman said that in many of the countries he visited on a recent world trade trip

people were more awed by America's capacity to produce food surpluses... (B05:27)

In Michigan, there is fine color on route 27 up to the Mackinac Straits, while the

views around Marquette and Iron Mountain... (C15:25)

7.3   *Specialisation of meaning*

Further senses can be observed which correspond to the profiling of certain aspects of the *conceptual schema* in a process of partial sanction of the schema. Each new sense may be extended by means of metonymy and/or metaphor.

7.3.1   *Force-dynamic configuration senses*

The force dynamic configuration, i.e. the interaction axis between trajector and landmark, is highlighted as the central aspect of the relation. Other aspects like the topological relation of contact and the functional orientation remain on the background, though still present. Thus, *on* is compatible in context with other linguistic units which express motion along a prototypically vertical axis, as well as the tendency to gain contact or control. The direction of the movement is also relevant, and is determined by the trajector's resting side, as well as

by the landmark's accessible active zone. Further senses are derived from the central force-dynamic sense when the background attributes (contact or control) gain salience.

7.3.1.1 Shifts from the conceptual schema

a) *Movement ending in support* (sense 2). Sense 2 implies that the movement downwards has an end in contact with the landmark, and in a position where the trajector exerts control over itself (see figure 7.5). Verbs like *lounge, deposit, set up, lean, recline, put down, land, lay, put, hang, settle,* etc. are found with *on* in prepositional verb constructions. Examples:

> *The first few days Bob Fogg set his plane down on Towne field back of the State*
> *House when the wind was right,... (F05:41)*
> *Bob Fogg made the first landing on what is now part of the Barre-Montpelier*
> *Airport. (F05:54)*
> *Vernon would tilt his hat over one ear as he lounged with his feet on the*
> *dashboard, indulging in a huge cigar. (E11:63)*
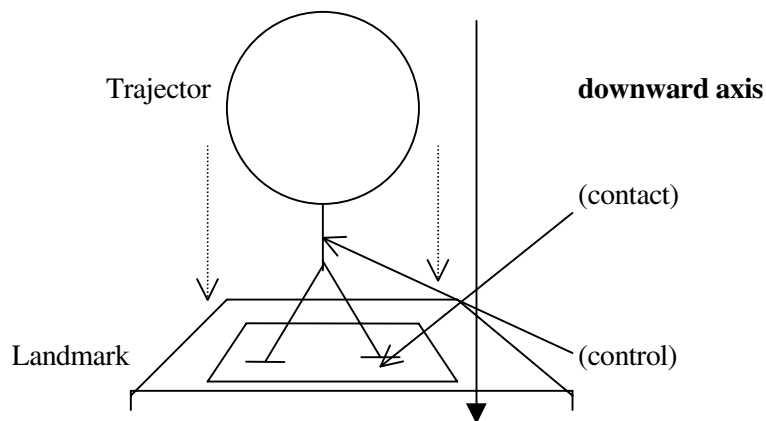
Figure 7.5: Movement ending in support

b) *Movement ending in contact plus control of the landmark* (sense 2a). The situation depicted shows a trajector that carries on movement ending in contact with the landmark, and this contact also implies control over that landmark (see figure 7.6). Verbs like *tread, push, press, pressure, impinge, prey, grasp, step*, etc. instantiate this sense.
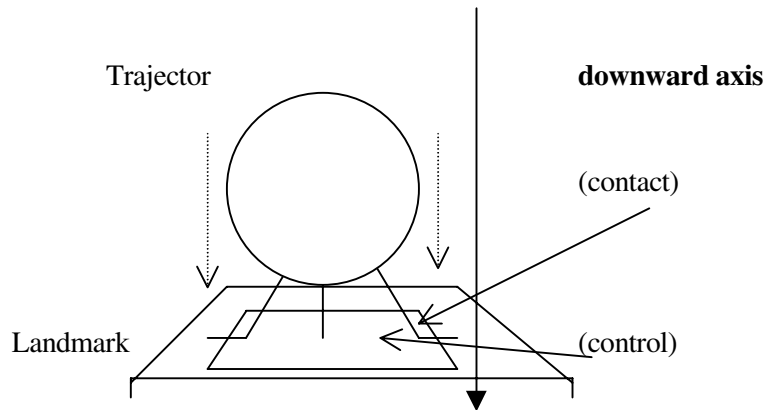
Figure 7.6: Movement ending in contact and control of landmark

Examples:

> *The speed is controlled by pressing on the two brake buttons....(B13:31)*
> *The combination of thin pattern and very tiny pellets makes it necessary to get on the*
> *birds, right now! (E10:65)*

It may occur that certain expressions convey multitrajector movements ending in contact and control of the landmark. For instance, verbs like *get together on, concentrate on*, or *concur on*. The trajector is multiple, but the relation expressed by *on* is still that of sense 2a. Examples:

> *...and concentrate its constructive efforts on eliminating in other parts of Latin*
> *America the social conditions... (A04:44)*
> *Interama, as it rises, will be a living monument to Greater Miami's ability to get*
> *together on worthwhile enterprises. (B04:39)*

c) *Movement ending in contact* (sense 2b). In this case, the end of the movement only implies contact with the landmark, and the attribute of control is not sanctioned (see figure 7.7). This use is found with verbs like *fall, sink, throw, cast, hurl, fling, dash, spit, shed, drip, drop*, etc. Examples:

> *...here in my hand the little chunk of uranium metal that was the heart of the bomb*
> *that dropped on Hiroshima. (D13:10)*

There is still the remote possibility of planetoid collision. A meteor could fall on San Francisco. (G11:44)

When one of the men in the hall behind us spat on the floor and scraped his boot over the gob of spittle I noticed how the clerk winced. (N06:23)
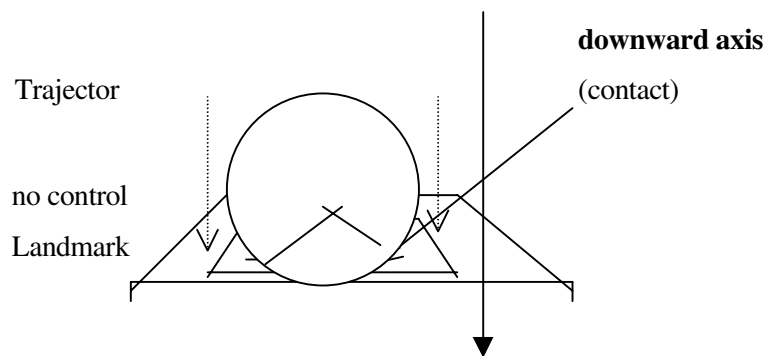
Figure 7.7: Movement ending in contact

Contact may be achieved through a violent impact, with verbs like the following: *beat, strike, smite, punch, hit, bump, bang, thump, tap, slap, pat, clap. rap, knock, kick, hammer, drum, blow, jump*, *splash, smash down, plunk down, thwack, hurtle*, etc. Examples:

I don't think you want to talk to him. You'll probably get a ball bat on the head. (A13:48)

He had taken a carbine down from the wall and it trailed from his hand, the stock bumping on the wood floor. (N02:60)

Dean leaned from the saddle and gave him a mighty whack on the back. (N03:117)

d) *Movement attempting contact and control of the landmark* (sense 2c). This sense implies partial sanction of sense 2a, since actual contact and control are not necessarily implied (see figure 7.8).

This sense appears in context with words that convey an idea of movement, but no contact or control. These attributes seem to be introduced by the unit *on* itself. Adverbial PPs with verbs like *attack, be, march, advance, turn,* etc. respond to this semantic pattern. Examples:

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...inspection system which will prevent Laos from being used as a base for Communist

attacks on neighboring Thailand and South Viet Nam. (A04:25)

But the old man turned on her, jerking the whip from her hand. (P13:42)

True, there had been raids on Naples- (F02:39)
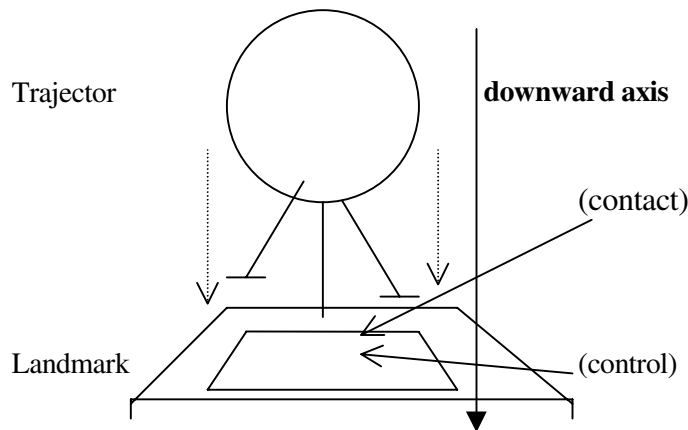
Figure 7.8: Movement attempting contact and control of landmark

e) *Trajector becomes part of the landmark through contact* (sense 2d). The movement of the trajector ends in contact with the landmark, and the trajector becomes part of the landmark. *On* appears in context with verbs like *add on, attach on, build on*, *take on*, etc. Examples:

...he was only 4' 10'' tall and weighed an astounding 72 pounds, and his greatest

desire was to pack on some weight.(E01:12)

Do you love to run up a hem, sew on buttons, make neat buttonholes? (F06:83).

7.3.1.2 Metaphorical extensions of the force-dynamic senses

1.- LIGHT is a FLUID: Light is spoken of as if it were a fluid which is cast on other entities (sense 2b). Other nouns that imply degree of lightness like *shadow, shade, colour, brightness*, etc. may also appear as trajector. Verbs like *shine, cast, beam, reflect, blaze* followed by *on* instantiate this metaphor. Examples:

In any instance, you should determine the exposure according to the type of light which falls on most of the subject area. (E12:55)

...sensitives for a large number of cooperating sitters, trying to throw light on this question of the significance of mediumistic statements. (F12:54)

2.- ACTIONS are DIRECTED MOVEMENTS: Certain gestural actions are carried out by people so that they 'touch' other people in a figurative sense (sense 2b). Thus, verbs like *smile, frown, scowl, laugh, grin, wink* and other verbs followed by *on* may convey that the action is intended to produce an effect on the addressee, as if 'touched' by it. Examples:

...the idiosyncrasies and foibles observed there could be anybody's, and the laugh is on us all. (C09:16)

When the sun came out, Stevie strode proudly into Orange Square, smiling like a landlord on industrious tenants. (K06:151)

3.- SPENDING is POURING: In this metaphor money or other resources are spoken of as if they were fluids poured on the entity purchased or object of pretended investment (sense 2b). Verbs like *waste, spend, disburse, lavish*, etc. are used with *on* in this sense. Examples:

...1962 will be a tremendously "partisan year". Hence the attention they're lavishing on the CDC. (B11:21)

...We spend millions of dollars every year on fortune tellers and soothsayers. (D07:21)

4.- SEEING is TOUCHING: The act of looking is understood as an act directed towards an entity which is touched by the look. This sense occurs with verbs like *look* (prolonged, fixed and intent), *glance, peep, stare, gaze, glare, pore, peer, set eyes on, fix one's eyes on*, etc. The unit *on* follows these verbs when a kind of effect on the landmark is meant, and that effect is produced by the act of looking. The landmark is usually a human being who is affected (touched) by the kind of look (intense, aggressive, fixed, etc.). Example:

...from numerous insiders and from Mr. Kennedy himself; but never from Mr. Nixon, who looked on reporters with suspicion and distrust. (C11:62)

5.- PSYCHIC PHENOMENA are AGGRESSORS. Here, worries and other psychic phenomena are conceived of as external agents that come on people and disturb, or affect, them (touch and control them – senses 2a, 2c) Verbs like *fall, descend, creep, touch* and others may appear with this sense of *on*. Examples:

> *...produces an odor that provokes animals to attack. It could have the same effect on Communists. (D07:43)*
>
> *...magic square of three, a mere "mathematical puzzle", was able to exert a considerable influence on the minds and imaginations of the cultured Chinese for so many centuries,... (D08:12)*
>
> *...her imagination forced images on her too awful to contemplate without the prop of illusion. (K12:15)*

7.3.2   Topological Configuration senses

The topological relation of contact between trajector and landmark is perceptually prevalent over force-dynamic or functional aspects. Nevertheless, these remain in the background, and may produce distinctions that can be reflected in distinct senses of the lexical unit.

7.3.2.1 Shifts from the conceptual schema

a) *Contact* (sense 3). Partial sanction of the *conceptual schema* leads here to profiling of contact between trajector and landmark. The support relationship is no longer central, since the kinetic axis that acts downwards does not necessarily apply, nor the trajector's self-control. Contact occurs with the outer limits or boundaries of the landmark (see figure 7.9).
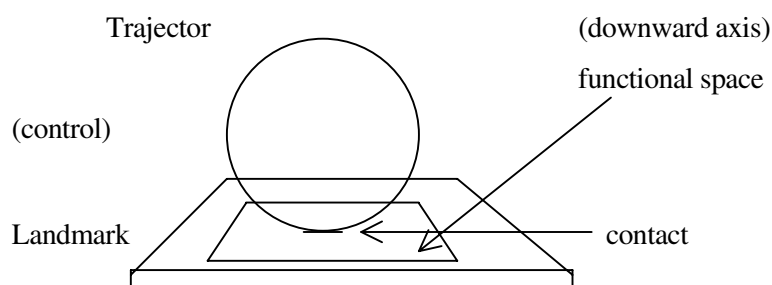
Figure 7.9: Contact

Examples:

> *...with his coffee, warming his hands on the cup, although the room was heavy with*
> *heat. (K12:68)*
> *Use water on finger to smooth seams and edges. (E15:94)*
> *...they were also stout controversialists, who could write with a drop of vitriol on*
> *their pens. (G07:42)*
> *He has designed a matching backdrop and costumes of points of color on white for*
> *Mr& Cunningham's <Summerspace>,... (G09:4)*

The idiomatic expression *on hand,* when it means 'in use, at one's disposal', reflects the sense of contact, as in this example:

> *...pressure was not determined because the pressure was beyond the upper limit of the*
> *apparatus on hand .(J03:20)*

b) *Attachment* (sense 3a). Contact is highlighted. The bottom of the trajector or its resting part is attached to the landmark (see figure 7.10). This sense appears in context with verbs like *engrave, stamp, paint, print*, or *write*. Landmarks refer typically to the human body or parts of it, as well as *paper, books, pages* or parts of them, but they can be other entities on which something can be attached, like *tapes, records, microfilms, a map, the ground*, or anything on which other entities are attached for a certain function. Trajectors express the things attached like *blots, stains, scars, wounds, flecks, spots, tattoos, traces, inscriptions, fingerprints, print letters, dust,* etc. Examples:

> *On the clock given him was the inscription, "For Outstanding Contribution to*
> *Billiken Basketball, 1960". (A15:66)*
> *Among some recent imports were seat covers for one series of dining room chairs on*
> *which were depicted salad plates overflowing with tomatoes and greens (B10:115)*
> *A gray fox with a patch on one eye – confidence man, city slicker, lebensraum*
> *specialist – tries to take over Catfish Bend... (C05:87)*
> *...who has been able to trace the letters to the national archives, where they are*
> *available on microfilm. (B12:31)*

The primitive-eclogue quality of his drawings, akin to that of graffiti scratched on a
cave wall, is equally well known. (C05:26)
Had it done so, the blot on its escutcheon would have remained indelible. (D05:11)
There is even one set that has "barbecue" written on it. (E14:31)
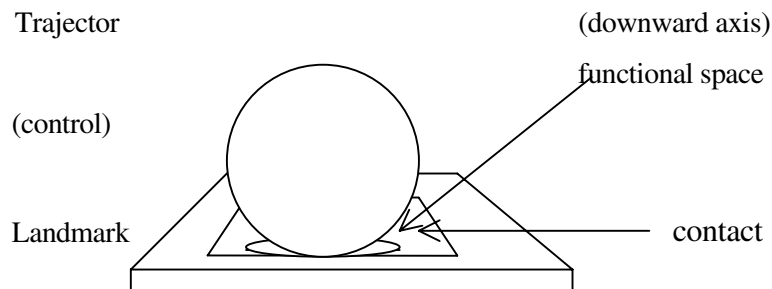
Figure 7.10: Attachment

c) *Part-whole relationship* Trajector is Part of landmark. (sense 3aα). A shift of meaning is produced from sense 3a (attachment) when the trajector, which is construed as if attached, is itself part of the external side of the landmark (see figure 7.11).
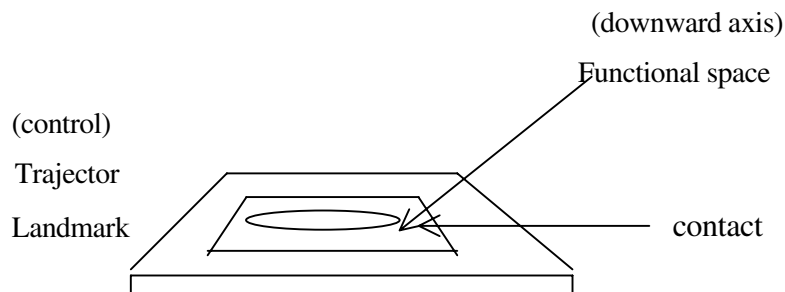
Figure 7.11: Trajector is part of landmark

This sense derives from the sense of attachment. Functional and force-dynamic aspects of perceptual space get bleached out. Perceptual contact is even stronger for the 3aα sense than for the *contact* sense (3) or the attachment sense (3a). The trajector is something understood or construed as a part of the external side of something (*nose on face, expression on face, ears on head, peaks on mountain*, etc.), or as a part attached to the whole, and forming part of it (*heels on shoes*). Examples:

...could still see the friendly grin on the young, sun-browned face... (B09:33)

Stacked heels are also popular on dressy or tailored shoes. (B13:9)

Most of the fingers on his left hand were burned off.... (C10:82)

He feels, suddenly, the weight of the fat that is on him. (B14:11)

...orbiting around like planets, you see waves and ripples very much like the ripples

that you get on the surface of a pond when you drop a stone into it. (D13:67)

d) *Definite contact* (sense 3b). Usage sanctions a shift from sense 3 (contact) on many occasions, where there is a landmark that designates an external definite zone or area of another entity (see figure 7.12). I suggest that contact is more precise on these occasions in terms of positional accuracy.
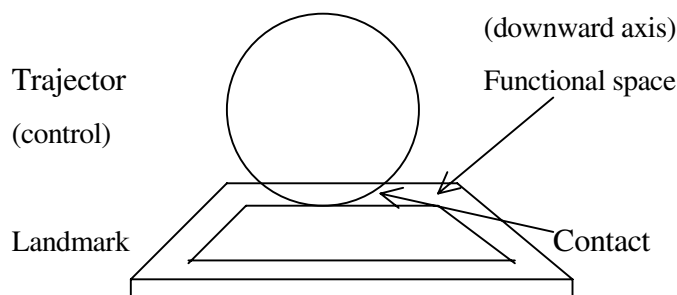
Figure 7.12: Definite contact

Expressions like *side, flank, right, left, part, hand* (metonymically meaning *flank*), *edge,* or the points of the compass occur frequently after *on*. These are in turn followed by a prepositional *of*-phrase which designates the whole entity. Sometimes, however, this entity is omitted, and usage sanctions collocations like *on ... side, on the right, on the left*, etc. Examples:

On the negative side of the balance sheet must be set some disappointment (A04:11)

At the top of the hill the buildings on the left gave way to a park. (E13:22)

He doesn't think that potting them from a deck chair on the south side of the house

with a quart glass of beer for sustenance is entirely sporting. (C01:93)

And the league takes a stand, with great regularity, on the side of right. (B01:23)

Idioms like: *on the one hand....on the other hand, on the contrary, on the part of, on behalf of*, and *on edge* may be considered as a result of this usage of the lexical unit *on.* Examples:

This was not a program intended to illustrate authentic folk styles. On the contrary, Miss Mao and Mr. Fuller chose many of their arrangements from the works of composers. (C07:92)

...the pastor should plan a variety of teaching techniques in order to develop greater interest on the part of the class. (D09:45)

State Controller Arthur Levitt, on the other hand, cannot effectively deny that he has chosen to be the candidate of those [sic] party... (B02:45)

...also was opposed by Leonard Kaplan, spokesman for the Home Builders Association of Philadelphia, on behalf of association members who operate apartment houses... (A09:43)

With quibs and gibes, the policemen again started digging. Welch was on edge. (R01:57)

e) *Contact with limits* (sense 3c). A further shift is produced when the landmark is construed as an area, and not as a volume. However, the reason is not the bi-dimensionality of the landmark, but the fact that its limits are clearly defined against the background. The meaning of *on* still is 'contact with the external side of the landmark'. It just happens that the external side of an area as such are its limits. This sense occurs with landmarks like *street, square, park, lake, road, river, sea, bay, way, track, coast, shore, beach, bank,* etc., that is, entities that can be construed as areas with outer limits. Therefore, the trajector, from the exterior of the area, is in contact with those limits, which may become the landmark itself (*border, verge, frontier, limits*, etc). Examples:

..., the new play at the brand-new Mayfair Theater on 46th St. which has been made over from a night club. (C13:41)

...explorers can roam as far west as Port Isabel on the Mexican border. (C15:86)

All this near tragedy, which to us borders on comedy, enables us to tell the story over and over again, (D05:15).

These striking, modernistic buildings on the East River are open to the public and every weekday guided tours are available. (E12:22)

Obviously the farm should be on an all-weather road. (F13:79)

The <John Harvey> arrived in Bari, a port on the Adriatic, on November 28th, making for Porto Nuovo,... (F02:3)
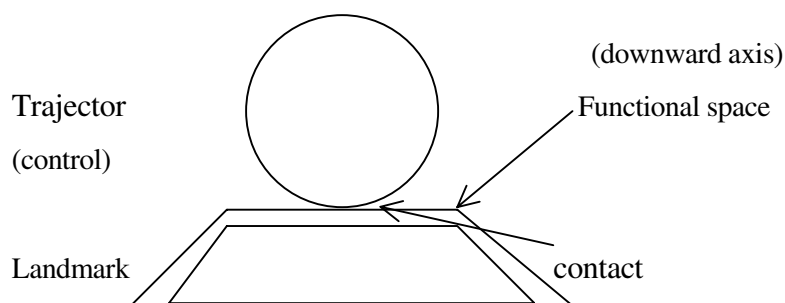
Figure 7.13: Contact with limits

7.3.2.2 Metaphorical extensions of the topological senses

1. PRESENCE is CONTACT. This metaphor seems to be mapped on to sense 3 (contact). The trajector is some event, state of affairs, or situation that is present to human sight or perception. Thus, *on* appears in collocations like *on exhibit, on display, on view*. Examples:

> *The current exhibition, which remains on view through Oct. 29, has tapped 14 major*
> *collections and many private sources. (C12:64)*
> *#AMERICANA# _PLEASURE DOMES._ Two sharply contrasting places designed*
> *for public enjoyment are now on display. (C15:32)*

2.- CONTENTS are the PHYSICAL CHARACTERS used to express them (<Meanings are the words used to expressed them). This seems to be a metaphor mapped on sense 3a, (attachment). The contents of *books, tapes, lists,* etc. are spoken of as if physically attached to them, as if they really were the physical printed ink letters, magnetic signals, etc. on them. Examples:

> *...the measure would merely provide means of enforcing the escheat law which has*
> *been on the books "since Texas was a republic". (A02:6)*
> *The Central Falls City Council expressed concern especially that more foods be*
> *placed on the eligible list. (A05:38)*
> *He is publicly on record as believing Mr. De Sapio should be replaced for the good*
> *of the party. (A07:11)*

Certain collocations of *on* before some nouns respond to this usage, like to be *on the list, to be on the schedule, to be on the plan*. Example:

> *The esplanade eliminates Grovers ave., which on original plans ran through the*
> *center of the development... (A09:6)*

3.- A GROUP is a WHOLE. Certain collective nouns like *team, staff, committee, board, commission,* etc., where a member of it is conceived of as a small part attached to the whole and forms a part of it. This metaphor is mapped onto sense 3aα (trajector is part of landmark). Examples:

> *...presentation was made to Mrs. Geraldine Thompson of Red Bank, who is stepping*
> *down after 35 years on the committee. (A06:86)*
> *Three positions on the Oak Lodge Water district board of directors have attracted*
> *11 candidates. (A10:47)*
> *I know when my reflexes are gone and I'm not going to be any 25th man on the ball*
> *club. (A13:40)*
> *...he was on the managerial staff of the freshman football team. (B12:36)*
> *On a team a man feels he is a part of it and akin to the men next to him. (B14:27)*

7.3.3   *Functional configuration senses*

Functional space – social space – may be profiled, and the relation of control exerted by the trajector is highlighted. Force-dynamic configuration and topological relationship remain in the background. These can provide an element for contrast with other lexical units that may appear in the same contexts as *on*, where the functional relationships between the participants are semantically more prevalent.

7.3.3.1 Shifts from the conceptual schema

a) *Control of landmark* (sense 4): The control attribute is profiled by virtue of partial sanction of the *conceptual schema*. Nevertheless, contact and the downwards kinetic axis remain in the background, since they are the factors that facilitate control. Trajectors are prototypically

human beings who exert control over other entities. It may also be the case that 'superior' entities, or circumstances, states of affairs, etc. are construed as exerting control over human beings. I suggest the following patterns as instantiating the control sense of *on*:

1.- Areas containing dwellings, like farms or states under the supervision of people. Examples:

> *"I'm called The Wrangler". "Nice to know you. Don't you have to spend any time*
> *on your ranch?" "Well, of course I do." (P06:127)*
> *The worker who lives on a farm cannot change jobs readily. (F13:6)*

2.- Buildings and places which are centres of activities (Stock Exchange) under the control of people as they carry on their activity there. Towns, streets, places of employment and work, when somebody exerts control over them. Jobs, as construed under the control of some person. Example:

> *...replace Desmond D. Connall who has been called to active military service but is*
> *expected back on the job by March 31. (A10:2)*

3.- Human control on artifacts, machines, instruments, or circumstances in general. Verbs and nouns that imply this relationship are *work on, decide/decision on, focus on, policy on, act/action on, influence on, check on, play on,* etc. Examples:

> *He missed the 1955 season because of an operation on the ailing knee,.... (A12:19)*
> *...today pushed aside other White House business to devote all his time and attention*
> *to working on the Berlin crisis address he will deliver tomorrow night to the*
> *American people. (A03:12)*
> *...he put Seaman 2/c Donald L& Norton and Seaman 1/c William A& Rochford on*
> *the guns and told them to start shooting the moment they saw an enemy silhouette.*
> *(F02:62)*
> *Action on a new ordinance permitting motorists who plead guilty to minor traffic*
> *offenses to pay fines. (A05:79)*

4.- Groups or Institutions that exert control on some chunk of social life. Example:

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Hackett, a special assistant of the Attorney General, as executive director of the new

Committee on Juvenile Delinquency and Youth Crime. (A04:71)

5.- In general, expressions that denote certain control of people over some other people, e.g. *be on sb., call on sb., shut the door on sb*, etc. A small set of idioms imply that human beings control their activity, like *on guard, on schedule, on alert, on duty, on the lookout,* etc. Examples:

The work week of attendants who are on duty 65 hours and more per week should be
reduced. (B01:52)
Now let us imagine a wing of B-52's, on alert near their "positive control (or fail-
safe) points", the spots on the map, many miles from (G03:103)

on call, meaning ready to come at a call, or controlling calls:

...orthodontists will recommend waiting four or five years before treatment. The child
is kept on call, and the orthodontist watches the growth. (F11:92)

on hand, meaning *imminent* or *about to occur* (*hand* is under control, since it has no time to react against what is about to come). Example:

The contents were highly embarrassing to American spokesmen, who were on hand
to promise Latin Americans a 20 billion dollar foreign aid millennium. (B03:79)
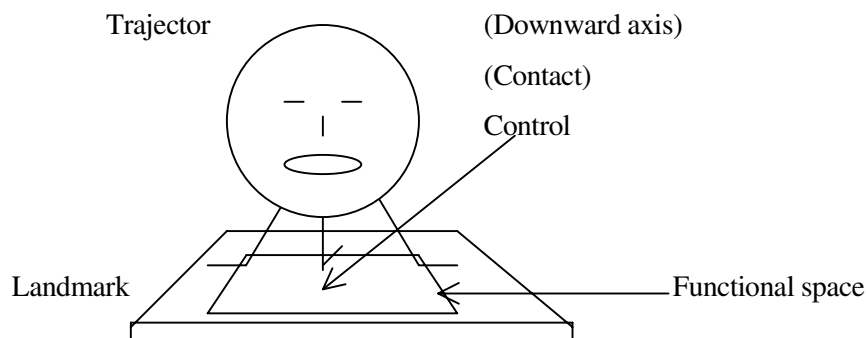
Figure 7.14: Control of the landmark

7.3.3.2 Metaphorical extensions of functional senses

1.- SEEING is CONTROL: With expressions like *look on, focus on, give on, face on, spy on, keep an eye on, etc.* where the sight of the trajector is conceived of as if controlling the visual field where the landmark is included. Examples:

> *The window looked out on the Place Redoute – it was the only window of the apartment that did. (K13:60)*
> *Keeping her frightened gaze on the men at the counter, she began to feel her way to the door. (L03:28.)*
> *Let us look in on one of these nerve centers – SAC at Omaha – and see what must still happen... (G03:70)*
> *Every eye was on him as he began to speak. (K10:21)*

2.- FEELINGS are CONTROLLERS. Certain psychic phenomena are spoken of as if they controlled people's attitudes and actions. Example:

> *A good feeling prevailed on the SMU coaching staff Monday,... (A12:36)*

3.- LAW is CONTROL. Law, norms, regulations, etc. are spoken of as if a device for control of other people's actions or activities. Example:

> *This prohibition on love has an especially poignant relation to art; it is particularly the artist. (G15:20)*

7.3.4   *The time metaphor*

By virtue of the time metaphor, time is understood as physical space (Clark, 1973; Lakoff and Johnson, 1980). The kind of space which people in our Western culture turn time into is a path kind. On a path we have two options, either we remain standing (or sitting, lying, etc.), or we move along that path. Both of these options offer two further possibilities. In the first case, we stand either facing other things coming to us, or with our back oriented towards them. In the second case, we move either facing our way, or with our back oriented toward

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the sense of our movement, let us say 'backwards'. European culture has chosen that the Future is ahead of us. Furthermore, we move forward to meet it. Thus, if we stand on the time path, the Future comes to us, and we see it coming on us. Moreover, we look ahead in order to meet it. Therefore, we think of it as moving forward. If we move, we do it in a sense that we think of as forwards, because we look ahead, in order to meet the Future[45]. In addition, the kind of path is a non-end path, so that one can go ahead without ever reaching the end.

The lexical unit *on* exploits both senses of the Western metaphor, the stative sense and the dynamic sense. Anna Wierzbicka (1993) has pointed out that *on* is used with periods of time, understood as extensions of space, and their duration. However, she does not discuss the relation of these – extension and duration – with the two metaphorical options, standing and moving on the time path.

In the temporal usage of *on*, the relation of the trajector with the period of time is one of contact, it holds on as long as that period lasts. The event, action, etc. referred to as *on a period of time*, may occur *at the beginning, at the end*, *at any time within that period,* or *at the period* as a whole. The difference with respect to the unit *at* resides in the fact that *at* exploits only the stative sense of the metaphor, so that it implies coincidence with the whole period. That is why *at* is more often than not used with very short periods or points in time, since complete coincidence is easier to conceptualise in those cases. *On*, however, allows for the choice of locating the event *at* any point of the period referred to. Since the dynamic sense of the metaphor is present, the events, activities, etc. that play the role of trajector may also be in contact with successive parts of the period referred to. Thus, *on Thursday* means *at any time as long as Thursday is on.* Let us compare the following sentences:

> *Mr. Notte was responding to a resolution adopted by the Central Falls City Council on July 10... (A05:28).*
> *At this late date, it is impossible for St. Michael's College to find a suitable replacement for me. (B26:51)*

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[45] This seems natural to us, but it is by no means the most natural option: If we know what we see, and we know our Past, but not our Future, our position on the time path could be with our backs oriented to the Future, and our faces towards the Past. So, the Past would fade away in the distance as time passes, with us proceeding 'backwards'.

In the first one, the resolution is adopted *on July 10*, but it does not matter when, as long as it is at the beginning, at the end, or at successive times of the period of time stated, along with its whole duration. In the second sentence, *at* is used because the date is coincident as a whole with the impossibility to find a replacement, and the duration of the *date* itself is not relevant as such. Some contexts will exclude *at*, others will exclude *on,* still other contexts will allow for the use of both. That, however, does not indicate synonymy, but alternative construal. (See figure 7.15 below).

According to this argument we find *on* used with: dates, names of week days, nouns referring to a day – like anniversary, Christmas, Easter – nouns denoting periods of time, parts of the day, etc. Examples from the BC illustrate this usage, as in:

> *...the levy is already scheduled to go up by 1 per cent on that date to pay for other social security costs. (A03:43)*
> *...back in some instances to colonial times, severely limit the types of merchandise that may be sold on the Sabbath. (A05:37)*
> *...and that neighborhood grocery and variety stores be allowed to do business on Sunday. (A05:38)*
> *...that a regrouping of forces might allow the average voter a better pull at the right lever for him on election day. (A05:46)*
> *...It was on the eve of a momentous U.N. session to come to grips with cold war issues. (B04:3)*
> *It is far better to have such conditions treated in advance than to have them show up on the honeymoon where they can create a really serious situation. (F07:39)*
> *On spring and summer evenings people leave their shops and houses and walk up through the lanes. (G05:53)*
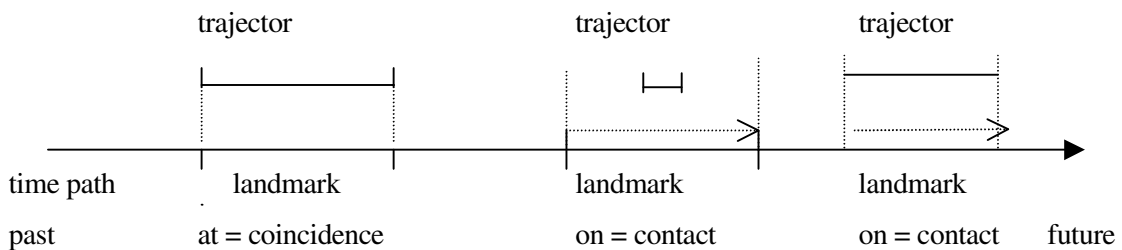
Figure 7.15. Time periods with *at* and *on*

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I suggest that certain collocations like *on + V-ing* may be understood with the help of the above account of *on*. The V-*ing* form refers to an action, activity, etc. with a certain duration. The trajector may be located on the time path at several points along the path as long as the activity lasts. Example:

> He recalls with a wry smile the wit who said, on returning from a homecoming
> reunion, that he would never go again because all his class had changed. (B14:18)

I will suggest an explanation for some idiomatic temporal uses of the unit *on*, on the basis of the above argument. The meaning of *on* allows for contact of the trajector (events, activities, actions, or a period of time) with the period of time (landmark), and particularly with the landmark's outer limits, as shown in figure 7.16, below. These expressions are the following:

on time: When the span of time referred to is an arranged time with hardly any extension. The use of *on* indicates that the trajector may be just in contact with the boundary of the time arranged, i.e. immediately after or immediately before. Thus, this expression has been conventionalised for those situations where people are punctual.

later on: This expression conveys the idea of a posterior time, just in contact with the period of time regarded as the present time or the period of time which is taken as a reference. *Later* expresses a time to come, whereas *later on* expresses the time to come just after the time being. The time of reference is expressed by phrases like *now, in the meantime, for the present*, etc. Example:

> Money for its construction will be sought later on but in the meantime the State
> Hospital board can accept gifts and donations of a site. (A02:36)

from + [period of time] + on. The time referred to by *on* is the time in contact with the period expressed, i.e. the time which begins immediately after that period. Example:

> ...healing, and well doctored with simples, before they dished up the victuals. From then
> on, in keeping with the traditions they had followed since childhood, the whole group
> settled down... (N13:54)

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time path lm   lm   lm   lm

on time   later on   later   from [period] on
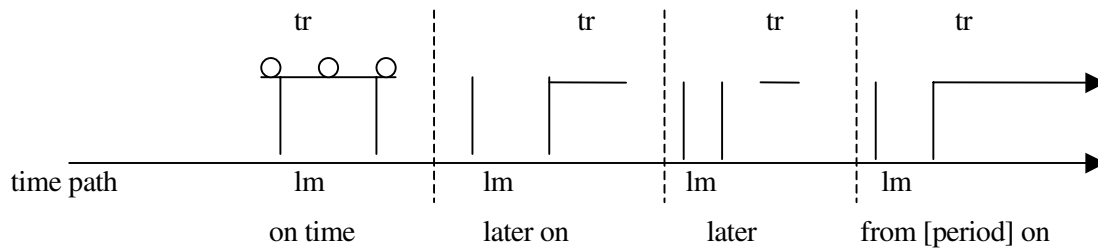
Figure 7.16: Some expressions with *on*

7.4 *On the adverbial use of on*

The adverbial use of *on* does not bring on a different semantics of this lexical unit. Prepositional uses make the landmark of the *on* relation explicit in a PP construction. Adverbial uses leave the landmark linguistically unspecified, or specified by means of linguistic elements other than a prepositional complement. It may occur that the landmark is the subject of the clause, and the trajector is the object. Or it may occur that the landmark is unspecified and the trajector is the subject, or the object. This can be appreciated in the following examples:

> *We always thought <u>we</u> would die with <u>our boots</u> on. (F06:7)*
>   lm   tr
> *But with <u>the months</u> moving on – and the immediate confrontations with*
>   tr
> *the Communists showing no gain for the free world. (A04:33).*
>
> *Graft in the construction of highways and other public works has brought on   <u>state</u>*
> *<u>and Federal investigations</u>... (A07:31)*
>   tr

Another issue is the diverse consideration of adverb and adverbial particle of phrasal verbs. With regard to this question it is assumed here that the phrasal verb construction is not different in character to a verb plus adverb construction. On the contrary, they are ends of a continuum that instantiates a scale of conventionalisation and grammaticisation degrees.

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Taking that into account adverbial usage of *on* may be identified semantically with prepositional use. However, not all prepositional meanings find a parallel adverbial use. The following have been found:

1.- Support (senses 1, 1b):

> *We always thought we would die with our boots on. (F06:7)*
>
> *After well broken and equipped with 12oz shoes on behind, bare-footed in front, she would trot a real storm with the master, Delvin, driving. (E09:72)*
>
> *The man wore a vest and a tie, the woman had on a dark green dress and three strands of pearls. (K12:115)*
>
> *And I done favors for you, big favor not so long back, didn't I, and I'm right here to take on where Pretty left off. No trouble. (L08:9)*

2. Movement ending in support (sense 2):

> *And to see the meaning of this new picture, imagine that you can put on more powerful glasses and go back inside the atom. (D13:66)*
>
> *...large numbers of Southerners would have happily put on their old Confederate uniforms to fight as allies of Britain. (G01:75)*

3. Movement ending in contact (sense 2b):

> *But the farmers outsmarted Washington by shortening the distance between the rows and pouring on the fertilizer. (B05:33)*
>
> *... the peonies, whose tight sticky buds would be blighted by the laying on of a finger, although they were not apparently harmed by the ants that crawled over them;... (G14:30)*

4.- Trajector becomes part of the landmark through contact (sense 2d):

> *Jacques again, as his little operetta, <The Village Soothsayer,> though still unperformed, took on ever more importance. (K08:97)*

...it will not be long before your entire upper leg takes on a razor-sharp definition in which the muscles look like wire cables writhing and twisting... (E01:62)

5. Attachment (sense 3a):

Do you love to run up a hem, sew on buttons, make neat buttonholes? (F06:83)
Putting   on   local musicians at this place in the program serves a triple purpose. (C08:45)

6.-Trajector is part of landmark (sense 3aα):

...the hammock at night, and it gets kinda cool – you know – you just take these sides with the fringe on – see – and wrap 'em right over you. (B09:45)

7.- There is an adverbial use related to the metaphor PRESENCE is CONTACT. The trajector is conceived of as in contact with the time path, and the span of time is the present. The meaning of *on* in this usage turns out to be roughly 'present', 'alive', 'in actual duration'.

Would not the emotional catharsis eventually brought on by this awfulness have a calming, if not exhausting, effect likely to improve his client's chances? (F14:9)
...in any sympathy for the problems of human beings caught up in the distress and suffering brought on by the economic crash. (B14:55)
Only recently new 'holes' were discovered in our safety measures, and a search is now on for more. (G03:23)

8.- The contact sense has developed a new metaphor: ON FUNCTION is IN CONTACT. If we apply energy to a machine it starts functioning. In origin, the ON and OFF commands on machines indicate contact with or separation from energy supply. Now, ON means 'while working or functioning'. This is easy to explain, because human perception is not aware of the actual contact of the machine with the energy supply. On the contrary, human naive perception of the situation links the ON command with the fact that the machine is working.

I'd just turned on the ignition when there was a big flash... (A09:74)

Miss Colman pours measures of whole wheat, oats, and soy beans and turns on the motor. (F04:51)

...crisis was artificially stirred up by the Kremlin (Wall Street) and the Red Army (Pentagon) egged on by the West Germans (East Germans). (B11:66)

Again, there is a possible ambiguity with the temporal-spatial sense of *on* as 'forwards', when a machine or another entity is 'functioning by moving forwards', or 'moving forwards by functioning'. Example:

He unhitched his horse, walked it away, mounted, and spurred it on. (K05:86)

9.-Finally, the TIME metaphor provides an adverbial sense, which has been commented on with regard to expressions like *later on*, and *from [period] on*. This sense refers to the time immediately after the time of reference, i.e. in contact with the outer limit of the period of time that constitutes the landmark. It occurs in other expressions like *further on,* and *so on.* When the landmark is not specified, *on* refers by default to the time immediately in contact with the outer limits of the last period of time referred to in the discourse.

This sense occurs very often associated with verbs of movement and activity. In this context, and in accordance with the time metaphor, speakers express continuity by referring to the activity and to the time immediately after the last temporal reference of such activity: Thus, combinations like *move on, go on, push on, carry on, eat on, read on, linger on, hold on,* etc are frequent with different degrees of conventionalisation. Examples:

There was no debate as the Senate passed the bill on to the House. (A02:19)

...an opportunity to end the bitter internal fight within the Democratic party that has been going on for the last three years. (A07:3)

He could tell the Legislature they had provided the needed funds to carry on the battle. (A08:73)

He was wounded, but fought on. (F02:117)

It was getting on toward 7 o'clock and the German Me-210 plane had been and gone on its eighth straight visit. (F02:30)

With verbs of movement there is a double possibility of reference to time or space. The time metaphor is nothing else but a representation of time as a path on which events move forward towards the future. This representation may turn literal with verbs of movement like *move, go, come, march*, etc. so that *on* adopts a spatial sense derived from the temporal sense. The mapping goes back to space from the sense 'immediately after the time of reference, i.e. in contact with its outer limit', and turns out to mean 'immediately ahead of the space of reference, i.e. in contact with its spatial limits in the direction of movement'. In other words, with verbs of movement *on* may adopt a spatial sense similar to 'forwards' or 'ahead'. Accordingly, *go on* is ambiguous. Its meaning can be temporal, (continue) or spatial (go forwards). The same occurs with other verbs of movement. Examples:

> *But with the months moving   on – and the immediate confrontations with the Communists showing no gain for the free world. (A04:33).*
> *Otherwise, UN will march blindly on to certain defeat. (B03:57).*
> *...putting white houses of prostitution with colored girls in colored neighborhoods and carrying them on openly. (K04:117)*

7.5   *A radial category for on*

The various senses of the unit *on* have been illustrated with examples in the previous sections. The *primigenial sense* (sense 1) combines the three modes of spatial perception: topology, force-dynamics, and function. Therefore, it is posited as the sense which is acquired first in first language acquisition. Once in existence, the *conceptual schema* may undergo some shifts, due to its application to new situations and contexts, as in fact happens with the *conceptual schema* of *on*. Senses 1a, 1b, and 1c arise as shifts of the conceptual schema: rotation of the schema, transformation of landmark into an axis, and transformation of the landmark into a part of the trajector, the one in contact with the actual supporting entity. Senses 1, 1a, 1b, and 1c combine the three modes of perception and may be called the SUPPORT senses. The relationship of support is profusely used for metaphorical mapping onto domains of human experience other than the physical domain.

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Partial sanction of the conceptual schema produces three further groups of senses, namely, force-dynamic, topological, and functional senses. At the first level of specialisation – i.e. senses directly linked to the conceptual schema (2, 3, 4) -, the specialisation of *on* takes place by simple highlighting of one of the perceptual aspects, i.e. partial sanction of *the conceptual schema*. Figure 7.17 shows the different conceptual regions separated by dotted lines. Certain senses are produced through double highlighting of two of the perceptual attributes. Thus, sense 2a (Motion ending in control of landmark) activates as more salient both force-dynamic as well as functional aspects. On the other hand, senses 2b (Motion into contact) and 2d (Trajector becomes part of landmark through contact) share topological and force-dynamic aspects, while control remains in the background. Conceptual distance is graphically represented by actual distance between the rectangles. So, the extreme senses (2c, 2d, 3c, and 3aα) which are farthest from the conceptual schema, are also the least similar to it semantically, sharing the fewest number of family resemblances with each other. For them the idea of support fades away and becomes almost absent. Interestingly, senses 3a and 3aα are next to the force-dynamic region, whereas 3b and 3c are next to the control region. These positions are relevant for the semantic consideration of these senses. It must be borne in mind that categories for senses are fuzzy, and many examples are of difficult classification. Rather than representing them by squares linked by lines we should see them as clouds that lose and gain density as long as we move away from or approach a particular label on the figure.

Topological
Configuration

Force-dynamic
configuration

2d Tr becomes part
of lm through contact

3aα Tr is part of lm

2c Motion →attempted contact
→attempted control

3a Attachment

2b Motion →Contact

3 Contact

2 Motion → support

3b Definite contact

1a Rotated
1
SUPPORT

3c Contact
with limits

1c Part of tr is lm   1b Axial lm

2a Motion → Control of lm

4 Control of lm
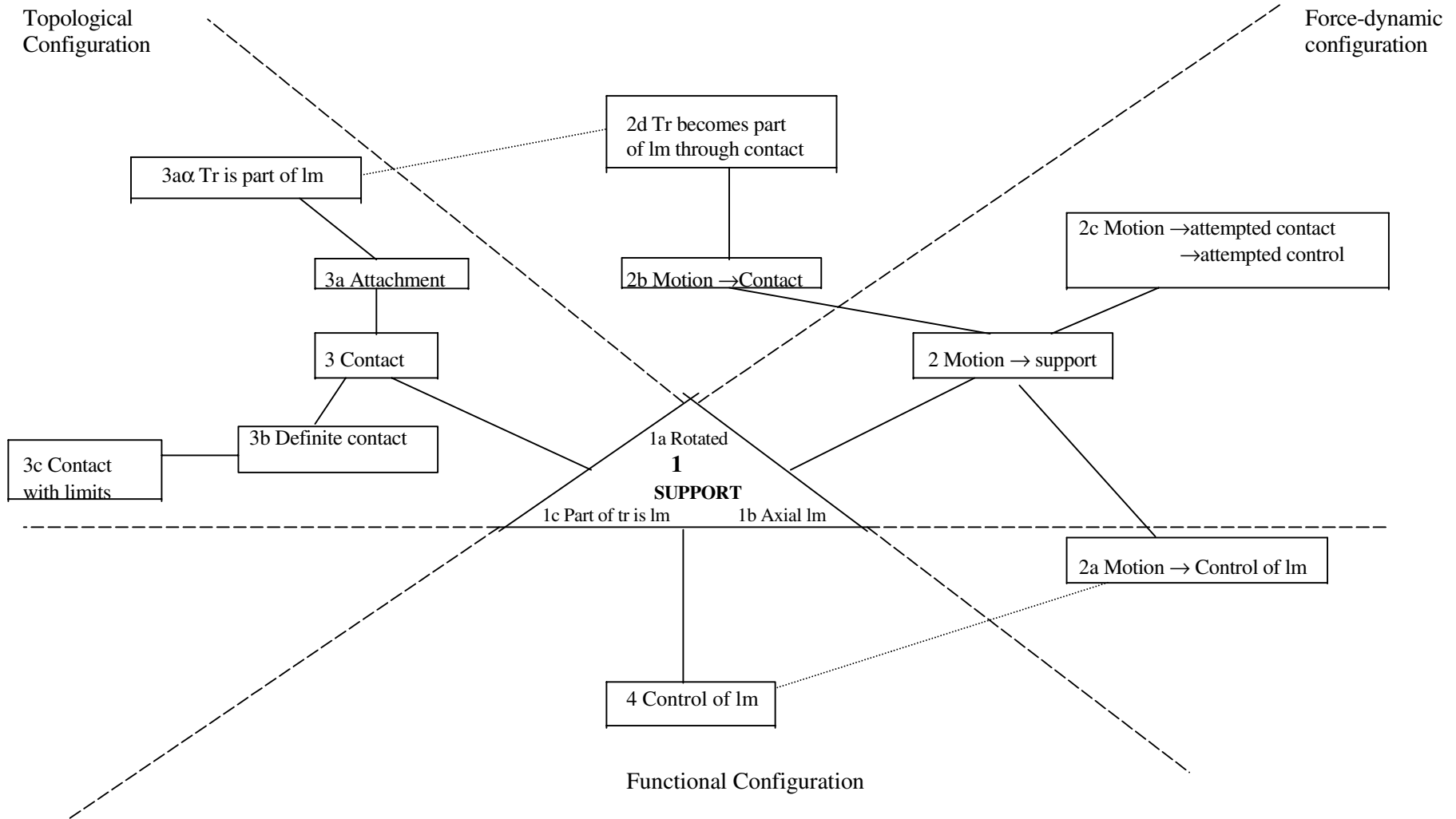
Functional Configuration

Figure 7.17: Radial category for *on*

7.6   Conclusions

Of a total of 2.511 instances analysed, only 210 were adverbial uses (less than 10%). This refers to all the instances where the landmark is not a complement of a PP. In addition, the unit *on* as a prefix or suffix occurs in a reduced number of nouns like *onset* (41 tokens)*, onrush* (1 token), *onslaught* (2 tokens)*, onlooker* (1 token), adjectives like *oncoming* (2 tokens), or adverbs like *whereon* (1 token)*, head-on* (2 tokens)*,* which were not taken into account for the semantic analysis. Such a syntactic distribution shows that the lexical unit *on* appears prototypically as part of prepositional constructions, but not exclusively. It may also appear as adverb, nominal prefix, adjectival prefix, or adverbial prefix in this order of preference.

The *conceptual schema* shows the largest set of family resemblances, and constitutes the primigenial sense based on bodily experience; it is the first sense acquired by children. The radial network resultant from this analysis of *on* is more complex than that of *at.* We might expect a prototype different from the conceptual image schema to appear, as is the case for *at.* Nevertheless the most frequent sense in the corpus is, in fact, the sense of the *conceptual schema*. In addition, the *conceptual schema* is the source for the most frequent metaphorical usages of *on* in adult language.

The central claim of this chapter is the refutation of a widely held assumption, namely that *on* merely means 'location on a surface' or just 'contact'. It has been shown that three aspects of the perception of space by human beings are necessary to explain the prototypical relation of SUPPORT. The geometric configuration of the landmark, in fact, turns out to be irrelevant. Meaning extension from the initial *conceptual schema* takes place by virtue of conceptual shifts (senses 1a, 1b, 1c), partial sanction of the *conceptual schema* (senses 2, 3, 4), double highlighting of more than one of the three perceptual aspects (senses 2a, 2b, 2d), or semantic bleaching, which leads to more abstract senses as long as the attributes conferred to the concept through bodily experience fade away (senses 3c, 2c).

The set of unclassified tokens corresponds to the expressions *on – occasion* (14 tokens), *on the whole* (4 tokens) *on the move* (1 token) and *to lose sth. on sb* (1 token).

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Table 7.1 shows frequency and percentage of the *on* senses. Tables 7.2, 7.3, 7.4, and 7.5 show frequencies and percentages of metaphorical extensions per groups of senses (temporal uses are not included).

Table 7.1: Absolute frequencies and percentages of *on*-senses.

SENSE	ABSOLUTE FREQUENCY	PERCENTAGE
1a schema	1052	41.90
1b rotated schema	51	2,03
1c axial support	6	0,24
1d lm is part of tr	36	1,43
2a motion ending in support	99	3,94
2b motion ending in contact	116	4,62
2c motion ending in control	50	1,99
2d motion attempting contact+control	35	1,39
2e tr becomes part of lm	9	0,36
3a contact	52	2,07
3b attachment	132	5,26
3b tr is part of lm	59	2,35
3c definite contact	176	7,01
3d contact with limits	42	1,67
4 control of lm	244	9,72
time metaphor	332	13,22
unclassified	20	0,8
TOTAL	2511	100%

Table 7.2: Absolute frequency of senses metaphorically and metonymically extended from the conceptual schema and percentage in the support group:

Metaphor / metonymy	absolute frequency	percentage
Responsibilities are burdens	11	1,05
Argumentation is a building	9	0,86
Causes are support	57	5,42
Help is support	48	4,56
Resources are support	50	4,75
Psychic phenomena are burdens	4	0,38
Topics are pieces of ground	215	20,44
Conduit metaphor	7	0,67
Media metaphor	22	2,09
Air is a supporting medium	8	0,76
Processes are paths	10	0,95
Reasons are support	40	3,8
Expenditures are burdens	19	1,81
Scale metaphor	20	1,9
State of affairs is support	13	1,24
Law is support	9	0,86
Knowledge is a building	8	0,76
Theories are buildings	17	1,62
Believes are support	6	0,57
Institutions are support	1	0,1
Disease is a burden	1	0,1
Penalties are burdens	1	0,1
Main component is support	1	0,1
Physical phenomena are support	5	0,48
Laws of nature are support	1	0,1
A channel is a path	6	0,57
Event on path is path	29	2,76
Total metaphorical uses	618	58,75
Total	1052	100

Table 7.3: Absolute frequency of senses metaphorically extended from senses 2, 2a, 2b, 2c and 2d and percentage relative to these senses:

Metaphor / metonymy	absolute frequency	percentage
Light is a fluid	6	1,94
Actions are directed movements	7	2,27
Spending is pouring	7	2,27
Seeing is touching	6	1,94
Psychic phenomena are aggressors	2	0,65
Total metaphorical uses	28	9,06
Total motion uses	309	100

Table 7.4: Absolute frequency and percentage of senses metaphorically extended from senses in group 3:

Metaphor / metonymy	absolute frequency	percentage
Presence is contact	82	15,68
Contents are physical objects	45	8,6
A group is a whole	11	2,1
Total metaphorical contact uses	138	26,39
Total contact uses	523	100

Table 7.5: Absolute frequency of senses metaphorically extended from sense 4 and percentage relative to that sense:

Metaphor / metonymy	absolute frequency	percentage
Seeing is control	16	6,72
Feelings are controllers	2	0,84
Law is control	2	0,84
Total metaphorical uses	20	8,4
Total control uses	238	100

8. THE SEMANTIC STRUCTURE OF IN

8.1 Morpho-syntactic usage

All the constructions where *in* appeared were taken into account for the analysis. The analysis shows that this lexical unit appears in prepositional constructions as described by the grammar (cf. 2.2.1), but it also appears as a nominal suffix and prefix, as an adjectival suffix and prefix, as an adverbial suffix and prefix, as an adjectival stem, as an adverbial particle of phrasal verbs, and as an adverb. Thus, the following morpho-syntactic environments for *in* have been observed:

a) Prepositional constructions: Head of a postmodifier PP in the constructions *NP P NP* and *A P N,* preposition with prepositional verbs, in the construction *V P NP*, head of an adjunct PP in a VP in the construction *V P NP,* head of a disjunct and conjunct PP. Examples:

> "This is one of the major items in the Fulton County general assistance program" (A01:14)
> "Haydn's Sonata in E minor, which was unfailingly pleasant in sound," (C03:26)
> "Cooperative Farm Credit can assist in Rural Development." (H01:70)
> "...we feel that in the future Fulton County should receive some portion of these available funds,..." (A01:16)
> "In other words, like automation machines designed to work in tandem, they shared the same programming" (F01:7)
> "...providing an air gap of 1/16 inch between the plate and the surface of the anode holder.   In addition, the inner surface of the carbon shield was covered with aluminum foil to reduce radiation..." (J02:60)

b) Nominal suffix and prefix (*drive-in, inboard, inlet, inmate, sit-in, inset, insight*). Examples:

> "I had noticed a drive-in down the road a quarter of a mile." (L02:110)

"The sight of sleek inboards, outboards and sailboats being wheeled smartly along highways many miles from any water is commonplace." (E06:15)

"It's a house of prostitution for white men with white girls as inmates." (K04:110)

"But there have been abrupt changes as well: the sit-ins, the picket lines, the bus strikes – all of these were unheard-of even ten years ago." (G08:31)

"(For details see inset, fig. 5.)" (H15:5)

"Two late Sonatas, Op. 110 and 111, were played with similar insight, ..." (C12:72)

c) Adjectival prefix (*in-person, in-state, inboard, inborn, indoor, inland, inward*). Examples:

"Some of the in-person performers were Jack Teagarden, Gene Krupa, ..." (C02:15)

"1184 copies of the R.I. Directory of Manufacturers were distributed: 643 in-state and 541 out-of-state." (H06:49)

"You may order utility models, inboard or outboard, with or without toilets," (E06:33)

"We believe that autism, [...], is to a large extent inborn." (B10:62)

"...,table-tennis and other indoor sports..." (C01:77)

"Inland, outboard motorists welcome cooler weather and the chance to buzz over Colorado River sandbars and Lake Mead." (C15:79)

"This is well evidenced by the Quietist doctrines carried over in Zen: the idea of the inward turning of thought, ..." (D15:51)

d) Adjective or adjectival stem (*inner, innermost*). Examples:

"His own inner voice, which should tell him what not to do,." (B13:110)

"...the inner surface of the carbon shield was covered with aluminum foil..." (J02:60)

e) Adverbial suffix and prefix (*herein, hereinafter, indoors, inward, inwardly*, *inshore*) Examples:

"It is these other differences between North and South [...] which I chiefly discuss herein." (G01:7)

"Subject to the limitations hereinafter provided, ..." (H12:20)

"... not a dead or wilted flower is ever seen indoors or out by any visitor." (C15:40)

"These engines can be removed from a boat with relative ease, wherein lies their greatest advantage." (E06:42)

"...the magnetic forces set up by the passage of current cause the edges of the foil to roll inward toward its center line,...." (H11:16)

"Japanese salvage firms were not permitted to operate on the hulks of warships sunk too close inshore." (P05:18)

f) Adverbial particle in phrasal verb constructions. Example:

"That would be worse tha [sic] useless", Alexander broke in." (P07:50)

"...a sailor returns, unrecognized, and gets done in by his wife." (C07:109)

Sometimes the high degree of grammaticisation is shown by the attachment of the particle to the stem, as a suffix in the formation of adjectives (*blacked-in, boxed-in, built-in, fade-in, fill-in*), or nouns (*drive-in*). Examples:

The blacked-in blades indicate a fixed aspect – the blade does not move... (E7:30)

The toilet hadn't had a sincere scrubbing in years and there were things written on the walls of the little boxed-in place... (P09:65)

The builtin [sic] headache of the Barnett regime thus far has been the steady stream of job seekers... (A08:39)

In his CDC work, Carvey has the close-in support and advice of one of California's shrewdest political strategists. (B11:29)

Just after sunset is a good time to record the city lights in color since you get a fill-in light from the sky. (E12:81)

g) Nominal stem (*inning*) or noun. Examples:

The Bears took the lead in the first inning , as they did in Sunday's opener, and never lagged.(A13:7)

8.2.   *Conceptual schema for in*

8.2.1   *General conceptual schema*

The container schema is one of the preconceptual schemas posited by Johnson (1987). In fact, the container schema is so pervasive that it prompts the creation of a concept of its own. In saying this it is not meant that the lexical unit *in* always fully instantiates that schema. What is proposed here is that the image-schema introduces the primigenial *conceptual schema*, or impetus for the concept. However, that primary *conceptual schema* does not remain unchanged through usage, and polysemy occurs. Therefore, though the origin of the concept *in* may be looked for in the container schema, a relation of identity between both notions should not be presupposed.

The basic logic of the container schema (Lakoff & Johnson, 1980; Johnson, 1987; Lakoff, 1987; Fornés & Ruiz de Mendoza, forthcoming) can be fairly reinterpreted in terms of a summation of topological, force-dynamic, and functional configurations. It is assumed that children's experience with containers first gives the clues for the assemblage of configurations. This could lead to the idea that the logic of containers is not as preconceptual as those who first proposed it claimed, i.e. the idea of container is not preconceptual, but a full concept on its own. What is preconceptual are the topological, functional, and force-dynamic image-schemas that conflate in the container image-schema. Recent research on the nature of the container schema points out its complex character from a different perspective by noticing that other image-schemas might be subsidiary to it (Fornés & Ruiz de Mendoza, forthcoming; Peña, 1997). These considerations might give rise to controversy on whether the container schema is the result of a conceptual assemblage, or rather the source of further conceptual enrichment. However, it seems to be the case that the two approaches are not in opposition. On the contrary, being the result of an assemblage of topological, force-dynamic, and functional configurations does not preclude further conceptual enrichment.

Now, the primigenial conceptual schema for *in*, as derived from bodily experience would involve the following elements:

1.- The trajector is a finite entity. Being finite is what makes it possible for it to be contained in a different entity. Human beings, animals and objects are bounded entities whose finiteness is given by their boundaries. Gases, fluids and massive entities are finite as long as a certain amount of them is taken into consideration. Very few entities are nonfinite, for instance, the universe, the ocean, the heavens, the vacuum, the infinite itself, and very few more, if any. Therefore, almost anything can be conceptualised as trajector of *in*.

2.- The landmark is an object or entity which defines the boundaries of a region, and so determines some limits and capacity for that region. Therefore, the landmark defines an interior space where the trajector is located. At the same time the boundary is not a complete closure of the interior region, so that an access / exit exists through which entities may enter or exit that interior region.

3.- According to the force-dynamic configuration, the trajector may be static within the interior region defined by the landmark. If it moves, its movement defines a trajectory either within the interior or from the exterior of the landmark to find its end in it. Thus, movement of the trajector may affect the interior of the landmark. In any case, the force-dynamic configuration of *in* precludes movement towards the exterior of the region defined by the landmark. For that reason, the access to the interior region is not on the bottom of the container, which would cause the trajector to fall out of the landmark by the effect of gravity. Only with trajectors that are not under the effect of gravity (gas) could the exit be in the bottom part of the landmark (e.g. *smoke in the upside down glass*).

4.- According to the topological configuration, the trajector must be smaller than the landmark. Perceptually, both coincide in space, so that the space occupied by the trajector is also occupied by the landmark, but not vice-versa. This is so, as long as, prototypically, the interior region defined by the landmark cannot be perceived from the outside, and is therefore conceptualised as part of the landmark itself.

5.- Functional configuration defines the roles of trajector and landmark with respect to each other. Since the landmark is seen as an entity that both prevents the trajector from moving

freely and impedes access of other entities to it, the roles are defined by a control relationship. This control may adopt two forms: reclusion or protection, depending on which aspect is emphasised. The landmark controls the trajector according to either pattern. In any case, the *in*-relation never allows for control of the trajector over the landmark (see figure 8.1).

6.- The landmark's active zone is the invisible one, which defines the region called interior. The trajector lacks a definite active zone, because all of it is involved in the relationship.

7.- Since the predicate *IN* may refer to the *universe, the world,* etc. as a general medium or container where all life takes place, the scope of predication may be maximal. The scale of trajector and landmark need not be the same. The trajector may be a predicate at a smaller scale than the landmark. Thus, it is possible to speak of *molecules in the world*.

As a tentative label for this *conceptual schema* the term ENCLOSURE is proposed. This meaning (sense 1) is instantiated in a wide range of possibilities. The following are the most salient:

a) Manmade containers such as glasses, vases, plates, bowls, cups, jugs, drawers, pans, pots, deposits, basins, tins, etc. Examples:

> *He came through from the Fleet Bar, which was stag, with the ice cubes tinkling in a glass he carried. (P05:28)*
> *They tasted good to him, so he brought some to breakfast to eat in his cereal bowl with milk and honey. (F04:98)*

b) Natural containers like caves, wells, shells, etc. Examples:

> *There was a sniper's nest in a mountain cave,... (K03:39)*

c) Vehicles for transport like different types of cars, buses, trains, different types of ships and boats, aeroplanes, etc. Examples:

> *For 25c load up the cooler with ice and keep cool pop in the car. (E14:61)*

J. Pierpont Morgan had come in his private train to San Francisco, ... (E11:49)

... Helva was unconditionally graduated and installed in her ship,... (M05:93)

d) Human and animal bodies, as well as their parts, as containers. Examples:

... if I could snap my fingers in one magic gesture to release the power of all the hydrogen in my body, I would explode with the force of a hundred bombs of the kind that fell on Hiroshima. (D13:17)

Suppose I had the same number of peas as there are atoms in my body,... (D13:31)

Why, I once used this machine to cure a woman with 97 pounds of cancer in   her body. (F10:18)

e) Buildings, dwellings, houses, parts of buildings like different kinds of rooms, dependencies, etc. Examples:

Only too often, however, you have the feeling that you are sitting in a room with some of the instruments lined up on one wall to your left... (C02:68)

She lived in an ultra-modern house... (R02:65)

f) Envelopes, sheaths. Examples:

...depends on the current, the temperature in the arc column, the anode material, and the conditions in the anode sheath. (J02:15)
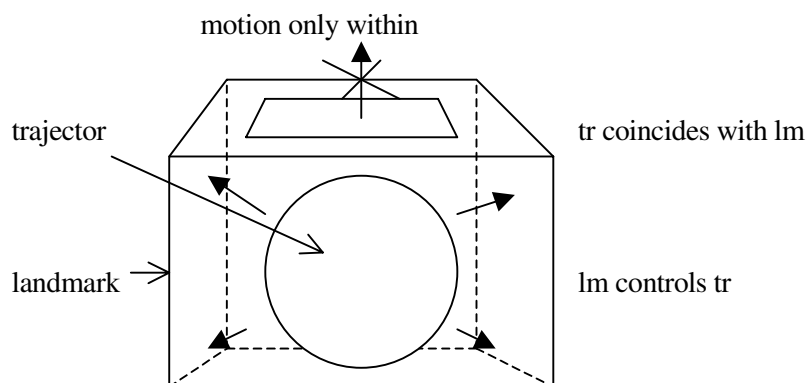
Figure 8.1: Conceptual schema of *in*: Enclosure

8.2.2   Shifts of the conceptual schema

a) *Partial enclosure* (sense 1a). The boundaries defined by the landmark are incomplete. Therefore, control is incomplete. The sense of protection is emphasised over the sense of seclusion. Topological coincidence might not be complete, and movement of the trajector towards the exterior is not completely barred (see figure 8.2). *In* occurs with landmarks like *corner, frame, rack, shelter, door, ceiling, seat, lap, balcony*, diverse types of *clothes, beds, chairs, shoes, trees*, etc. Examples:

> *The blonde's nude body was in bed, a green sheet and a pink blanket covered her. (F09:111)*
>
> *Alley fences were made of solid boards higher than one's head, but not so high as the golden glow in a corner or the hollyhocks that grew in a line against them. (G14:3)*

motion only within

trajector

tr coincides with lm

landmark

lm controls tr
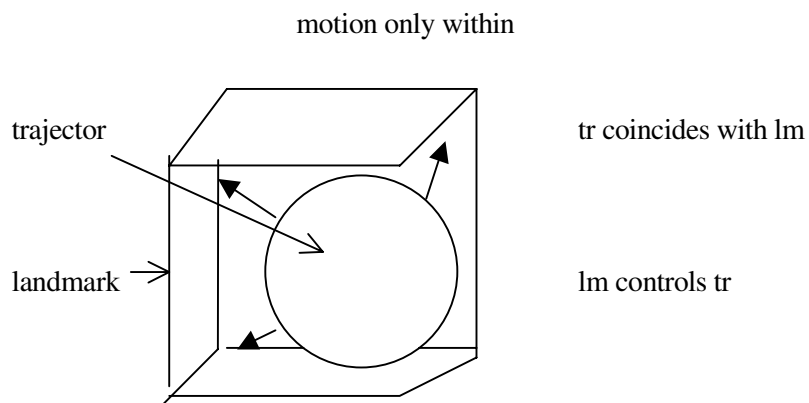
Figure 8.2. Partial enclosure

b) *Interior region is landmark* (sense 1b).The region limited by the landmark takes the role of the landmark itself. It is referred to as a space with presupposed boundaries which define it as an interior region, though these boundaries are not salient. This sense occurs with landmarks that denote the space within a container, such as *interior, space, hole, inside, slot, crack, hollow, leak, doorway*, etc., as well as in the expressions *in lieu of,* and *in place of.* Examples:

> *...abetted in this case by appropriately stilted English language that has been excellently dubbed in place of the Russian dialogue. (C01:102)*

The sheriff was occupied with maneuvering the car around in a very narrow space (L04:165)

Number all the tappet bars before removing them so they can be replaced in the same slots. (E07:75)

8.2.3   Extensions of the conceptual schema

8.2.3.1 Metaphors:

1.- The MIND is a CONTAINER for thought, memories, knowledge, etc. The HEART may be a substitute of MIND when the trajector has an emotional value. Examples:

Rhode Island is going to examine its Sunday sales law with possible revisions in mind. (A05:24)

One did one's best and if fortune frowned, an eighteen-year-old boy with murder in his heart sailed aboard one's ship. (P07:84)

2.- BOOKS are CONTAINERS. Here *books* is used as a generic term for writings, documents, literary works, newspapers, periodicals, journals, magazines, notes, the press, letters, compilations, papers, etc., or parts and sections of these. The trajector is the contents of the book. Example:

But the one that upset the financially wise was the professional dancer who related in a book how he parlayed his earnings into a $2,000,000 profit on the stock market. (B13:91)

The classical metonymy used to refer to a book by means of the name of its author is included in this group. Example:

It is probably fair to say that the idea of death is more profound in Irenaeus than the idea of sin is. (D04:57)

3.- INSTITUTIONS are CONTAINERS for people and events. Organisations like political parties, police corps, societies and associations, councils, Congress, the clergy, the Church, Parliament, government, universities, schools, marriage, etc. illustrate this sense. Example:

> *...courteous, explanation has left basic positions unchanged, but there has been no explosion in the council. (A04:7)*
> *Some of my fellow workers were grooming me for an office in the Socialist Party. (A05:50)*

4.- CIRCUMSTANTIAL STATES contain PEOPLE. A series of difficult or bad circumstances is considered as a container that reduces somebody's mobility and exerts some control over her. On the contrary, a good situation, conceived according to this metaphor, implies access to otherwise hidden or inaccessible entities. This metaphor appears in expressions like *in trouble, in need, in power, in office, in control, in command of, in a morass, in a controversy, in fellowship, in cooperation, in danger, in business, in a predicament, in disgrace, in the wrong, in retirement, in possession of, in exile, in slavery, in circumstances,* etc. Examples:

> *...raising the question of whether Republicans, if they had been in power, would have made "amateurish and monumental blunders" in Cuba. (A04:37)*
> *Extension of the ADC program to all children in need living with any relatives... (A02:87)*

5.- CAUSES contain their EFFECTS. An effect is viewed as if hidden in the container in the sense that it is not yet known when the cause is produced. Examples:

> *One advantage that would come to the city in having a full-time director, he said, is that East Providence would become eligible to apply... (A05:12)*
> *Man in a boat, there's a lot of places he can put in at and a lot of reasons he can be away for a bit. Any harm in that? (P04: 86)*
> *... the husband becomes passive in the face of his wife's aggressiveness (F08:92)*

6.- FORM is a CONTAINER FOR SUBSTANCE. This is an old metaphor according to which objects consist of two elements, a form and a substance. The form, which is perceived, contains the substance, which is not perceived. Examples:

If the content of faith is to be presented today in a form that can be "understanded [sic] of the people". (D02:1)

The governor's move into the so-called "blue law" controversy came in the form of a letter to Miss Mary R. Grant, deputy city clerk of Central Falls. (A05:26)

As a derivation of this metaphor words are contained by their grammatical form. Example:

Thus, the masculine animate infinitive <dabhumaksanigalu'ahai,> meaning <to live>, was, in the perfect tense, <ksu'u'peli'afo>, and, in the future, <mai'teipa>. (M02:141)

7.- QUALITIES ARE CONTENTS. Qualities are conceived of as being inside objects, actions, events or activities. Examples:

...there was plenty of vigor in the performance,... (C09:39)

...to the sportiest boatman who insists on all the dash, color, flair and speed possible to encompass in a single boat... (E06:35)

8.- CONDUIT metaphor. Words and language in general are conceived of as containing meaning and ideas, which travel within language from speaker to hearer. This use appears in expressions with landmarks like *word, report, resolution, speech, statement, sentence, terms, remark, message*, etc. These refer to the language itself and not to the material support of that language; otherwise it would be a case of the BOOKS are CONTAINERS metaphor. Example:

The Secretary of State himself, in his first speech, gave some idea of the tremendous march of events inside and outside the United States...(A04:16)

...I hold it impossible to compress in a sentence or two the complicated and prodigious contributions SAM RAYBURN has made. (H03:30)

9.- PEOPLE are CONTAINERS for behaviour (as air or gas), emotions (as fluids), qualities (as objects), and roles (as substance contained by the form). Example:

The fumes of progress are in his nose and the bright steel of industry towers before his eyes,... (G08:55)

To some extent the personal inadequacies that prejudices attempt to compensate for are to be found in all of us. (D10:33)

It is said that fear in human beings produces an odor that provokes animals to attack. (D07:42)

Hirsch says that he has given the role certain qualities he has observed in the city toughs of the real world (C10:74)

... a road worker with a pickaxe who somehow becomes an abstract symbol of the savage in man (C10:29)

10.- MOTIVATION CONTAINS ACTION. Action is the consequence of a previously perceived motivation. The expressions *in view of, in the interest of, in response to, in reply to, in sight of,* etc. express this sense. Examples:

It is a war to stay out of today, especially in view of the fact that President Ngo Dinh Diem apparently does not want United States troops (B06:88)

...reorganize city departments in the interest of efficiency and economy. (B07:20)

11.- EVENTS ARE CONTAINERS. Events are linguistically referred to as if containing other events, actions or participants. Examples:

... the final event in the Town Hall Festival of Music. (C07:108)

Both parties in the last election told us... (A05:55)

12.- POLITICAL ENTITIES are CONTAINERS. A nation, province, county, etc. is considered as far as its administration or politics is concerned, and not geographically. Thus, it is a container for people, laws, social conditions, etc. which are viewed in comparison to the conditions in the exterior. Examples:

...in this republic no power to restrain him by force could exist. (D05:3)

The widespread purge that has taken place the past twelve months or so among Communist leaders in the provinces gives assurance that... (B07:54)

13.- SHAPE CONTAINS OBJECT. The shape of an object or person is conceived of as containing it, or the landmark is a noun that refers to a type of shape. Examples:

it will not be long before your entire upper leg takes on a razor-sharp definition in which the muscles look like wire cables writhing and twisting under the skin! (E01:62)
He lost, but settled for a cake in the shape of a fedora. (B05:50)
Your wife's in terrible shape. (N01:102)
... your limbs begin to wither and your hair falls out in patches. (R09:20)

14.- A CATEGORY is A CONTAINER. Classes, categories, and groups contain elements. The expression *in common* is used to indicate that two or more elements are contained in a common region shared by different categories. Examples:

...seems to come to grips quite honestly with the moral problem that most commonly vexes youngsters in this age group- (C04:75)
It was interesting to note that many of these Juniors were showing dogs in various other classes at the show prior to the Finals of the Junior Class. (E05:5)
The body, senses and brain, in common with all matter, have their counterpart on each of a countless number of frequencies. (F03: 47)
...is one who is glad that the North won the War. Nobody knows how many Southerners there are in this category. (G01:40)

15.- TOKEN contains ROLE. The role played by a person, action, or object is conceived of as contained by it. Example:

Some anti-organization Democrats saw in the program an opportunity to end the bitter internal fight within the Democratic party (A07:3)

16.- ROLE contains TOKEN. The opposite relationship to the previous one. Example:

Lucia, a sensational coloratura who ran across stage while singing, and an actress immersed in her role. (C02:35)

17.- FUNCTION contains ACTION. Example:

Hogan reappeared, stopped on the hotel porch, lifted a hand in signal. (N10:125)

18.- ACTION contains FUNCTION. The expression *no use/point in V-ing* is an example of the use of this sense. Examples:

... the upper lats and serratus are worked in this fine exercise.... (E01:34)

Not that there's much use   in locking up the smokehouse and the storehouse now. (L09:12)

19.- A PICTURE is a CONTAINER. The elements in a picture are described as contained in the picture. Example:

...and then installed on Paul Larson's railroad follows the Fig& 1 scheme and is shown beginning in Fig& 7, page 65, and in the photos. (E07:35)

20.- The SIZE of an object is a CONTAINER for the object. Example:

... Tom Robinson of Marlin made up an over/under double rifle for me   in   this caliber, using the now defunct Model 90 action in 20-gauge size. (E10:16)

21.- SIGHT is a CONTAINER. The visual field of a living being contains the things seen. Example:

The car was now in sight. (L04:71)

22.- LANDMARK is a MENTAL SPACE. *Mental spaces* are packages of knowledge which are activated in the conversation in order to be used by speaker and hearer in the course of communication (Fauconnier &Turner, 1994). The unit *in* plays the role of a *space-builder* (cf. §3.8.1), since it introduces landmarks which constitute new *mental spaces* to be referred to in the conversation. *Mental spaces* do not refer to physical space, but to abstract metaphorical space (a 'package of knowledge'). If the landmark is a word that activates a domain of knowledge, then we encounter a *mental space* which constitutes a ground for further reference. Examples:

Political systems:

... name William Foster's Four Internal Contradictions in Capitalism. (K07:177)

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Culture:

Poetry for a Persian is nothing less than truth and beauty. In most Western cultures today these twins have been sent away to the libraries and museums. (G05:70)

Imaginary worlds:

...suddenly recalling that these identical details of scene, action and word had occurred to him in a dream six weeks earlier. (F03:14)

Domains of human activity:

...many of them had always felt that the most telling cues   in   psychotherapy are acoustic,... (F01:31)

Games:

... I'm always trying to find a breaking table in blackjack. (P06:124)

Literature:

In American romance, almost nothing rates higher than what the movie men have called "meeting cute". (F01:1)

The media:

Forty years ago an English writer, W& L& George, dealt with this subject   in <Eddies of the Day,>... (R06:110)

Tradition:

IN TRADITION and in poetry, the marriage bed is a place of unity and harmony. (F08:1)

Art, theatre, cinema:

...the instigation of his fourth murder victim who had said: "With your beard, dear, you ought to be in movies"! (R01:2)

Systems of measures:

Dimensions in inches, and fractions of inches will give the displacement in cubic inches. (E08:60)

Languages:

MacArthur, for some perverse, undaunted reason, had made the same remark to an Eskimo girl in Eskimo. (F01:8)

Extralinguistic situation or pragmatic space. It indicates the speaker's attitude or approach to what is said. It occurs with expressions like *in general, in principle, in particular, in fact, in effect, in the main, in all, in any case, in reality, in actuality, in point of fact.* Example:

...makes their techniques superbly useful in studying the psychiatric interview, so useful, in fact, that they have been successfully used to suggest ways to speed diagnosis... (F01:17)

23.- LANDMARK is a REFERENCE DOMAIN. In this case, the idea of *reference point* constructions is relevant (Langacker, 1993 *a*). Langacker refers to "our capacity to invoke the conception of one entity as a cognitive reference point for purposes of establishing mental contact with another" (Langacker, 1993 *a*: 1). In the case of the lexical unit *in,* the reference is made to a domain which serves as landmark within which a cognitive operation is performed. Expressions like *in this regard, in this respect, in certain aspects*, are conventionalised uses of this kind of reference. The construction *A + in + N* implies that the quality expressed by the adjective is to be considered with the landmark domain as reference. Another type of construction takes as trajector nouns like *difference, advantage, range*, or verbs like *excel, differ*, which need a domain where the comparison is to be carried out. Examples:

In certain respects defeat increased the persistent Anglophilia of the Old South." (G01:52)
The study comprised 16 male patients, ranging in age from 27 to 72. (E02:112)
Avocados, however, are very rich in nutrients. (E02:105)
 it is rich in dissolved minerals and vitamins. The school finds that the children are satisfied with smaller amounts of food since all of it is high in quality. (F04:106-107)

...Laguerre Hanover is outstanding in type and conformation – good body, plenty of heart girth, stands straight on his legs... (E09:4)

The bread baked from this mixture is light in color and fragrant in aroma. (F04:53)

24.- THEORIES are BUILDINGS: This metaphor implies that buildings are containers for people and things, but also for their components. A theory is conceived of as a building with foundations, structure, etc. Example:

In this design the anode holder is water cooled and the heat losses by conduction from the anode were... (J02:58)

8.3   Specialisation of meaning

8.3.1   Topological Configuration senses

Coincidence between trajector and landmark is perceptually prevalent over force-dynamic or functional aspects. Nevertheless, these remain in the background, and may produce distinctions that can be reflected in distinct senses of the lexical unit.

8.3.1.1 Shifts from the conceptual schema

a) Inclusion (sense 2). The term *inclusion* is not used here in its general sense, but in a restricted technical one: The trajector is found within the limits of an area or line. However, these limits are not conceptualised as an obstacle for it to leave that area or line. The control aspects are minimised. Force-dynamic aspects are not relevant either, as long as the trajector remains within the limits of that area or line. What is relevant here semantically is the loss of emphasis on the boundaries as an instrument of control, and not the two-dimensionality of the landmark. The fact that human abstract thought is able to abstract Euclidean dimensions, and consequently speak of containers as three-dimensional, areas as two-dimensional, and lines as one-dimensional, is just that: an abstraction of human thought. Natural meaning is more

embodied. What has occurred here is a focalisation on topological relations between trajector and landmark, while control features are diminished. This is illustrated in figure 8.3.

This sense appears with complements like *land, country, city, borough, suburb, park, territory, valley, forest, garden, continent, desert, island, peninsula*, etc. or proper names that designate this type of geographical area. In general, landmarks denote areas which are conceptualised as having limits like *ground, field, paths, roads, spots*. Sometimes these limits are clear-cut, sometimes they are fuzzy. In any case, they mark the region where location of the trajector demands the lexical unit *in* to express the topological relationship of coincidence which exists between both elements.

motion only within
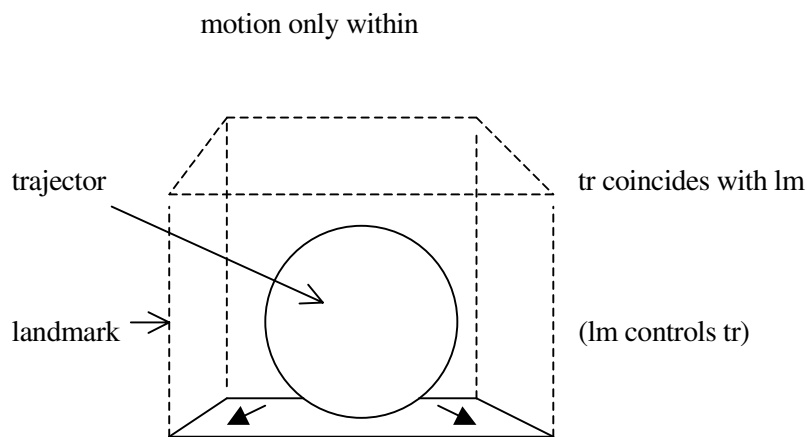
Figure 8.3. Topological inclusion

Examples:

> *.. he agreed to the need for unity in the country now. (A04:39)*
> *...that the Kennedy administration would be held responsible if the outcome in Laos was a coalition government susceptible of Communist domination. (A04:41)*
> *... five nuclear submarines will eventually be at NATO's disposal in European waters. (A04:17)*
> *... the United States will not stand for another setback in Berlin,... (A04:18)*

b) Definite inclusion (sense 2a): With certain expressions like *foreground, centre, middle, midst, dead, heart, rear, bottom*, etc. and the points of the compass, the location of the trajector within an entity with limits is defined more closely than in sense 2. This definition is given by certain landmarks that are part of the whole area (see figure 8.4). Examples:

> *Even Norway, despite daily but limited manifestations against atomic arms in the heart of this northernmost capital of the alliance, is today closer to the NATO line. (A04:10)*
>
> *...and Roosevelt gave effect to his warning by consenting to the stockpiling of poison gas in southern Italy. (F02:19)*
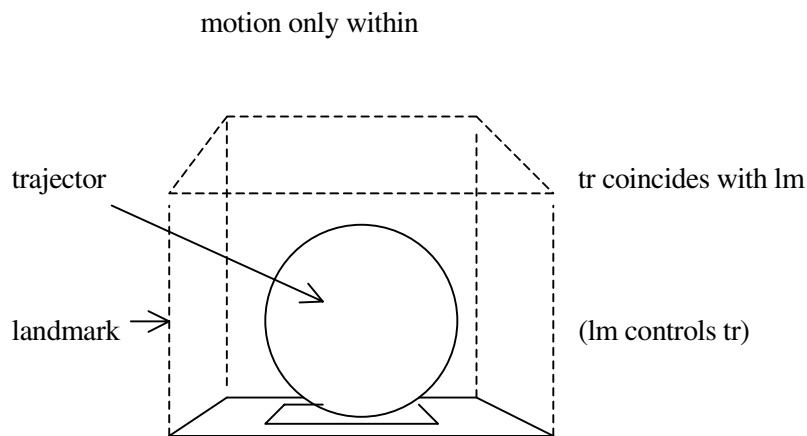
Figure 8.4. Definite topological inclusion

c) Medium (sense 2b): The term *medium* is understood as the intervening or surrounding substance, fluid, conditions or influences, i.e. the environment through which a force acts, an effect is produced, an object, living being, or another substance is preserved and exists. Whereas the idea of boundary is still present in senses 2 and 2a, it is rather bleached out in this sense. What remains here is the relationship of coincidence in space between trajector and landmark. The landmark thus becomes the medium that fills out the interior region defined by the lost boundaries. This sense occurs with complements like *the air, the sky, heaven, space, the wind, woods, jungle, weather phenomena, acoustic environment, the weather*, *climate, chemical solutions,* etc. So, the trajector is topologically perceived as coincident with the

space filled by these media. Expressions like *in the sun, in silence, in the open, in depth*, *in sunshine*, reflect this sense (see figure 8.4.). Example:

>*Their heads were in the air sniffing. (G04:3)*

The medium may also be fluids like *water, soup, wine, snow*, etc. or solid substances like *mud, soil, sand, rice, sugar, chocolate*, etc. Examples:

>*... the chicken had been marinated in brandy,... (R02:49)*
>*Seeming to have roots in the soil, they actually have none in life. (C13:47)*

Certain collocations like *in the distance, in the presence of, in the absence of, in evidence*, illustrate conventionalised expressions of this sense. Examples:

>*This was perhaps symbolic of the jazz of the evening – flashes in the distance,... (C08:31)*
>*This is especially in evidence among the present generation of the suburban middle class. (D02:14)*
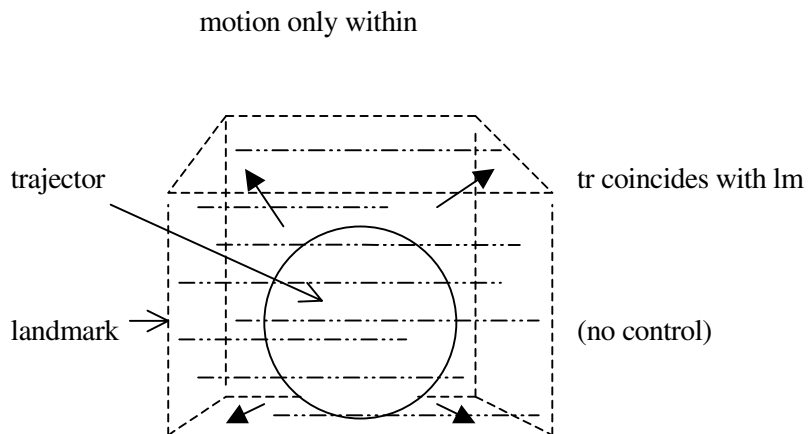
Figure 8.5: Medium

d) Material (sense 2c). Entities that are made of a material are spoken of as if included in a medium filled with that material. Colours are conceptualised as materials in this sense. So, we can find *a statue in marble, a coin in gold*, etc. Examples:

...not actually crewel embroidery, it has that look with its over-stitched raised pattern
in blue, pink, bronze and gold and a sauterne background. (B10:111)
...a grey and brown stone building that looks somewhat like an Oriental pagoda, with
Arabic lettering in gold and colored tile decorations... (E13:62)
The day's sun was gathering its strength in gold, and she wished she had brought
her parasol, if only to shade Doaty's flowers. (P04:126)
Rummaging through a stack of drawers nearby, you unearthed an antique French
chess set in ivory and sandalwood. (R09:16)

Figure 8.6: Material

e) Massive medium (sense 2d). An entity is entirely or partly located in a massive chunk of
material like *a nail in a board, an ore in the rock*, etc. (see figure 8.7). Examples:

... I saw a spring with a tap in the wall on my right-.. (E13:63)
He carried the tub from the back of the house where it hung from a nail in the wall.
(N01:142)
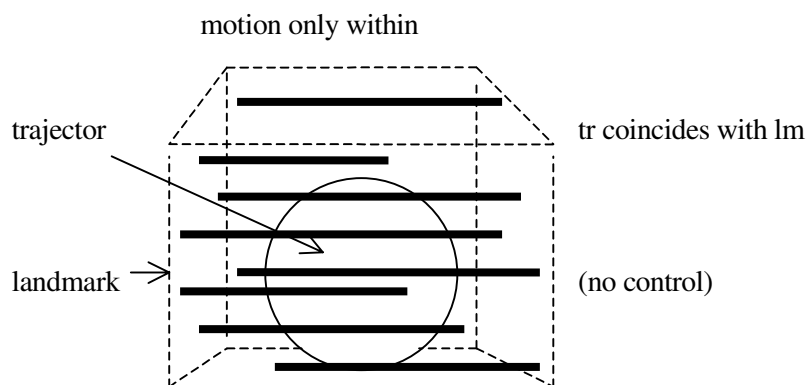
Figure 8.7: Massive Medium

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f) Integrated parts are in the whole (sense 2e). Parts of wholes which are perceived as integrated parts – not as attached or added parts – are conceived of a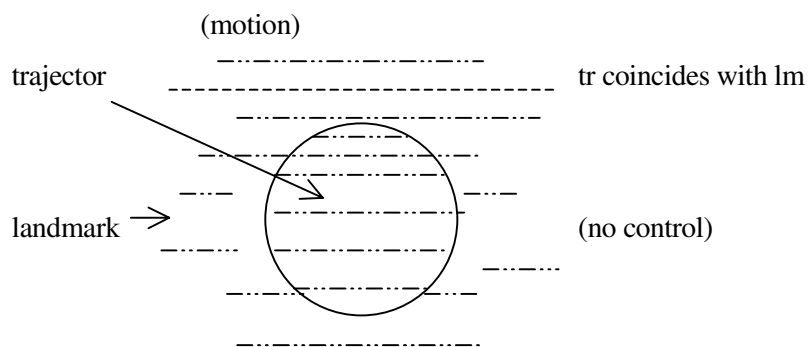s in the interior region defined by the external boundaries of the whole. The landmarks may be programmes, sets, collections, series, machines, or nouns that denote this type of complex entities. See figure 8.8.

(motion)

trajector   tr coincides with lm

landmark   (lm controls tr)
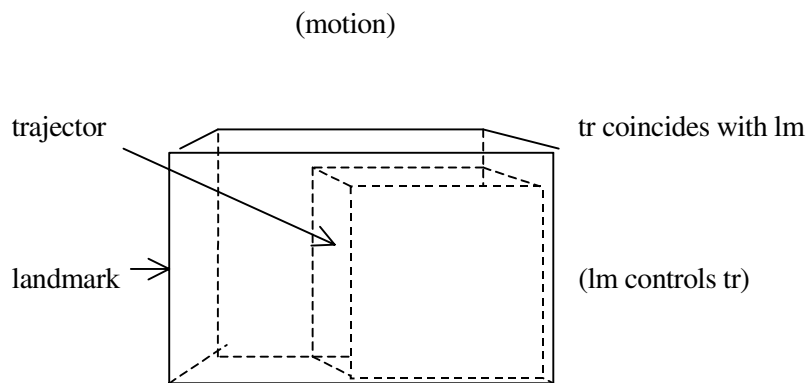
Figure 8.8: Integrated part

Examples:

...his proposals combine the "indispensable elements in a sound health program –
people, knowledge, services, facilities, and the means to pay for them. (A03:78)
The other constituents in a built detergent assist in this and in the removal of dirty
stains.... (J05:56)

g) Lack of a part is a part itself.(sense 2eα) An interruption in a whole is seen as a part of the whole (see figure 8.9). For example *a crack in the wall, a hole in a box, lack in personnel, vacancies in a hotel, openings, notches, defects*, etc. Examples:

... and continued toward a gate in the wall ahead. (E13:61)
...painter (was it Salvador Dali?) who first conceived the startling fancy of a picture
window in the abdomen. That is, it is literally a picture window: you don't see into
the viscera; (C05:45)

The City Purchasing Department, the jury said, "is lacking in experienced clerical personnel as a result of city personnel policies". (A01:9)

(motion)
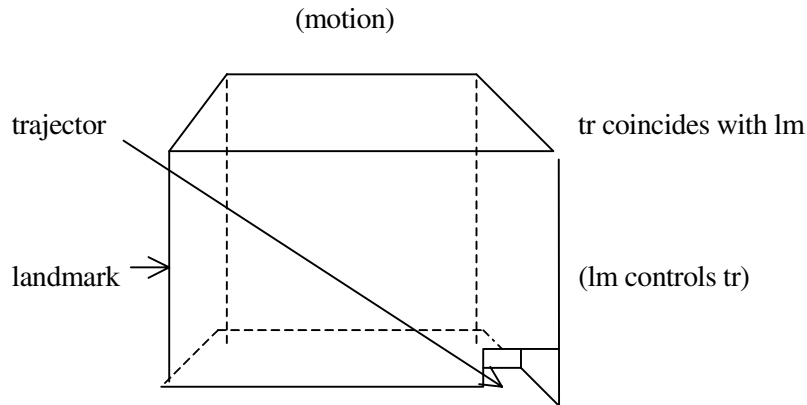
Figure 8.9. Lack of part is a part

8.3.1.2 Metaphorical extensions of the topological senses

1.- LIGHT is a FLUID. Light is conceived of as a fluid medium where other entities are located, for example *in the light, shadow, daylight, dawn, moonlight, darkness*, etc. Example:

> *... an August afternoon in the shade of the curbside trees,... (G14:50)*

2.- TOPICS are a SUBSTANCE. A topic is conceived of as a medium in which the speaker finds himself epistemologically. This usually occurs with the word *matter*. Example:

> *His sense of urgency in this matter stems from the fact that court cases ond juvenile arrests have more than doubled since... (A04:72)*

3.- A GROUP OF PEOPLE is a MASS. This metaphor occurs with landmarks like *audience, crowd, assembly, army, community, population, public*, etc. Example:

> *In the audience a man named Ferguson lost his head... (K05:165)*
> *Some can be lonely in a crowd", Nogol said elaborately. (M04:24)*

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4.- NUMBERS are part of BIGGER NUMBERS. Example:

> *...he would be willing to bet that not more than one person in a hundred would know*
> *what to do or where to go in the event of an enemy attack. (A05:16)*

5.- KNOWLEDGE is a LAND. We use this metaphor when we speak of areas or fields of knowledge. Example:

> *A person with a master's degree in physics, chemistry, math or English,... (A02:68)*
> *...the 540 million dollars [...] for direct government research in medicine. (A03:77)*

6.- SCALE METAPHOR. For example in the expressions *in excess, in large part, in large degree, in order to, in addition to, in the range of, in low concentration,* etc. The trajector is conceived of as located in some place within a scale. Example:

> *The 1960 tax book for East Greenwich indicates a valuation for this property   in*
> *excess of two million dollars. (B15:11)*
> *The thermal exchange of chlorine between [...] is readily measurable at temperatures*
> *in the range of 180` and above. (J06:1)*
> *... the wide variety of nonparticulate materials which give color even when present in*
> *very low concentration on the soiled object. (J05:41)*

7.- PUBLIC LIFE is a LAND divided into fields, areas, etc. Example:

> *Its spokesmen insist that there has not been time enough to institute reforms   in*
> *military and economic aid policies in the critical areas. (A04:32)*

8.- INTERPERSONAL CONDITIONS are WEATHER CONDITIONS. The relationships between people take place in an emotional medium. Example:

> *In Oslo, the ministers have met in a climate of candor,... (A04:3)*
> *...boy-meets-girl seems more adorable if it doesn't take place in an atmosphere of*
> *correct and acute boredom. (F01:1)*

9.- DISCOURSE IS A SPACE. A text is a medium where the different linguistic elements are located in a relative position to each other. Certain idiomatic expressions in the function of conjunct or disjunct refer to this space, such as *in addition, in consequence, in short, in other words, in a sentence, in the first place, in the one hand – in the other hand,* etc. Examples:

> *Last season, the Comedie's two principal experiments came to grief, and, in consequence, we can expect fairly soon to see still newer productions... (C10:43)*
> *In other words, like automation machines designed to work in tandem, they shared the same programming,... (F01: 7)*

10.- TIME METAPHOR. *In* is used in a temporal sense to indicate that some event, entity, action, state, etc. coincides with a span of time which is included in a larger span. The smaller span is a piece of the larger period. Therefore, *in* is used with complements referring to periods which include at least three smaller periods: the period we refer to with the trajector, one period before it, and another period after it. Landmarks are periods which may be conceived of as including the three subperiods, like *weeks, days, months, years, seasons of the year, parts of the day, periods of human life like childhood, life itself as a period, hours, minutes, seconds* (in hyperbolic use), etc. and periods in general. Idiomatic expressions like *in time, in due time, once in a while, in the meantime, in advance* occur. Examples:

> *..., since a new ad hoc NATO committee has been set up so that in the future such topics as Angola will be discussed in advance. (A04:8)*
> *The Federal program eventually should have a favorable impact on Missouri's depressed areas, and in the long run that will benefit St& Louis as well. (B06:17)*
> *The outcome of such an experiment has been in due time the acceptance of the Bible as the Word of God... (D06:16)*

A special use of the time metaphor takes into account only two of the three possible periods included in the landmark. The period occupied by the trajector coincides in this case with the end of the period denoted by the landmark (see figure 8.10). Example:

> *I was back in ten minutes. (L02:6)*

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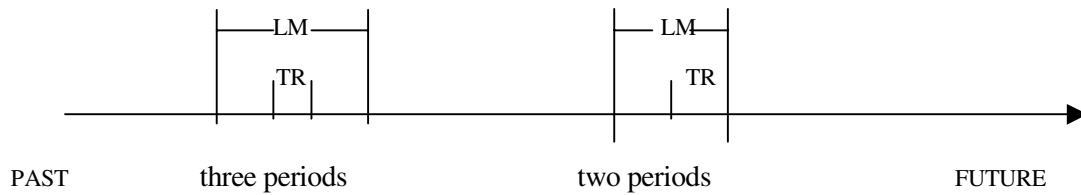
FIGURE 8.10: Periods included in temporal landmarks with *in*.

11.- An EMOTION is a MEDIUM for people. People are conceived of as immersed in emotional states like *in love, in ecstasy, in awe, in amazement, in merriment, in panic, in a thrill, in fear, in desperation, in hope, in a fit of anger, in horror, in dismay, in pleasure, in surprise, in enthusiasm, in sympathy, in pain*. Examples:

> *In the fevered, intoxicating, breathless state of being in love the usual signposts that guide you to lasting and satisfying relationships... (B08:79)*
> *Certain this menace was only imaginary, he yet stared in fascinated horror, his hand sticky against the stock of his weapon. (K02:97)*

12.- An INDIVIDUAL STATE is a MEDIUM. People are immersed in different kinds of states, which are not necessarily emotional. This is seen in expressions like *in an attempt to, in an effort, in a mood, in slumber, in mercy, in a rush, in earnest, in faith, in disobedience, in sin, in disbelief, in a spirit, in disagreement, in sleep, in error, in expectation, in laughter, in an endeavour, in consciousness, in a trance ,in a (good/bad) condition, in ignorance, in a hurry, in agreement, in wisdom, in blame*, etc. Examples:

> *... his colleagues in the Cabinet were shaking their heads in disagreement. (B05:64)*
> *O Blessed Virgin Mary, Mother of God and our most gentle queen and mother, look down in mercy upon England,... (D03:46)*

Plants or animals may also be immersed in individual states. Example:

> *...or otherwise a good sloe tree, or perhaps some nice pussy willow in bloom, preferably one with male or staminate catkins. (J10:8)*
> *Or the bay of female dogs in heat. (P01:6)*

13.- Concepts are part of concepts. Certain concepts are understood as a compound of several simpler concepts (for example, a budget implies a purpose, time, money, etc.). Example:

> *... he will also propose increasing, by an unspecified amount, the 540 million dollars in the 1961-62 budget for direct government research in medicine. (A03:77)*
> *The concept of unity, [...], in which good and evil are relative, ever-changing, and always joined to the same phenomenon. (D01:55)*

14.- Actions and participants are part of more complex actions. Example:

> *How effective have Kennedy administration first foreign policy decisions been in dealing with Communist aggression? (A04:33)*
> *He feels very forcibly that the American Kennel Club should take a MORE ACTIVE part in encouraging the Junior Division! (E05:34)*
> *He is at his usual best in exposing the shams and self-deceptions of political and diplomatic life... (C05:53)*

15.- A group is a whole and its members are parts of it. For example, members of a family, the staff of a company, the cast of a play, an orchestra, etc. Examples:

> *You may know that you are in God's family. (D06:42)*

16.- A quality is a medium. Objects or living beings are conceptualised as immersed in their qualities. Examples:

> *In the fullness of her vocal splendor, she could sing magnificently. (C02:39)*
> *The garden below was lacy with dew and enchanting in its small wildness. (P04:30)*

17.- An activity is a medium where people are immersed. Examples:

> *Authorities believe that many of the Doctor Frauds using these false health gadgets are still in business. (F10:45)*

As for his private monies, they were rapidly dissipated in drinking, gaming and carousing. (R03:37)

18.- SOCIAL LIFE is a MEDIUM. People are seen as immersed in social life. Examples:

She had been moving in cafe society as Lady Diana Harrington... (F09:11)

8.3.2   Force-dynamic configuration senses

If the force dynamic configuration of the participants in the situation is profiled, new senses of *in* occur. The interaction axis between trajector and landmark is highlighted as the central aspect of the relation. Other aspects like the topological relation of coincidence and the functional orientation remain in the background, but are still present. *In* is compatible in context with other linguistic units which express motion along a path which ends in the interior of a landmark. Further senses are derived from the central force-dynamic sense when the background attributes reappear, or the orientation of the interaction varies (axis rotation).

8.3.2.1 Shifts from the conceptual schema

a) Movement from the outside (sense 3). The trajector defines a path towards the interior region defined by a container, or towards the space filled out by a medium, or towards the interior defined by the limits of an area (see figure 8.11 below).
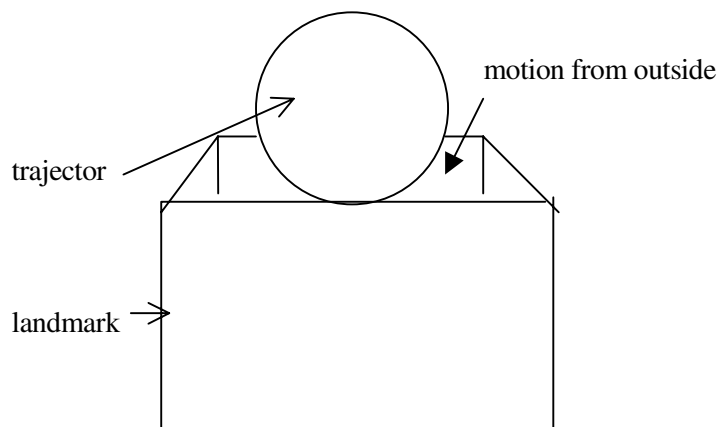
Figure 8.11: Motion into container

This sense occurs in context with verbs of movement like *place, put, set, introduce, confine, shut, lock, fall, hide*, etc. Verbs like *merge, sink, dive, plunge, immerse* are also possible when the movement ends in a medium. The verb indicates the manner of the movement and the unit *in* indicates the direction of that movement (see Talmy, 1987) in relation to the interior region of a landmark. Examples:

> ... *put the money in an envelope under the old woman's purse there in the drawer.*
> *(L08:100)*
> ...*newsletters, speeches and other literature to be dropped in every letter box*
> *(B07:75)*
> *It was a session at which all the youngsters were told to express their fears, to get*
> *them out in the open where they could talk about them freely... (D07:3)*
> *Perhaps one bored holes in the stone with some kind of an electric gadget. (R04:59)*
> (into lack of part).

b) Trajector becomes integrated part of landmark (sense 3a). In this case, the motion ends in a fusion of trajector and landmark. Verbs like *insert, install, implant, incorporate, fit in, take in, include, carve in* occur with this sense (see figure 8.12 below):
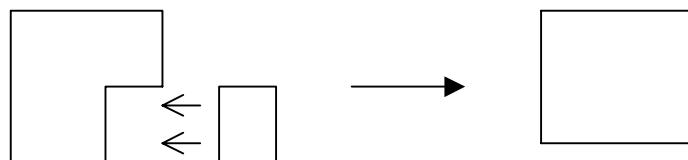
Figure 8.12: Trajector becomes an integrated part of landmark

Examples:

> ...*the army general staff, led by Gen& Cedvet Sunay, had set a deadline for the parties*
> *to join in a national coalition government. (A09:91)*
> ...*the rocky hills south of Grass Valley. They had spent a million dollars, carving in*
> *a road, putting up buildings, drilling their haulage tunnel. (N07:100)*
> *Sometimes I think you need only one rule for cooking: if you can't put garlic*
> *in it, put chocolate in it. (R02:94)*

c) Commotion, or movement of integrated parts (sense 3b). Integrated parts of the landmark move producing some effect. The result is a change in the nature of the landmark. See figure 8.13. This happens with expressions like *increase, raise, reduction, gain, upturn, improvement, rise, cut, diminish, falling off, growth, diminution, upsurge, revolution*, etc. followed by *in*. Example:

> *...possibly detect changes in the structure or composition of the lunar surface material. (J01:20)*
> *...must sputter away the surface atoms of the dust and cause a slow diminution in size, with a resultant increase in both the Poynting-Robertson effect and the ratio of the repulsive force to the gravitational force. (J07:4)*
> *Both parties in the last election told us that we need a five per cent growth in the gross national product – but neither told us how to achieve it. (A05:55)*
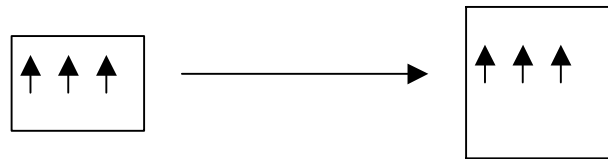
Figure 8.13: Commotion

d) Imaginary motion into a part of trajector (sense 3c). The speaker performs a scanning of the trajector, so that perception moves from one part of the trajector to another. See figure 8.14. The latter constitutes the landmark of the expression. This sense occurs with expressions of the type *end in* (*A pencil ending in a sharp point*)*, culminate in,* etc.
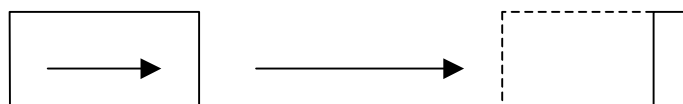
Figure 8.14: Imaginary motion into a part of trajector

Example:

...Christ as the second Adam, who does indeed come to destroy sin, but whose work culminates in the achievement of immortality. (D04:60)

e) Motion attempting to cross the boundary into the interior region of a container or to come into a massive medium (sense 3d). This sense often describes violent movements of objects which crash against the surface of other objects. However, the interior region is not reached (see figure 8.15 below):
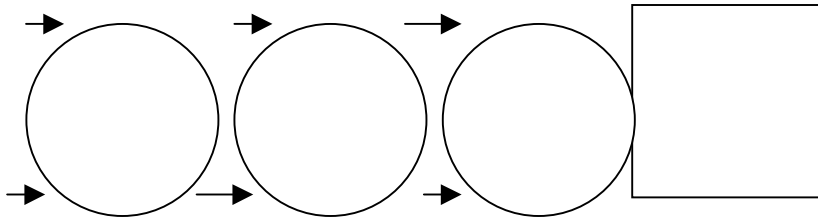
Figure 8.15: Attempt to reach interior

Examples:

Pressing his cigarette out in the earth, Warren walked to the slit... (K02:25)
...Roberts' full weight struck him at that moment in the groin. (L06:7)
A painful stab hit him in the abdomen. (M06:23)

f) Trajector becomes a group (sense 3e). The movement of the trajector consists of becoming a plurality of entities within a group. Example:

Reaching for an old clay pot, relic of pioneer days, he tore the envelope in pieces, dropping them into it,... (P03:46)

8.3.2.2 Metaphorical extensions of the force-dynamic senses

1.- SEEING is ENTERING. With verbs like *look, stare*, etc. and complements like *the eyes*, *the face*, etc., to denote that the person who looks wants to go into the other person's feelings, thoughts, etc., or with other objects to denote searching in the interior. Examples:

> *Mike crawled to the door and peered in. (N03:144)*
>
> *Look in this book for weak mortals and only on occasion for virtues and vices on the heroic scale. (C05:85)*

2.- ACTIONS are PIERCING MOVEMENTS. This sense occurs when gestures are intended to affect the feelings or the behaviour of another person. Verbs like *laugh, shut the door, slam the door, shake one's fist*, generally followed by the lexical unit *in* and a noun referring to human beings, or by the expression *in someone's face*. Example:

> *"A learned man"? the bandit laughs in his face. (K08:5)*

3.- The EAR is a CONTAINER for speech sounds. This metaphor occurs with verbs like *speak, murmur, whisper, shout*, etc. followed by the expression *in the ear.* Example:

> *Manuel whispered in the ears of the Sioux that the Cheyennes were comin' to raid 'em for their horses. (N04:29)*

4.- INTENTIONAL STATES are MOVEMENTS. This metaphor interprets people's intentional states as movements towards an aim, target, or the final point of the state, which are seen as an interior region of another entity. It occurs in expressions like *interest in, confidence in, be in favour of, believe in, have faith in, engage in, acquiesce in, trust in, be involved in, confide in, concern in, indulge in, in support of,* etc. Examples:

> *When that fear has been removed by faith in Jesus Christ, when we know that He is our Savior, that He has paid our debt with His blood, that He... (D07:101)*
>
> *...speaking out against the home rule charter in favor of the model municipal league charter. (A05:75)*
>
> *The United States, State Department officials explain, now is mainly interested in setting up an international inspection system... (A04:25)*
>
> *The President asks the support and cooperation of Congress in his efforts through the enactment of legislation... (A04:69)*

5.- PURPOSES are DESTINATIONS. According to the Event Structure Metaphor (Lakoff, 1993), purposes of action are seen as destinations at the end of a path. In this case, the path ends in

an interior region defined by a container or a medium. This metaphor occurs in expressions like *in + present participle, step in, do something in favour of, succeed in, grant-in-aid, lead in, to have a point in, progress in, help in, aid in,* etc. Examples:

> *... will be the first step in obtaining a home rule charter for the town. (A05:59)*
> *And in the dark days after the Great Flood of 1927 [...] the little plane was its sole replacement in carrying the United States mails. (F05:9)*

6.- ACTIONS are SELF-PROPELLED MOVEMENTS: An action or activity is conceived of as a movement that follows a path towards an object. It occurs in expressions like *intervene in, specialise in, experiment in, assist in, participate in, invest in, train in, instruct in, cooperate in,* etc. Examples:

> *...Parker "should not be encouraged nor assisted in diffusing his opinions by those who differ from him in regard to their correctness. (D05:4)*
> *At Berger's direction, the city also intervened in the Hughes bankruptcy case in U.S. District Court. (A09:16)*

7.- RESULTS are DESTINATIONS. With expressions like *result in, end in*, etc. Examples:

> *It sometimes ended in death-like trances with many lying exhausted and panting on chair and floor. (K04:26)*
> *...programing and budgeting completely beyond the capabilities of the recipient country would result in the frustration of the basic objective of our development assistance to encourage more rapid growth. (H02:13)*

8.3.3 Functional configuration senses

The relation of functionality, i.e. control exerted by landmark, is highlighted. Force-dynamic configuration and topological relationships remain in the background. These can provide an element for contrast with other lexical units that might occur in the same contexts as *in*, i.e. where functional relationships between the participants are predominant semantically.

8.3.3.1 Shifts from the conceptual schema

a) Control (sense 4). Partial sanction of the *conceptual schema* may produce a focalisation on its control aspects. In this case, motion or action of the trajector is controlled in a certain way by the action of the landmark, by its presence, or by its mere existence. See figure 8.16.
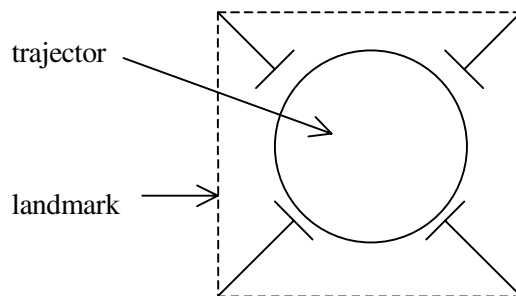
Figure 8.16: Landmark controls trajector

The control instruments which are closest to human beings are their hands and arms. Thus expressions like *in hand, hand in hand, in the hold of, in someone's hands, in someone's arms, in someone's control, in the grip of*, are the most salient expressions of this sense. Others imply some control by means of an instrument like *in harness, in handcuffs, in the stirrup*, etc. Examples:

> *... the audience is nevertheless left in the grip of the terrible power and potency of that which came over Salem. (D01:58)*
> *A man with a baby in his arms stood there pleading for his wife who is on the other side with the rest of the family. (D07:61)*
> *There was good fortune and there was bad and Philip Spencer, in handcuffs and ankle irons, knew it to be a truth. (P07:117)*

Another pattern of the control use are verbs like *reside, be, rest, lie*, etc. followed by *in,* where the referent of the subject of the clause is controlled by the landmark. Example:

> *The danger lay not in believing that our own A-bombs would deter Russia's use of hers; that theory was and is sound. (B01:30)*
> *The source of this paradox is not difficult to identify. It lies in institutions. (D10:8)*

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b) Path controls movement (sense 3-4). Partial sanction may put emphasis on two of the conceptual configurations. When both control and motion are stressed a sense appears which can be located between the conceptual regions of control and motion. In this case, the trajector is moving along a path and the trajectory of that path defines the movement. This is linguistically expressed with the lexical unit *in* followed by nouns that denote types of trajectory: *in a line, in a move, in a motion, in progress, in the search for, in an ellipse, in an orbit, in a direction, in due course, in progression, in a sequence, in the wake of, in succession, in circulation, in the course of*, etc. (see figure 8.17). Examples:

It moved in a silver arc toward his throat, then veered downward. (L06:41)

The annual spring meeting has given an impetus in three main directions... (A04:20)
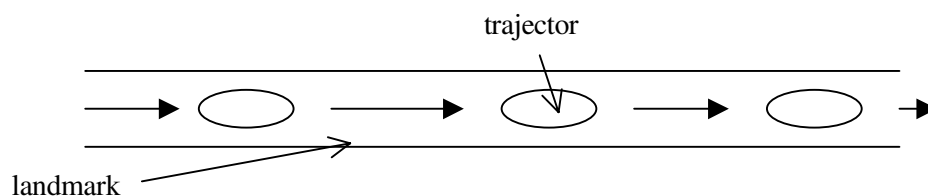
Figure 8.17: Path controls movement

8.3.3.2 Metaphorical extensions of functional senses

a) MANNER controls ACTION. This occurs in expressions like, *in a manner, in a style, in a sense, in force, in particular, in a tempo, in a mood, in a fashion, in a way, in one's stride*, where manners, fashions, ways, etc. guide, lead, or control action. Example:

Indicating the way in which he has turned his back on his 1910 philosophy,... (A05:57)

"Look, he took everything I had"! Mr& Khrushchev was jesting in the expansive mood of the successful banker. (A07:71)

...opinion arose between Mr& Martinelli and John P& Bourcier, town solicitor, over the exact manner in which the vote is handled. (A05:64)

b) Institutions that exert some control over the people who belong to them, work for them or have any relationship with them. Expressions like *in prison, in the army*, *in school, in hospital*, *in court*, etc. illustrate this pattern. Examples:

> *... a certificate of correctness, violation of which would carry a penalty of one to five years in prison, plus a $1,000 fine. (A02:39)*
> *She felt like a fool, too. It hadn't been this way in college, or in nurses' training; it wasn't this way in the hospital at San Diego. (P05:55)*

c) States or situations in which people, animals, or plants are under other people's supervision or control, like *in quarantine, in custody, in care, in secret, in observation,* etc. Examples:

> *The Director, Walter E& Clark, believes that a school with children living full time in its care must take full responsibility for their welfare. (F04:9)*
> *Caught at last, he was sentenced to prison. While he was in custody his wife divorced him. (F08:38)*

d) Position controls trajector. This sense appears in expressions that provide a kind of position or situation as a landmark. This landmark determines the potential of action or movement of the trajector. It occurs in expressions like *in opposition, in touch, in a position, in a situation, in contact, in combination, in conjunction, in relation with/to, in equilibrium, in comparison, in proportion to, in contrast, in contradiction, in analogy, in connection, in turn*, etc. Examples:

> *Does the organization show an affinity for a foreign government, political party or personality in opposition or preference to the American system? (B04:81)*
> *In such conditions all freedoms are lost. (B07:42)*

8.4   The Adverbial use of *in*

The adverbial use of *in* follows the semantic patterns described in the previous sections. It implies that the landmark of the relationship expressed by this unit is not explicit as

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complement of a preposition. The landmark may be found in the linguistic context. Otherwise it is pragmatically understood, either because it is found in the deictic context – context of situation – or because it is conventionally assumed, in which case the expression is lexicalised as an idiomatic usage. The four main sense types occur in adverbial use.

1.- Senses based on the container schema (1, 1a, 1b). Examples:

Enclosure:

> *Between the unsafe Towne field and the long round about back road haul that was necessary to gain access to Wilson flat, arrangements at the state capital were far from satisfactory. Each time* <u>*in*</u>*, the unhappy pilot, pushing his luck, begged the postal officials that met him to find a safer landing place, preferably on the flat topped hills across the Winooski river. (F05:43)*
>
> *Uh-huh. So I can hear you while I'm checkin' the car. Looks like we might be* <u>*in*</u> *for a speck of trouble. (N09:22)* (circumstantial state is container)

Partial enclosure:

> *To him they were one and the same. Sameness for the Old Man was framed* <u>*in*</u> *by a wall of ginkgo trees which divided these quarters from the city. (P01:50)*

2.- Topological senses. Very few examples appear in the BC.

Medium:

> *The spectrometer was adjusted to minimize the amount of dispersion mode mixed* <u>*in*</u> *with the absorption signal. (J04:84)*

Inclusion:

> *I stayed half a block behind him, letting lots of cars keep* <u>*in*</u> *between us, listening to the steady beep **h beep **h beep. (L02:55)*

3.- Force-dynamic senses:

a) Direction into an *enclosure, medium, area,* or *integral whole* type of landmark:

Into enclosure:

> *The car drew up alongside him and stopped. "Get* <u>*in*</u>*", Charley Estes said brusquely. He staggered into the back seat and lay back,... (L04:154)* (vehicle)
> *He was standing at the end of the bar enjoying a slug of cognac when Rourke came* <u>*in*</u> *six or eight minutes later. (L05:92)* (room)
> *As he drove, he filled* <u>*in*</u> *Timothy Rourke briefly on the events of the evening after leaving the reporter to go to the Peralta (L05: 31)* (mind as container)
> *But in order to keep Letch* <u>*in*</u> *the public eye and out of trouble, I wrote* <u>*in*</u> *a part especially for him – that of a dashing ruffian..." (R03:56)* (book as container)
> *I hated the goddamn army from the first day I got* <u>*in*</u> *anyhow. (K07: 221)* (Institution as container)
> *With a short-lived sigh of relief, Jack plugged the fuses back* <u>*in*</u> *and threw the switch. (M03:123)* (into interior region)

Into medium:

> *As I dug* <u>*in*</u> *behind one of the bales we were using as protection, I grudgingly found myself agreeing with Oso's... (N04:49)*
> *Otherwise, straighten your halo, square your wings, and dig* <u>*in*</u>*. The sooner you act like an angel the quicker you'll feel angelic. (M01:136)*
> *At last, sitting there,* <u>*in*</u> *the familiar surroundings, the truth began to sink* <u>*in*</u>*. (L10:80)*
> *Resolving to get something done, I started* <u>*in*</u> *on the dishes. (R02:15)*

Into area:

> *Man in a boat, there's a lot of places he can put* <u>*in*</u> *at and a lot of reasons he can be away for a bit. (P04:85)*

...he crossed the bridge at the Falls and took the River Road to LaSalle and, finally, turned in at their own driveway at 387 Heather Heights. (L03:155)

Into a whole:

He put in a call to Cunningham from his hotel room. (L07:1)
...the river was being held for an eventual development for white working people who were coming in, and that none would be sold to colored folk. (K04:81) (a community as a whole)

b) Commotion:

*He stared at it, amazed, alarmed **h. <The whole fucken sky's cavin in!   Keeeerist! Lookit it! Cover the whole building, bury us all, by nightfall. (K07:133)*

c) Attempt to come into landmark (it may indicate aggression):

The old nightmare which had caused him so many wakeful hours came charging in on him once more, only this time he couldn't pacify it with a sleeping pill and send it away. (R04:54)

d) Trajector becomes part of landmark:

... in the rocky hills south of Grass Valley. They had spent a million dollars, carving in a road, putting up buildings, drilling their haulage tunnel... (N07:100)

4.- Control senses:

...who have not been able to get relief from regular medical doctors are especially apt to be taken in by quacks. (F10:95) (mind control through persuasion)
...immediately was put into harness and line-driven for a few days, and then put to cart and broken in   very nicely, knowing nothing but trot. (E09:19) (will control through aggression)

They reined in before the town marshal's office, a box-sized building on Main Street. (N10:107) (speed control through hauling the rein)

They closed in fast, kept him from reaching inside his coat for his gun. (N10:135) (movement control through seclusion)

...but Hope said if Grandma wouldn't have the heater nobody would have it, so Grandma had to give in. (P02:88) (indulge into control by others)

The hypothesis that the semantic structure of a single lexical unit does not vary, no matter how diverse its syntactic use, is illustrated by means of this selection of examples in adverbial usage. However, this hypothesis needs further testing, which was not possible in this work, because the occurrence of *in* as well as *on* in adverbial use was rather reduced in the sample utilised.

8.5   A radial category for in

The different senses of the radial category of the lexical unit *in* have been illustrated in the previous sections. The primigenial sense (sense 1) combines the three modes of spatial configuration: topology, force-dynamics and function. The *conceptual schema* combines, therefore, topological inclusion with a relation of control of the trajector by the landmark, as well as a kinetic axis characterised as not exiting the interior region of the landmark. This sense is called here *enclosure* and responds to the basic logic of the container image-schema (Lakoff, 1987; Fornés y Ruiz de Mendoza, forthcoming). The *conceptual schema* undergoes two shifts: *partial enclosure* and *interior is landmark*. *Partial enclosure* implies the loss of some of the boundaries that define the container, so that the control of the landmark over the trajector is reduced. At the same time the protective aspects of the control prime over the isolation of the trajector. *Interior is landmark* implies an even weaker role of the boundaries and only the space defined as an interior region is emphasised. These two shifts will produce two chains of senses within the conceptual region of the topological configuration. In the *partial enclosure* chain, boundaries will be relevant to a certain extent. In the *interior is landmark* chain, the interior region is relevant. Both chains give origin to a prototype each. The chain where boundaries are relevant produces a main sense here called *inclusion*. In this

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case boundaries are reduced to the limits of an area, which becomes the landmark itself. When a part of this area is made explicit we get a new sense called *definite inclusion*. The chain goes on to give emphasis to parts of wholes. Finally, the lack of a part in the whole is also expressed by a new sense of the lexical unit *in*. The second chain produces a prototype called *medium*, where the interior region of a container is conceptualised as filled out by some matter. At the same time boundaries are no longer an active part of the conceptualisation. The trajector is conceived as immersed in the medium. Trajectors are easily conceptualised as immersed in gaseous or liquid media. This conceptualisation changes when the medium is a substance like sugar, rice, etc. In this case, the trajector is covered with it, but not completely immersed in it. A new sense is posited for that conceptualisation where an object is made out of some material, as if it were included in a medium of that material. At the end of this chain a sense called *massive medium* stands for a conceptualisation where the trajector is in a massive chunk of matter, completely or in part.

The primigenial image-schema gives rise to two chains where the force-dynamic configuration is the most relevant factor in the conceptualisation. In one of them, movements within the landmark are conceptualised as *commotion* of integrated elements, and in the other, as *imaginary motion* or scanning of internal parts. The other chain represents conceptualisations where trajectors come from the external space into the interior region defined by the boundaries of the landmark. *Motion from outside* is the central sense here which coincides with the meaning of the unit *into*. The lexical unit *in* is used with this sense mainly in adverbial positions, but also sometimes as a preposition. Two senses follow from this one, which differ from the prototypical sense of *into*. One of them implies that the *trajector becomes an integrated part* of the landmark. This sense is found in the intersection of the topological and the force-dynamic conceptual regions. Partial sanction of the *motion from outside* sense leads to the farthest sense in the chain, called *attempt to reach interior,* where the final stage of the movement is not accomplished, i.e. the interior region is not reached.

Finally, partial sanction of the *conceptual schema* focuses on control aspects to give rise to a conceptualisation where the control of the landmark over the trajector is emphasised. Partial sanction may also focus on control and movement at the same time, producing a further

sense, where the landmark is conceived of as a path for movement which controls that movement.

Conceptual regions represent a progressive loss of grounding on physical experience. The central triangle represents primigenial physical experience with containers, and gives rise to the *conceptual schema*. Distance between squares in figure no. 8.18 roughly stands for conceptual distance between senses.

At the same time, a chain will be closer to the adjacent conceptual region if the senses represented in it incorporate that configuration as secondary. The senses represented in the radial category are not clear-cut categories, but they should be seen as merging into each other. The analysis of a large number of examples provides evidence for the fact that many instances could not be clearly identified with one single sense. On the contrary, they show semantic aspects that could be assigned to two closely related senses.

Topological
configuration

Force-dynamic
configuration

3e Tr becomes a group

3c Imaginary motion into part

2eα Lack of part

2d Massive medium

3a Tr becomes part of lm

2e Integrated part

2c Material

3b Commotion

3d Attempt to
reach interior

2b Medium

1b Interior
is lm

3 Motion from
outside

2a Definite
inclusion

2 Inclusion

1a Partial
enclosure

1
enclosure

3-4 Lm controls
movement

4 Lm controls tr
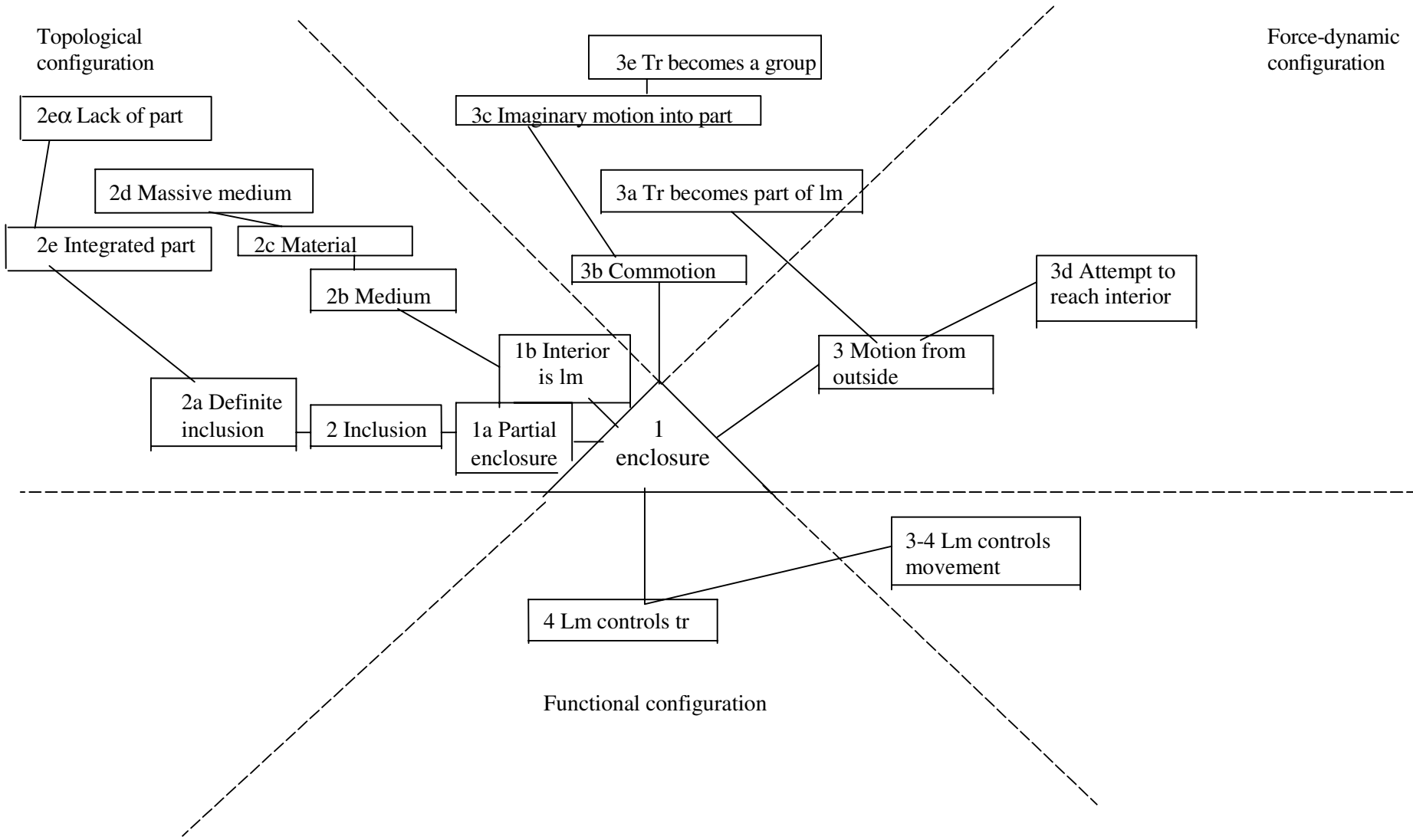
Functional configuration

Figure 8.18: Radial category for *in*

8.6   Conclusions

The polysemy of the lexical unit *in* turns out to be a quite complex integrated system. The former controversy on the nature of the landmark as a container or a medium might be superseded by a conception with more than one prototype. It is shown that the lexical unit *in* gives predominance to a topological configuration in the conceptualisation of the relationship between trajector and landmark (35.26%). Apart from the *conceptual schema*, here called *enclosure* (40.83%), which is based on the container schema, two more prototypes can be posited, and both have the topological configuration as their central element. The senses *inclusion* and *medium* constitute new prototypes that give origin to chains of senses themselves. The three-dimensionality of the landmark is not considered as a relevant semantic feature for the description of the semantic category. On the contrary landmarks of *in* are found which can be conceived of as three-, two- or one-dimensional.

The *enclosure* prototype subsumes the three semantic aspects of the spatial conceptualisation of *in*: the trajector coincides with the interior region defined by the landmark; the trajector moves within that interior region, or does not move at all; and finally, the landmark exerts control over the trajector, either offering protection to the trajector by preventing access of external entities to it, or maintaining it in isolation by preventing its access to the exterior.

The *medium* and the *inclusion* prototypes both put an emphasis on topological coincidence of the trajector with the interior region defined by the landmark. The former puts the emphasis on the interior region itself, whereas the latter puts the emphasis on the boundaries. In both, the control and force-dynamic aspects lose their relevance.

Table 8.1: Absolute frequencies and percentages of non-metaphorical *in*-senses.[46]

SENSE	ABSOLUTE FREQUENCY	PERCENTAGE
Enclosure	520	24.22
Partial enclosure	150	6.99
Interior is landmark	39	1.82
Topological inclusion	631	29.39
Definite inclusion	62	2.89
Integrated part is trajector	80	3.73
Lack of part is trajector	28	1.3
Medium	228	10.62
Material	12	0.56
Massive medium	8	0.37
Motion into landmark	149	6.94
Commotion	62	2.89
Imaginary motion	9	0.42
Tr becomes integrated part of lm	14	0.65
Tr becomes a plurality of parts	2	0.09
Control	78	3.63
Path of motion controls tr	75	3.49
Total non metaphorical uses	2147	100

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[46] The quantitative analysis of *in*-senses has been made on the first ten texts of each type in the sample.

Table 8.2: Absolute frequency of senses metaphorically and metonymically extended from the conceptual schema, and percentage:

METAPHOR / METONYMY	ABSOLUTE FREQUENCY	PERCENTAGE
CONDUIT METAPHOR	81	6.81
FORM CONTAINS SUBSTANCE OR CONTENT	55	4.63
MIND IS A CONTAINER	45	3.78
BOOKS ARE CONTAINERS	143	12.03
INSTITUTIONS ARE CONTAINERS	79	6.64
CIRCUMSTANTIAL STATES ARE CONTAINERS	70	5.89
CAUSES CONTAIN EFFECTS	22	1.85
MOTIVATION CONTAINS ACTION	22	1.85
QUALITIES ARE CONTENTS	54	4.54
A PERSON IS A CONTAINER	35	2.94
EVENTS ARE CONTAINERS	198	16.65
POLITICAL ENTITIES ARE CONTAINERS	24	2.02
ACTION CONTAINS FUNCTION	14	1.18
CATEGORY IS A CONTAINER	22	1.85
SHAPE CONTAINS OBJECT	13	1.09
TOKEN CONTAINS ROLE	4	0.34
ROLE CONTAINS TOKEN	11	0.93
BUDGET IS A CONTAINER FOR MONEY	4	0.34
SIZE CONTAINS OBJECT	6	0.5
PICTURE IS CONTAINER	30	2.52
SIGHT IS A CONTAINER	6	0.5
FUNCTION CONTAINS ACTION	1	0.08
THEORIES ARE BUILDINGS	2	0.17
MENTAL SPACES	109	9.17
ILLOCUTIONARY USES	50	4.20
REFERENCE DOMAIN	89	7.49
Total metaphorical uses	1189	100

Table 8.3: Absolute frequency and percentage of senses metaphorically extended from topological senses:

METAPHOR / METONYMY	ABSOLUTE FREQUENCY	PERCENTAGE
SCALE METAPHOR	88	14.92
KNOWLEDGE IS A LAND	47	7.97
INTERPERSONAL CONDITIONS ARE A MEDIUM	12	2.03
LIGHT IS A FLUID	41	6.95
TOPICS ARE MATTER	10	1.69
PEOPLE ARE A MASS	17	2.88
PUBLIC LIFE IS A LAND	28	4.75
DISCOURSE IS SPACE	72	12.2
ACTIONS/ PARTICIPANTS ARE PART OF ACTIONS	37	6.27
PERSONAL STATES ARE A MEDIUM	114	19.32
A GROUP IS A WHOLE	23	3.9
EMOTIONS ARE A MEDIUM	42	7.12
QUALITIES ARE A MEDIUM	8	1.36
CONCEPTS ARE PARTS OF CONCEPTS	2	0.34
ACTIVITIES ARE MEDIUM	28	4.75
SOCIAL LIFE IS A MEDIUM	8	1.36
VOICE IS A MEDIUM	13	2.2
Total metaphorical uses	590	100

Table 8.4: Absolute frequency and percentage of senses metaphorically extended from motion senses:

METAPHOR / METONYMY	ABSOLUTE FREQUENCY	PERCENTAGE
SEEING IS ENTERING	5	1.7
INTENTIONAL STATES ARE MOVEMENTS	132	44.9
PURPOSES ARE DESTINATIONS	107	36.39
ACTIONS ARE SELF-PROPELLED MOVEMENTS	38	12.93
ACTIONS ARE PIERCING MOVEMENTS	1	0.34
RESULTS ARE DESTINATIONS	9	3.06
SPEAKING IS POURING	1	0.34
MARRIAGE IS A JOURNEY	1	0.34
Total metaphorical uses	294	100

Table 8.5: Absolute frequency and percentage of senses metaphorically extended from control senses:

METAPHOR / METONYMY	ABSOLUTE FREQUENCY	PERCENTAGE
MANNER CONTROLS TRAJECTOR'S ACTION	174	53.54
POSITION CONTROLS TRAJECTOR	99	30.46
STATE CONTROLS TRAJECTOR	15	4.62
INSTITUTION CONTROLS TRAJECTOR	37	11.38
Total metaphorical uses	325	100

Table 8.6. Absolute frequency and percentage of main sense types on the total sample.

USE TYPE	ABSOLUTE FREQUENCY	PERCENTAGE
Conceptual schema	1898	40,83
Topological	1639	35,26
Force-dynamic	530	11,4
Control	478	10,28
Idiomatic	69	1,48
Other	5	0,11
unclassified	39	0,62
Total **in** *uses*	4,648	100

Under the label 'other' in table 8.6, two uses are included: appositive and reflexive, which are illustrated in the following examples:

> *Then she jerked her thumb toward the door in a very American gesture .. (P05:49)*
>
> *Although the matter has not been unequivocally demonstrated, the available data*
>
> *show that micelles in themselves do not contribute significantly to the detergency*
>
> *process. (J05:64)*

Under the label 'idiomatic' those uses are included that have not been interpreted as any particular sense because their deep idiomatic character (*in front of, in spite of, in instance,* and *in back of*).

9. GENERAL CONCLUSIONS

This work offers two types of results. On the one hand, it corroborates previous results of Cognitive Linguistics (fuzzy boundaries of categories and continuum hypothesis). On the other hand, it represents a step forward in semantic description (radial networks in polysemy).

1) It has been argued that syntactic categories are not clear-cut, that there is a continuum between lexicon and grammar. Corpus analysis shows that the lexical units *at, on* and *in* do behave in idiosyncratic ways:

a) *At* appears only in prepositional constructions. This includes the prepositional particles in prepositional verbs. This coincides with previous analyses (Sroka's distributionalist account). Exceptionally, it may appear as a prefix. If the existence of a category of prepositions is assumed, then *at* is a central member of that category, since it does not show any syntactic behaviour characteristic of other categories.

b) O*n* appears mainly in prepositional constructions. In addition, it is used as a full adverb in adverbial function and as an adverbial particle of phrasal verbs. In this position it undergoes a process of grammaticalisation that consists of expressing durative aspect with verbs of activity and movement. As an adverb it has a metaphorical sense which expresses continuity. It appears as a prefix, though this use is not frequent.

c) *In* presents a wide range of morphosyntactic usages that make it controversial to categorise it on behalf of a single syntactic construction. Nevertheless, the prepositional construction is overwhelmingly more frequent than the rest. It appears as a full adverb as well as an adverbial particle of phrasal verbs. It is fairly frequent as a prefix in nouns, adjectives, and adverbs. In addition it becomes a stem that incorporates suffixes itself (inner, inning).

These results indicate that *on* and *in* present a range of uses along the grammar-lexicon continuum, some more lexical and others more grammatical. The range of *at* is much more

reduced. None of them presents case-marker meanings, which would make them similar to grammatical units. However, *on* has uses that resemble verbal morphemes when it indicates durative aspect of verbs.

The second type of results has to do with two aspects: methodology and theoretical modelling.

As far as methodology is concerned, a corpus analysis shows the partiality of introspective studies. It offers an overview of everyday usage. It shows onomasiological entrenchment and provides "unexpected" occurrences of the lexical units under analysis. Nevertheless, it cannot be assumed to be exhaustive, because particular usages may be absent from the corpus used. Frequency of a particular sense may be an indication of prototypical senses for each category.

As far as theoretical modelling is concerned, the radial network model of polysemy has been expanded in two ways:

Conceptual distance between senses is graphically represented.
Directions in semantic specialisation are shown by conceptual regions.

These conceptual regions are defined by three types of spatial configuration: topological, force-dynamic, and functional. On the one hand, this model integrates previous descriptions which used only one of these three parameters in isolation and ignored the others. On the other hand, it provides a systematic modelling for the polysemous semantic structure of lexical units that express spatial or temporal relations in English. The model is not predictive but explicative.

The centre of the network is a conceptual schema based on bodily experience. The combination of the three perceptual aspects (function, interaction and topology) gives as a result conceptual schemas of ENCOUNTER, SUPPORT and ENCLOSURE for *at*, *on* and *in* respectively. Specialisation of meaning, as found in the corpus, is explained by means of conceptual shifts as well as by diverse types of partial sanction of each conceptual schema. The results are chains of senses in the three configurational conceptual regions. Specialisation

of meaning is claimed to be language specific. It is also claimed that it determines conceptualisation of space in adults. The analysis of the corpus shows metaphorical and metonymic uses of *at*, *on* and *in* as they are used to express relationships in domains other than the spatial domain. These usages are explained by mappings according to Lakoff's metaphor theory. Though the cognitive principles are universal, the particular patterns of metaphorical and metonymic semantic extension are claimed to be culture specific. The radial networks proposed are explicative of occurrences in the corpus in a more powerful way than previous radial network models. This type of radial network cannot be emulated by sequential models in AI. The improvement of connectionist models should be necessary to simulate polysemy processing.

With respect to the initial hypothesis:

1.- *At, on* and *in* have been shown to be meaningful in all their occurrences (except for a very limited set of "unclassified" and "idiomatic" instances), no matter what the syntactic construction they appear in.

2.- These meanings have been explained according to a coherent semantic structure.

3.- This semantic structure represents polysemy, with prototypical senses and peripheral senses. For AT the sense of *coincidence* (topological configuration) has the largest onomasiological entrenchment, and this prototype does not coincide with the conceptual schema (encounter). For ON the *support* sense is both the prototype and the conceptual schema. For IN, the sense of *enclosure* (container schema) is both the conceptual schema and one of the prototypes, but there are two more prototypes, namely the senses *medium* (focus on interior) and *inclusion* (focus on boundaries).

4.- All the senses of each unit are linked with no gap in the chains.

5.- Metaphorical uses are derivable from senses based on bodily experience.

6.- The semantic structure makes apparent the mechanisms of meaning elaboration (specialisation and extension), which explain how the category extends or should extend.

Suggestions for further research:

A synchronic study like the one carried out in this dissertation can never give a complete account of grammaticalisation and lexicalisation patterns. Therefore, a diachronic study of the semantic structure of lexical units would be complementary to this work. Not only a philogenetic perspective of the history of language, but also an ontogenetic approach would complement this study.

Psycholinguistic research in first language acquisition would provide evidence of real semantic extension from preconceptual elements through conceptual schemas up to metaphorical and abstract domains.

The model could be tested in the foreign language class for teaching semantics of spatial relationships. Furthermore, psycholinguistic experimentation in second and foreign language learning would test the ontogenetic patterns of development of polysemy. It would be very interesting to compare the results of psycholinguistic experimentation both in first and foreign language acquisition of polysemy.

The elicitation of metaphorical extensions of these lexical units opens the door for new data on the study of metaphor and the conceptual system of Anglo-Saxon culture.

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Abstract:

In this dissertation, three lexical units of the English language - prepositions AT,
ON and IN - are analysed, from the point of view of Cognitive Semantics.
As for syntax, their use at different positions is shown as a proof of the lexicon-grammar
continuum hypothesis. It is thus shown that these units cannot be categorised
on the basis of a close set of necessary and sufficient features. As for semantics, a
polysemy model is introduced, which is based on prototype categorisation and radial
categories. It is shown that the meaning of each unit is present in any syntactic use.
However, this is not a unitary meaning. There is polysemy. In the model, each semantic
category has its origin in a conceptual schema which does not necessarily precede the
other senses in ontogenetic development. Three perceptual dimensions constitute the
conceptual schema: topology, force-dynamics, and function as these are perceived by
human beings in spatial relationships. Other senses are derived from the conceptual
schema by means of a partial sanction of one ore more of these dimensions. Derivations
make it possible for metaphorical mappings onto abstract domains to appear.
The semantic category AT extends from a conceptual schema called ENCOUNTER -
contiguity,
plus a horizontal-frontal force-dynamic axis, plus a function of operation of
trajector over landmark; ON extends from a conceptual schema of SUPPORT Œ contact,
vertical up-down force-dynamic axis, plus a control function of trajector over landmark;
finally, IN extends from an ENCLOSURE schema Œ inclusion, out-in force-dynamic
axis, plus a control function of landmark over trajector.
Quantitative analysis shows that prototypes do not always coincide with conceptual
schemas. For AT, contiguity uses are prototypical; for ON, support senses are
predominant; IN presents two prototypes which are labelled as *inclusion* and MEDIUM.
These two senses profile respectively two aspects of the CONTAINER image-schema,
namely the external boundaries and the interior .

Resum:

En aquesta tesi s'analitzen tres unitats lèxiques de la llengua anglesa: les preposicions AT, ON i IN. Quant a la sintaxi es fa palesa la seua varietat d'usos i es confirma la tesi del continu entre lèxic i gramàtica, en comprovar-se que no es poden categoritzar homogèniament d'acord amb una sèrie de trets necessaris i suficients. Quant a la semàntica, es presenta un model de polisèmia basat en la categorització per prototips i les categories radials. Es mostra que el significat de cada unitat lèxica és present a tots els seus usos sintàctics. Tanmateix, no és aquest un significat unitari, puix hi ha polisèmia. En el model de polisèmia que es proposa, cada categoria semàntica té el seu origen en un esquema conceptual, el qual no precedeix necessàriament als altres sentits en el desenvolupament ontogenètic i es constitueix en base a tres dimensions de la percepció: topologia, dinàmica de forces i funció, tal i com les percebem els éssers humans en les reclacions entre objectes. De l'esquema conceptual es deriven altres sentits per sanció parcial d'una o més d'aquestes dimensions. Cada derivació pot originar nous sentits metafòrics en projectar-se el significat a dominis abstractes. Concretament, AT es desenvolupa a partir d'un esquema conceptual d'ENCONTRE – contigüitat, eix horitzontal-frontal del moviment, més funció operativa del trajector sobre el landmark; la categoria ON s'estén a partir d'un esquema de SUPORT – contacte, eix vertical-cap-avall del moviment, més la funció de control del *trajector* sobre el *landmark*; finalment, IN s'estén a partir d'un esquema de CLOENDA – inclusió, eix de fora-endins del moviment, més funció de control del *landmark* sobre el *trajector*. L'anàlisi quantitativa mostra que els prototips no sempre coincideixen amb els esquemes conceptuals. Per a AT són prototípics els usos de contigüitat, per a ON aquells que indiquen suport, y per a IN n'hi ha dos, un d'inclusió i un altre de MEDIUM, els quals focalitzen el sentit respectivament en els contorns i l'interior de l'esquema de imatge del CONTENIDOR.

Resumen:

En esta tesis se analizan tres unidades léxicas de la lengua inglesa: las preposiciones AT, ON e IN. En cuanto a la sintaxis se constata su variedad de usos y se confirma la tesis del continuo entre léxico y gramática, al comprobarse que no se pueden categorizar de manera homogénea según una serie de rasgos necesarios y suficientes. En cuanto a la semántica se presenta un modelo de polisemia basado en la categorización por prototipos y las categorias radiales. Se prueba que el significado de cada unidad léxica está presente en todos sus usos sintácticos. Sin embargo, no es un significado unitario. Existe polisemia. En el modelo de polisemia propuesto, cada categoria semántica se origina en un esquema conceptual, que no necesariamente precede en la ontogénesis al resto de los sentidos, y que se constituye sobre tres dimensiones perceptivas: la topología, la dinámica de fuerzas y la función, tal y como los humanos las perciben en las relaciones entre objetos. De este esquema conceptual se derivan otros sentidos por sanción parcial de una o más de estas dimensiones. Cada nueva derivación puede originar sentidos metafóricos al proyectarse el significado a dominios abstractos. En concreto, el significado de AT se desarrolla a partir de un esquema conceptual de ENCUENTRO – contigüidad, eje horizontal-frontal del movimiento más función operativa del *trajector* sobre el *landmark*; el de ON sobre un esquema de SOPORTE – contacto, eje vertical-hacia-abajo del movimiento más función de control del *trajector* sobre el *landmark* ; y finalmente, el de IN, sobre un esquema de CLAUSURA – inclusión, eje fuera-adentro más función de control del *landmark* sobre el *trajector*. El análisis cuantitativo muestra que los prototipos no siempre coinciden con los esquemas conceptuales. Para AT son prototípicos los usos que marcan contigüidad, para ON los que marcan soporte, y para IN se dan dos prototipos, uno de inclusión y otro de MEDIUM, que focalizan el sentido respectivamente en los contornos y en el interior del esquema de imagen del CONTENEDOR.